

## TECHNICAL ANALYSIS

GENWAL COAL COMPANY, INC.  
Crandall Canyon Property  
PRO/015/032, Emery County, Utah

### UMC 817.1 Introduction and Scope

The Genwal Coal Company, Inc., of Orangeville, Utah, has submitted an underground mining and reclamation permit application for the Crandall Canyon Mine in Emery County, Utah, in compliance with the Coal Mining and Reclamation Permanent Program (Chapter I) of the State of Utah, promulgated under UCA 40-10-1 et seq. This application was originally submitted on December 17, 1980. A final submittal of data was made on August 3, 1982.

The facilities under review are located in the SW1/4 of the NW1/4 of Section 5, and the SE1/4 of the NE1/4 of Section 6 in Township 16 South, Range 6 East, SLM. This is within the confines of Crandall Canyon, a 6.1 mile long westward trending extension from Huntington Canyon in Emery County, Utah. The area is reached taking State Highway 31 northeast from the town of Huntington, approximately 13 miles and making a left turn up a Forest Service development/access road @ 1.5 miles. The 80-acre site comprises Federal Coal Lease SL-062648.

Crandall Creek parallels the southeastern side of the mine plan area and flows in a northeasterly direction into Huntington Creek. Huntington Creek merges with Ferron Creek and forms the San Rafael River which is a tributary of the Green River. Coal mining activities have taken place in Crandall Canyon but only on a small scale during the early twentieth century. The new proposal includes entering some of these old workings (old Tip Top Mine) and mining two seams of coal. The proposed surface facilities include a temporary trailer office, a power generator and fuel storage area, an open conveyor belt system, two open coal storage stockpiles, two vehicle parking areas, a haul truck loop turnaround and associated sedimentation control structures. Portable toilets will be used and some shop and office areas may be constructed underground at a future date. The operation will employ a project workforce of approximately 12-15 individuals. Due to limited reserves, the life of the project is only five years and the total surface disturbance will be 9.7 acres.

Access to the site has proved to be a major factor in its development. Considerable cooperation and planning has been necessary with the U. S. Forest Service who wish to maintain and manage complete access through the site to the upper reaches of the canyon after termination of mining operations. The road has been designated as a Forest Development Road and hence, is not a public road. However, it may be used by the public, although usage is entirely subject to Forest Service discretion.

An Environmental Assessment for the proposed mining operation was completed by the U. S. Forest Service on January 29, 1982. The alternative suggesting approval of the operation proposed with mitigations was selected. The Utah Divisions of Water Rights and Wildlife Resources have offered their suggestions and concurrence for the project. The Utah Department of Health has issued a construction permit for the facilities of their concern. Also, the U. S. Fish and Wildlife Service has had its comments incorporated into the review. A public hearing was held on June 1, 1981 in Huntington, Utah, to determine if there were any adverse comments on the proposed action of construction of an access bridge across Huntington Creek to the site from Highway 31. There were no substantial objections voiced. An archeological and paleontological inventory was conducted in June of 1980. Only one site was found and recommended as significant. It was fenced and is located on Forest Service land near the mouth of the canyon. The mine plan application was determined complete on March 11, 1982 by the Division of Oil, Gas and Mining. Public notification was given by publication in the newspaper on March 31, 1982.

#### Existing Environment and Operations

Crandall Canyon is a west bank tributary of Huntington Creek, one of the major drainages of the Wasatch Plateau, Utah. Elevations in the area range from 7,500 feet in the canyon bottoms to over 10,000 feet on the ridges and plateaus. The canyon is rugged and steep-sided with slopes that are convex and medium in length. They are considered as a rocky outcrop complex with colluvial soils on the slopes and alluvium in the bottom. Vegetation consists of quaking aspen, pinyon pine and Douglas fir on the south side of the canyon and pinyon-juniper and mountain mahogany on the north. Salina wildrye and bluebunch wheatgrass dominate in the understory. Average precipitation is 20 to 23 inches (USGS, WSP-2068, 1981); mean annual air temperature is 38 to 42 degrees F. Crandall Creek is a perennial fresh-water stream. Construction and enlargement of the access road across Forest Service land has already been undertaken through a special use permit up to the boundary of the mine permit area (Station 67+00).

#### UMC 817.11 Signs and Markers

##### Applicant's Proposal

Signs showing the name, business address and telephone number of the person who conducts underground coal mining activities and the identification number of the current regulatory program permit authorizing underground coal mining activities, will be posted at access points from public roads. The signs will be maintained until after the release of all bonds for the permit area (Original Submittal, Section 3.3.5.1, page 28).

Mine portals, electrical equipment, fuel storage areas and explosive storage areas will be posted with warning signs (Original Submittal, Section 3.3.5.1, page 28).

Blasting signs will be used in accordance with UMC 817.11(f)(1-2) (ACR Response, September 1981, page 22).

Buffer zone markers will be used along Crandall Creek as required by UMC 817.57 (ACR Response, September 1981, page 32-33).

Compliance

The applicant has adequately satisfied the requirements of this regulation.

Stipulation

None.

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

Applicant's Proposal

The applicant has not drilled or is not aware of any exploration holes, boreholes, shafts or wells on the property. Therefore, no plans for sealing such have been submitted. Temporary sealing of the portals, if needed, will be accomplished by the construction of protective barricades or other covering devices, fenced and posted with signs indicating the hazardous nature of the opening. Permanent closure plans will include sealing the portals as per the request of the Minerals Management Service (see UMC 817.132).

Compliance

The applicant has sufficiently responded to this regulation and the requirements thereof.

Stipulation

None.

UMC 817.21-.25 Topsoil

The area of disturbance is found at an elevation of approximately 7,500 - 8,000 feet on a southern exposure with slopes ranging from 5-70 percent. The soils have formed from the weathering of sandstone and shale, and are classified as Entisols and Mollisols.

The Entisols are shallow and found on the steeper slopes and have a high erosion hazard. The Mollisols are found on more moderate slopes. They are deep, well drained soils with an A horizon ranging from 8-32 inches thick and have an erosion hazard that is moderate to low. The mean annual soil temperature is 40-44° F and the average annual precipitation is 20-23 inches per year.

The Entisols are classified as poor for the recoverability of topsoil due to the steepness of slope (50-70 percent) and the high percent of large rocks on and in the surface layer (35 to 60 percent). Recovery of topsoil from these areas would be difficult if not impossible. The map unit of these soils is DPH2-Doney Varient-Podo rock outcrop complex, 50-70 percent slopes, eroded.

The Mollisols generally have a deep, well formed A horizon. These soils in general can produce large amounts of topsoil and subsoil that can be removed, stockpiled and used as a good growth medium for reclamation.

#### Applicant's Proposal

**Soil Removal and Storage:** Topsoil will be removed in a separate layer from all areas subject to surface disturbance except for Map Unit DPH2. The removal of topsoil from these areas is restricted due to steep slopes and high percent of large rocks present in the soil profile. The subsoil from the JDE Map Unit will be used as a topsoil substitute for reclamation of the steep rocky slopes associated with the PPH2 soils. The stripping operation will take place after the removal of vegetative cover and prior to the actual surface disturbance by the use of a small track mounted front-end loader and dozer (D-6 or equivalent). All topsoil handling will be conducted under the supervision of a qualified individual.

The topsoil will be placed on a stable surface within the permit area and protected from erosion, compaction and contamination. A berm will be constructed to protect against topsoil loss until an approved vegetative cover can be established.

**Soil Redistribution and Stabilization:** before the topsoil is redistributed, the area of disturbance will be regraded and treated as required by the Division to lessen the chance of slippage and promote root growth. The topsoil will be redistributed with a small front-end loader and dozer (D-6 or equivalent). A qualified individual will monitor the topsoil replacement to insure an even thickness of 0.75 feet will be achieved.

**Soil Preparation:** the topsoil stockpile will be sampled prior to redistribution. Six auger samples will be taken; two from the top 1/3, two from the middle 1/3 and two from the lower 1/3. All lab work will be conducted by a qualified laboratory using methods approved by the Division.

#### Compliance

The applicant will be in compliance when the following stipulation is met.

### Stipulation

1. After examining the soil survey and chemical analysis for a proposed topsoil substitute, one requirement is in order. The B horizon of the TCR soil should be salvaged and stockpiled along with that from the JDE. This will insure that an adequate supply of plant growth medium will be available for reclamation of the steep slopes of 50 to 70 percent. A six-inch layer of topsoil on steep slopes may be lost to erosion and require replacement. The additional soil material from the TCR soil will afford the operator enough material if the need arises.

### Description of the Existing Hydrologic Environment

The Crandall Canyon Minesite is situated within the narrow confines of Crandall Canyon, a 6.1 mile long southwest trending tributary of the extensive Huntington Creek drainage (Wasatch Plateau region, central Utah). The new proposal includes entering some abandoned workings (old Tip Top Mine). This mine was abandoned during the 1940's or 1950's. Crandall Creek is a small perennial stream which parallels the southern boundary of the mine plan area and it flows in a northeasterly direction into Huntington Creek (1.5 miles downstream).

Elevations in the general area range from 7,500 feet in the canyon bottoms to over 10,000 feet on the ridges and plateaus. The minesite is located on a southeast facing slope between 7,750-7,900 feet.

The canyon is rugged and steep-sided with convex slopes classified as a rocky outcrop complex with colluvial soils on the slopes and alluvium in the canyon bottoms. Vegetation is as described under Technical Analysis (TA) sections UMC 817.111-.117. Precipitation averages 20-23 inches annually with the predominant amount occurring as winter snowfall.

The background water quality of Crandall Creek is very good and can be classified as a calcium-magnesium-bicarbonate (Ca Mg HCO<sub>3</sub>) type. Total dissolved solids values range between 250-300 milligrams/liter (USGS water records for Crandall Creek gaging station).

Stream flow varies seasonally attaining peak discharge during the spring snowmelt period and a low during the late fall and winter months. Typically, annual flow may range between 0.5 cfs to over 50 cfs.

The perennial base flow of the stream is attributable to springs which discharge to the stream channel predominantly in the upper reaches of the Crandall Creek drainage. The significant springs are located upstream a substantial distance from the proposed minesite. Crandall Creek is perennial in some reaches, but is sometimes dry in other areas during periods of base flow.

Springs throughout the area appear to be surfacing primarily above and below the Blackhawk Formation. Most significant springs usually discharge from the North Horn, Castle Gate or the Blackhawk/Star Point (interphase boundary) formations. Field observations in mines located in the San Rafael and Price River Basins have shown only limited amounts of subsurface water in the Blackhawk Formation.

The U. S. Geological Survey has published an open-file report (#81-539) which describes the hydrology of the coal resource areas of the upper Huntington Creek and Cottonwood drainages. Much of the information and conclusions of this report may be applicable to the Crandall Canyon drainage area.

The report identifies snowmelt as the major source of ground water recharge for the region. Much of this recharge is discharged from springs which issue from water-bearing zones above the Star Point/Blackhawk (interface) aquifer close to the original recharge areas.

Regionally, there are significant springs which discharge from the Blackhawk Formation. These springs are usually associated with major fault patterns. Ground water can move readily through fractures in faulted areas. Several underground mines in the area which are associated with significant fractures or fault systems have intercepted substantial inflows of ground water (Deer Creek, Wilberg, Star Point and the King mines).

The Crandall Canyon Minesite appears to have a limited recharge area. It is somewhat isolated from one of the more extensive local recharge areas identified as East Mountain. It is located to the northeast of East Mountain on a narrow-ridged, lateral offshoot from this major recharge area.

Surface recharge to the geologic formations in the mine plan area is also limited by the local dissection on the north, south and east by the respective Blind Canyon, Crandall Canyon and Huntington Canyon drainages. The narrow topped ridge and steep slopes of the canyon drainages tend to limit the amount of direct recharge to the formations.

#### UMC 817.41 Hydrologic Balance: General Requirements

##### Applicant's Proposal

The applicant proposes to control surface runoff from the disturbed and undisturbed areas by utilizing a combination of structures; i.e., diversion channels, culverts and sedimentation ponds. Runoff from disturbed areas will be routed through the sedimentation pond. Undisturbed drainage will bypass the operation via a temporary diversion.

Any impacts of the mining operation on the surface water system will be determined through implementation of the surface water monitoring plan and analysis of the data collected. All discharges to receiving waters must be in compliance with all applicable State and Federal water quality regulations and effluent limitations.

The applicant has presented a detailed subsidence control plan to minimize impacts to the hydrologic balance in the immediate and adjacent areas (Item P, Subsidence Control Plan, Coal Systems, Inc., September 16, 1981 submission). No unplanned subsidence is proposed for a minimum distance of 200 feet from the center line of Crandall Creek.

Genwal will minimize changes or impacts to the hydrologic balance by controlling channel velocities, riprapping appropriate channel sections, providing contemporaneous revegetation and by preventing acid- or toxic-forming materials from contaminating the hydrologic system.

#### Compliance

The applicant's proposal will meet the general requirements for this section when the stipulations in the following sections are met.

#### UMC 817.42 Water Quality Standards Effluent Limitations

##### Applicant's Proposal

The applicant proposes to meet water quality standards and effluent limitations by routing and containing surface drainage from all disturbed areas in a sedimentation pond.

Discharges from the minesite will be in compliance with all applicable State and Federal water quality standards for effluent limitations. A NPDES discharge permit will be obtained to cover discharges from the sedimentation pond and for any unpredicted ground water inflows which may result in a discharge from the mine.

The applicant proposes to haul in water for mine operations and store it underground within the mine. Interception of ground water is not projected by the applicant and hence, no discharges are expected to occur from the mine. Any unpredicted ground-water inflow which might occur during mining operations will be pumped to a settling basin in a section of the old workings. The water will be treated for removal of oil and grease and will not be discharged from the mine until it meets effluent limitations.

#### Compliance

The proposal will be in compliance with this section.

#### Stipulations

None, see ground-water section UMC 817.52, this document.

UMC 817.43 Diversions and Conveyance of Overland Flow and Ephemeral Streams

Applicant's Proposal

Several temporary diversions will be constructed at the Crandall Canyon Minesite to bypass drainage from undisturbed areas around the disturbed area and to direct runoff from the disturbed area to the sedimentation pond. A 42-inch culvert will divert a portion of the undisturbed drainage under the topsoil stockpile (see Map #G01-C-016 for detail).

The applicant computed peak flows from the contributing watershed areas by utilizing the Rational Method and the Soil Conservation Service Tabular Method-Composite Hydrograph (SCS TR-55, 1975). The TR-55 method was used to size the 42-inch bypass culvert and to estimate peak flow from the 100-year, 24-hour storm for the Crandall Creek drainage.

The Rational Method ( $Q = CIA$ ) was utilized to determine the peak flow for the 10-year, 24-hour and 25-year, 1-hour storm for sizing of the remaining undisturbed and disturbed area diversion ditches.

Storm rainfall depths for selected durations and return periods were obtained from precipitation records contained in the NOAA Atlas.

The temporary diversions are designed to be triangular or trapezoidal in cross-section. The sizing dimensions were generated from use of the Manning's equation ( $Q = 149/n [S^{1/2} R^{2/3} A]$ ).

The majority of the storm runoff from the 84-acre undisturbed watershed area located above the proposed minesite (north) will flow downslope via a natural ephemeral drainage course and enter a 42-inch culvert running under the topsoil stockpile. The culvert will have a preformed metal end inlet section and a precast energy and velocity dissipating drop structure at the outlet. After exiting this drop structure and prior to discharge into Crandall Creek, a series of three check dams (logs and riprap) will be incorporated to further reduce the flow to nonerosive velocities (see detail sheet G01-C-023).

Two triangular ditches will be constructed just above the upper and lower portal areas to carry runoff from undisturbed areas. The lower ditch will trend in an eastward direction on a mild (2 percent slope) gradient. The upper portal ditch will trend in a southwestward direction at the same gradient. Approximately 10 acres (conservative) of undisturbed drainage will be intercepted by these ditches. The runoff will be directed to the east and west around the disturbed area. To the west, the flow will enter the 42-inch culvert described above. To the east, the flow will be directed into an 18-inch culvert which will carry the runoff downslope through a precast concrete box energy dissipator into the access/haul road drainage ditches (see detail sheets G01-C-016, -024).

The main access/haul road will have a drainage ditch and berm along the outside of the road proper. The ditch will consist of an 18-inch half-round culvert set below the surface course into the subgrade. A series of four (4), 24-inch cross-under culverts will be utilized to bypass the drainage from the surface facilities areas under the main access/haul road and into the sedimentation pond.

The two (2) portal access roads will have typical V-shaped drainage ditches and a total of two (2), 18-inch cross-under culverts to handle drainage from the portal areas. Drainage from the portal areas and portal access roads combines with the drainage from the lower loadout and coal stockpiling areas and drains into the sedimentation pond (see drainage detail sheet G01-C-016).

The 42-inch bypass culvert is sized to handle the runoff from the 10-year, 24-hour storm (@ 40 cfs) with a HW/D of less than one. It will also handle the storm runoff from the 25-year, 24-hour storm (@ 69 cfs; Division calculations) with a HW/D of less than 1.5. For calculations, see "Final" design calculations, Boyle Engineering Corporation, received August 4, 1982.

The undisturbed and disturbed area diversion ditches and culverts are designed to pass the peak flow from the 25-year, 1-hour storm event. This event was selected as the rainfall intensity is larger than from the corresponding 10-year, 24-hour storm (applying rational method).

The diversion ditches will be oversized somewhat and will be able to handle discharges in excess of the necessary design requirements. Adequate freeboard is also provided by the designs (see calculations, pages 11-17, Section UMC 817.43, ACR/DOC Response, December 22, 1981; see design sheets G01-C-007, -016, -024).

#### Compliance

The Division's calculations show that the applicant has overdesigned in most instances. Therefore, the applicant's proposal is in compliance with this section.

#### Stipulations

None.

#### UMC 817.44 Stream Channel Diversions

##### Applicant's Proposal

There are no stream channel diversions planned for this mining project other than the 42-inch culvert and the ephemeral drainage described in Section 817.43 above.

However, the applicant has proposed to provide channel embankment armoring (riprap) for those embankment sections along Crandall Creek where cut and fill slopes may encroach upon the stream channel.

The U. S. Forest Service (USFS) has required that the applicant provide adequate armoring on all stream embankment slopes where necessary to ensure that the 100-year, 24-hour runoff event is safely handled in a nonerosive manner.

The applicant has calculated the discharge and armoring height necessary to comply with the USFS requirement. These calculations are contained in the "Final" design calculations, Boyle Engineering Corporation, August 4, 1982. For typical design of armoring, see detail sheet G01-C-003.

### Compliance

The applicant's proposal depicts cut and fill embankment slopes that will meet the minimum requirements of stability for this section (i.e., 1.5:1; see detail sheet G01-C-016). However, this minimum design slope would generally apply to an embankment in an unsaturated, stabilized condition. Therefore, the Division agrees with the USFS that those areas of road embankment fill material encroaching upon Crandall Creek must be adequately protected from erosion and scour.

It is the Division's opinion that the design calculations should be adequate to meet the USFS requirement. However, it is not clear how the applicant generated the "typical channel section" on page 2 of the "Final" design calculations, and how the channel slopes were derived. It is assumed that these figures were generated from a topographic map of sufficient scale for the specific drainage area.

The applicant's proposal meets the minimum requirements of this section. With regard to the USFS requirement for ample embankment protection, the Division requests a map delineating all those sections of embankment slopes where erosion protection measures will be implemented. This map should also delineate the surveyed and staked limits of where the actual excavated fill outslopes will encroach upon the stream channel.

### Stipulations

1. The applicant shall provide a topographic map which depicts all sections of road and channel embankment fills where erosion protection measures will be utilized (i.e., 100-year, 24-hour armored sections). The actual surveyed outslope limits must also be shown on the map. This map must be received within 30 days after final permit approval.

## UMC 817.45 Sediment Control Measures

### Applicant's Proposal

The disturbed area runoff will be controlled and excess sediment contributions to the receiving waters minimized through the use of several methods including: proper site grading and drainage establishment; sedimentation ponds; contemporaneous revegetation of extraneous area disturbed consequential to construction activities (i.e., embankment out-slopes, fills, topsoil stockpiles, etc.); riprap protection and other energy-dissipating devices to be used in those areas where erosive runoff velocities may occur. For specifics, refer to Sections UMC 817.43, .44, .47, .52 of this document.

### Compliance

The applicant's proposal meets the minimum requirements of this section.

### Stipulations

None.

## UMC 817.46 Sedimentation Ponds

### Applicant's Proposal

Drainage from the disturbed area at the minesite will be directed into a sedimentation pond. The pond is to be constructed just above and adjacent to the Crandall Creek drainage, at the lower southeastern end of the minesite area (see detail sheet G01-C-016).

The applicant has used the SCS TR-55 method and the Universal Soil Loss Equation (USLE) for pond design specifications. A weighted curve number (CN) approach was used in computing the sediment loss rate and the runoff volume. A synthetic hydrograph was also generated which computed the peak inflow and outflow for the impoundment (see "Final" design calculations, Boyle Engineering Corporation, received August 4, 1982).

The pond is designed to handle the runoff volume for the 10-year, 24-hour precipitation event (2.4 inches, NOAA Atlas). The volume of runoff from the 8.36 acre contributing disturbed area was determined to be 33,400 cubic feet or 0.77 acre-feet. The three-year sediment yield was estimated to be approximately 478 tons, 13,000 cubic feet or 0.30 acre-feet.

The inlet to the pond will be a defined, riprapped channel from the outlet of the inlet culvert to the bottom of the pond (see design sheets G01-C-022). The ponds is provided with a 24-inch principal spillway (galvanized steel culvert with oil skimming device and trash rack). The pond will also have a riprapped emergency overflow spillway to handle the calculated design flow

generated by the 25-year, 24-hour storm (see detail sheets G01-C-020, -021, -022). The design calculations are provided in the "Final" design calculations, Boyle Engineering Corporation, received August 4, 1982. The emergency spillway channel will be riprapped the entire length to the interception with Crandall Creek.

The outlet from the principal spillway will also be riprapped to the stream channel. A continuous, gradual, sediment-dewatering device is proposed for the pond. This will consist of a six-inch perforated PVC pipe which will be wrapped in a filter cloth and emplaced in a shallow gravelled trench extending up the pond inslope to the approximate maximum sediment storage level. This pipe will be connected to the base of the 24-inch principal discharge pipe and grouted in place (see detail sheet G01-C-020, -021).

The principal discharge pipe will also be fitted with an emergency dewatering device (Waterman C-7 Shear Gate or equivalent, G01-C-021). The pond will be lined with 18 inches of impervious clay to preclude seepage. Sheet G01-C-021 appears to indicate that at least two cutoff collars will be installed around the 12-inch principal outlet pipe.

A 12-foot wide maintenance road is proposed for occasional access to the pond. All exposed inslope and outslope embankments will be revegetated contemporaneously.

The upstream and downstream embankment slopes are designed at 1.5h:1v and 2h:1v, respectively (see G01-C-020, -021).

#### Compliance

Due to the physically confining topographic constraints of the canyon, the proposed sedimentation pond does not meet the regulatory requirement of a minimum 1v:5h combined upstream and downstream side slopes for the settled embankment. However, the applicant has submitted a geotechnical slope stability analysis for the pond which designates stability for the embankment slopes at a minimum 2H:1V downstream and 1.5H:1V upstream design. The factor of safety is 1.54 under static conditions and 1.314 under seismic conditions. The STABL2 computer program was utilized for stability analysis (see R & M Consultants, Inc., Embankment Slope Stability Study for Sedimentation Pond Stability, March 30, 1982).

It is the Division's opinion that the results of this stability analysis would support the justification for a reduction in the combined 5H:1V slope requirement for the pond embankment. Therefore, the applicant's proposal would be in compliance with UMC 817.45(m).

It is the Division's opinion that the applicant has underestimated the three-year sediment storage volume. The R factor used in the USLE seems somewhat low (20). A value of 30 would be more appropriate as this number includes an often neglected subfactor (Rs), which takes into account erosional losses attributable to snowmelt, thaw and/or light rain on frozen soil during spring runoff (for discussion and application, see Section 5.3.1.1, pages 5.12-5.16, OSM Technical Hydrology and Sedimentology Reference Manual, March 1981).

It was also noted that the applicant's "Final" design calculations do not provide for any sediment losses from the gravelled access roads or parking lots. These areas drain to the sedimentation pond and constitute 2.58 acres of disturbance.

Not accounting for this last area of potential sediment production (i.e., roads), the Division calculates a three-year sediment storage volume of 19,378 cubic feet, 717 tons, or 0.44 acre-feet. This would increase the total required storage volume to 52,778 cubic feet.

However, since the three-year sediment storage volume requirement has been suspended for revision, the Division feels that a two-year sediment storage volume is adequate (i.e., 13,000 cubic feet as provided) to comply with this section.

The Division agrees with a recommendation from the Utah State Water Rights Engineer's Office that the operator provide a cut-off collar around the nonperforated section of the sediment dewatering device in addition to the principal spillway outlet pipe.

Also, the operator should be prepared to replace the cloth filter on the sediment dewatering device, as they are prevalent to frequent clogging with fine sediments.

The applicant is reminded that the final constructed design of the sedimentation pond must be certified by a registered professional engineer after construction is complete (UMC 817.46[r]).

The applicant's proposal is in compliance with all other requirements of this section.

#### Stipulations

1. The operator must provide at least one cut-off collar for both the sediment dewatering device and the principal spillway outlet pipe in the final construction design.
2. The operator must ensure that the embankment outslopes will not be constructed within the confines of the active stream channel of Crandall Creek.

3. Those slopes located within the 100-year, 24-hour flood plain must be adequately protected with riprap, revetment retaining walls, or by other suitable standard engineering practices (see TA, Section UMC 817.44, Stipulation #1). The final engineering designs for control of erosion of the embankment outslopes must be approved by the USFS and the Division prior to construction.

#### UMC 817.47 Discharge Structures

##### Applicant's Proposal

The applicant proposes to use a combination of engineering techniques to control discharges from the sedimentation ponds, diversions, ditches, berms and culverts.

Energy and erosion controls to be utilized include:

1. Riprapping, as necessary, for specified channels, culvert inlets and/or outlets, embankments, and spillway outlets.
2. Preformed culvert metal end sections.
3. Precast concrete drop box energy dissipators.
4. Stilling basins and/or check dams.

Specific design details are presented on sheets G01-C-007, -016, -023 and -024.

##### Compliance

The applicant's proposal complies with the general requirements of this section.

##### Stipulations

None.

#### UMC 817.48 Acid-forming and Toxic-forming Materials

##### Applicant's Proposal

The applicant has provided the results of chemical analyses for overburden and samples on pages 1-6, Section UMC 783.14 (DOC response, December 22, 1981) of the MRP supplemental documents.

Compliance

The applicant's proposal has not identified the presence of acid- or toxic-forming materials that would warrant the protective measures required by this section, nor have such materials been encountered at other coal mines in the region. The proposal is in compliance with this section.

Stipulations

None.

UMC 817.49 Permanent and Temporary Impoundments

Applicant's Proposal

No permanent impoundments are proposed for the mining operation.

Only one temporary impoundment (sediment pond) is proposed for the life of the mine. As demonstrated in the previous sections, the impoundment will meet the general requirements of Section UMC 817.45(e)-(u).

The impoundment does not meet the size or other criteria of 30 CFR 77.216(a) so these provisions do not apply. Embankments slopes will be stabilized via a combination of vegetation and riprap where necessary.

Compliance

The applicant's proposal meets the general requirements of this section.

Stipulations

None.

UMC 817.50 Underground Mine Entry and Access Discharges

Applicant's Proposal

The applicant does not expect the mine to intercept ground water of sufficient volume to necessitate a surface discharge.

Should any ground water occur during operations, it will be pumped to a settling basin in an inactive underground mine area and treatment measures will be provided to ensure compliance with all State and/or Federal effluent limitations (see Section UMC 817.43, page 7, response to "Draft Technical Deficiencies Document," June 1, 1982).

Compliance

The applicant's proposal meets the general requirements of this section.

## Stipulations

None.

## UMC 817.52 Surface and Ground Water Monitoring

### Applicant's Proposal (Surface Water)

The applicant has provided USGS surface water flow and quality data for Crandall Canyon Creek to establish baseline conditions for this area (see section UMC 783.16, items M and N, "Response to ACR Review," September 1981).

The applicant has indicated on an enclosed map (#5, ACR Response, September 1981), the proposed locations for the stream monitoring stations to be installed above and below the proposed disturbed area. The monitoring stations will consist of a combination Parshall flume, Crest stage gage and single stage sediment sampler.

The detailed designs for the surface water monitoring stations to be installed on Crandall Creek are attached to the discussion provided under section UMC 783.16/817.52 (pages 8, 8A, 8B, response to "Draft Technical Deficiencies," June 1, 1982). After the stations are installed, they will be surveyed, the exact locations plotted on a map and copies sent to the Division to update the MRP on file.

The applicant has outlined a monitoring plan for operational and postmining conditions in accordance with the recommendations provided in the Division's Guidelines for the Establishment of Surface and Ground Water Monitoring Program" (for specifics see "ACR Response Document," pages 6-10, September 1981).

Any effluents discharged from the sedimentation pond to Crandall Creek will be in accordance with the conditions of the approved EPA-NPDES discharge permit.

## Compliance

The applicant's proposal for surface water monitoring, would, under less critical operational and spacial constraints, be adequate to meet the general requirements of this section. However, due to the confining nature of Crandall Canyon at the minesite versus the planned extent of surface development for this proposal, it is the Division's opinion that a more intensive surface water monitoring plan should be implmented during the operational phase.

The monitoring plan for at least the first year of active operation should be structured to provide additional sampling according to the following recommendations:

- A. Applicant should implement the specifics as outlined above in the proposed plan for monitoring during the operational phase..
- B. Additional sampling for TDS, TSS, pH, EC and water temperature should be monitored on a monthly basis.

The applicant's proposal will comply with the requirements of this section when the following stipulations are met.

#### Stipulations

1. The applicant will need to modify the proposed surface water monitoring plan to meet the following provisions:
  - A. Implement the specifics as outlined in the proposed plan for monitoring during the operational phase.
  - B. Additional sampling for TDS, TSS, pH, EC and water temperature on a monthly basis (minimum of one year).

#### Applicant's Proposal (Ground Water)

The applicant's latest proposal for ground-water monitoring outlined in Genwal's response to the "Draft Technical Deficiency Document," received June 1, 1982, pages 1-5, 7 and 8. The proposal can be summarized as follows:

The applicant has referenced and included several excerpts from the ground water hydrologic sections of the MRP's for a number of existing coal mines within the area (Beaver Creek Coal Company--Huntington #4 Mine; Utah Power & Light Company--Deer Creek and Wilberg mines).

The applicant states that field work indicates there is no faulting within the mine permit area. The formations dip an average of 3°N, northwest into the trough of the "Crandall Canyon Syncline."

The applicant has identified at least one spring that is located on the same side of the canyon as the minesite area and approximately 200 yards upstream and west of the confluence with the east branch of Crandall Creek (@ 0.1 mile west of the minesite) (see Map #13, "ACR Response Document," September 1981).

The spring is located down dip from the mine toward the Crandall Canyon Syncline and could be impacted by the mine operations if an interconnection exists between the two and if ground water is intercepted by the mine.

The applicant proposes not to monitor the spring until such time as ground water occurs within the mine. the appliant states that the old abandoned workings which form part of the lease (Hiawatha Seam) are dry.

The applicant has committed to make and submit the results of a spring and seep survey for the 1982 season (page 4, "ACR Response," September 1981) for the mine permit area. The applicant also has committed to monitor significant inflows of ground water if intercepted during the course of mining (pages 5, 7, Draft Technical Deficiency response, June 1, 1982). Inflows will be monitored and sampled bimonthly (every two months) for flow and quarterly for quality. Minimal parameters of location, flow rate, EC, pH, TSS, TDS, total iron and total manganese will be determined in the quality analysis.

### Compliance

The applicant's proposal to monitor potential impacts to the spring after the mine intercepts ground water, is not acceptable. This proposal will not establish the baseline seasonal variations for the spring prior to any impact. This information must be established before the mine intercepts any significant ground water inflows. Consequently, the Division requires that baseline flow and quality data be established for the spring during the first year of mine development. Monitoring should continue through the operational and postmining phases as well. It is the Division's opinion that baseline establishment during the first year of operations will provide adequate lead time to determine the natural seasonal variation prior to any adverse mining impact. The rationale for this opinion is based upon the timeframe for underground development, the distance between the mine and the spring, the geologic stratigraphy and structure, the lack of identifiable faults in the area and the small size of the mining lease (@ 80 acres).

The applicant should implement a monitoring plan similar to the recommendations outlined in the Division's "Guidelines for the Establishment of a Surface and Ground Water Monitoring Program."

As of September 23, 1982, the Division had not received the results of the 1982 spring and seep field survey. This information should be provided and incorporated into the applicant's MRP.

The frequency of flow measurement of any significant inflows of ground water that may be intercepted during mining should not be limited to the bimonthly period, as proposed by the applicant. A more comprehensive method to measure the volume of water produced within the mine would be to utilize a continuous recording flow meter(s) on the main sump pumps(s) used to remove and transport any ground water from the working face(s). Weekly records should be kept on-site and summaries submitted to the Division on a quarterly basis.

Quality analyses should be made whenever a significant inflow is intercepted. If the inflow continues for an extended time, then the quality should be monitored at least semi-annually. Minimal chemical and physical parameters, as outlined in the applicant's proposal, will be adequate, although one complete chemical analyses should be made each year.

Stipulations

1. The applicant shall implement a monitoring plan during the first year of operations to establish baseline flow and quality data for the spring upstream of the mining operation (see TA section UMC 817.52 for specifics). The plan must also include provisions for operational and postmining monitoring and be approved by the Division.

This plan must be received by the Division within 30 days after final permit approval and must be approved or implemented prior to the start of actual underground mine development.

2. The applicant must submit the results of the 1982 spring and seep field survey of the mine permit area, as committed to on page 4 of the September 1981 ACR response document. If the survey has identified additional seeps and springs which have not been included in previous submissions, then an updated topographic map must be provided showing the locations of the seeps and springs.

Springs producing measurable flow must be included in the monitoring program outlined by Stipulation #1 of this section.

The results of this survey and any spring additions to the monitoring plan must be received within 30 days after final permit approval.

3. The applicant must commit to the minimum recommendations outlined in the compliance section for monitoring unpredicted ground water inflows during mining operations. This includes the use of continuous recording flow meter(s) on the main sump pump(s) with weekly on-site records and quarterly summaries of flow submitted to the Division. A quality analysis must be made immediately of any significant inflow. If an inflow continues for an extended time, additional analyses must be made semi-annually.

UMC 817.53 Transfer of Wells

Applicant's Proposal

This section is not applicable for permit approval at this time. There are no wells within the mine permit area or adjacent area. The MRP contains no proposals to drill any wells for the life of the mine operation.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.54 Water Rights and Replacement

Applicant's Proposal

The applicant has submitted an application for a "Temporary Change of Point of Diversion, Place or Purpose of Use" to the Utah State Engineer's Office on March 31, 1982. The application was approved and a copy received by the Division on August 11, 1982.

The applicant has purchased the water right to 20 acre-feet of surface flow from the Huntington-Cleveland Irrigation Company. The water is to be diverted from a designated diversion point on Crandall Creek. A copy of a stock certificate is attached to the approved application from the State Engineer's Office.

The water will be used in connection with the construction and operation of the Crandall Canyon Mine.

There are no other appropriated water rights in existence within the mine plan or in the immediate adjacent areas. The applicant's proposal for control and containment of surface runoff and underground discharges will ensure that downstream water user rights will be adequately protected (see TA sections UMC 817.41-.52).

Compliance

The temporary application approval from the State Engineer's Office is to expire on November 30, 1982. Consequently, it will be necessary for the applicant to update the MRP with the final permit approval from the Division of Water Rights.

Also, the MRP does not designate precisely where the diversion point will be located. It is stated in the plan that the location will be on private land. The State application for temporary change does give a legal description as: E 800 ft from the W1/4 cor., Sec. 6, T. 16 S., R. 7 E., SLB&M (Crandall Canyon). However, this location should be indicated on a surface facilities map. A description of the methods and equipment to be utilized to divert the water should also be indicated. Any additional amount of surface disturbance that may be associated with the diversion will need to be addressed for reclamation purposes.

Stipulations

1. The applicant must provide notification of or a copy of the final permit approval from the State Engineer's Office for the change of use and diversion point as soon as it is available to update the MRP.

2. An updated topographic surface facilities map must be provided which identifies the precise location of the approved diversion point and the specific methods and equipment to be utilized to divert the water from the creek. Any increases in surface disturbance that may result from the diversion implementation must be identified.

This map must be provided to the Division within 90 days of the date of final permit approval.

### UMC 817.55 Discharge of Water into an Underground Mine

#### Applicant's Proposal

The applicant proposes to utilize an area of the old abandoned mine workings to store water for underground operational purposes. The water will originate from the approved surface water diversion point on Crandall Creek.

If significant inflows of ground water are intercepted during mining, this water will also be directed to an abandoned section of the old workings for settling and treatment prior to any necessary surface discharge.

Any surface discharges from the mine will be governed by a NPDES discharge permit.

#### Compliance

The applicant's proposal appears to meet most of the general requirements of this section. However, the following provisions must be addressed before the proposal will demonstrate total compliance with UMC 817.55:

- A. Pursuant to UMC 817.55(g), the plan for storage and discharge of water into the underground mine workings must meet with the approval of the Mine Safety and Health Administration (MSHA).

The applicant will need to provide the Division with written verification that the MSHA has approved of these plans prior to actual on-site implementation.

- B. After the MSHA has approved the plans described above, and when the plan(s) are actually implemented by the applicant, an updated underground development map will need to be submitted to the Division to be incorporated into the current MRP.

The map should indicate the general area where the underground water storage and treatment facilities are located. A schematic overview of the methods to be employed which will route the water through the mine working should also be depicted on the map.

Stipulations

1. The applicant must provide written verification that the MSHA has approved the proposal for surface to underground discharge and storage location(s).

The verification must be received by the Division prior to actual on-site implementation of the proposal.

2. The applicant will need to provide an updated underground development map which indicates the general area where the underground water storage and treatment facilities are located, and a schematic overview of the general routing methods employed to transmit waters to the storage/treatment facilities areas.

This map should be received by the Division within a minimum 30 days after the actual implementation of said plan.

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

Applicant's Proposal

This section is not applicable as there will be no permanent hydrologic structures remaining to be renovated at the cessation of mining operations.

Compliance

Applicant is in compliance with this section.

Stipulations

None.

UMC 817.57 Stream Buffer Zones

Applicant's Proposal

The applicant requests authorization to construct surface facilities and conduct surface operations connected with the proposed underground coal mine, within 100 feet of Crandall Creek, a perennial stream (Page 20, DOC Response, December 22, 1981).

The applicant states that no further blasting will be done that might deposit rubble in the creek. Temporary sediment control measures will be utilized which include the use of straw dams similar to those used and approved during access road construction, under the USFS road-use permit during the summer and fall of 1981. Throughout construction activities, the straw dam provided an acceptable job of retaining sediment.

Two more straw dams are proposed for installation in Crandall Creek in the vicinity of stations 71+00 and 79+00. The dams consist of two rows of straw bales laid across the creek with off-set ends. The dams will be built high enough so that the water must flow over the center portion of the dam. After construction is completed, the trapped sediment will be removed and then the bales.

A copy of the plan will be submitted to the State of Utah, Bureau of Water Pollution Control, with a request for a temporary variance to sediment standards during the applicant's construction phase (page 9, response to "Draft Technical Deficiency" document, June 1, 1982).

Embankment erosion control measures will consist of riprapping those sections which will encroach upon Crandall Creek (see drawings, G01-C-003, 016, 017 and 020).

On Page 14-15 of Item P (Subsidence Control Plan, Coal Systems, Inc., received September 16, 1982) it is specified that pillars are to be designed to ensure that no unplanned subsidence should occur within 200 feet of the centerline of Crandall Creek. No mining is proposed under the stream.

On page 32-33 of the ACR response (green binder, September 16, 1982), the applicant states that the area not to be disturbed will be designated a buffer zone and marked as specified in UMC 817.11.

Also on page 20 of the December 1981 DOC response, the applicant states that monitoring of Crandall Creek on a weekly basis during the construction phase will verify the extent of any impact to Crandall Creek water quality.

Applicant will sample for water quality of Crandall Creek weekly for the following parameters: TDS; TSS; pH; EC; and, water temperature.

The two sampling sites will be as follows: (1) above the construction site @ 300 feet upstream from the quarter corner designated as station 2A on the construction drawings; and (2) below the construction disturbance at station 72+50.

Turbidity measurements will also be taken daily at both sampling locations (page 9, Technical Deficiencies Response, June 1982).

On page 58 of the latest DOC response, the applicant commits to the development and implementation of appropriate mitigation plans with the regulatory authority (RA) should stream flow diminish significantly or water quality deteriorate.

Compliance

The applicant's proposal for minimizing and monitoring impacts to the Crandall Creek drainage during construction activities in addition to the detail of operational plans as outlined under Sections UMC 817.41-.56 of the MRP and this document, justify granting a variance to the 100-foot buffer zone requirement of this section. It is the Division's opinion that this proposal is in compliance with this section.

Stipulations

None.

UMC 817.59 Coal Recovery

Applicant's Proposal

The applicant has submitted a detailed sequential description of room and pillar coal development for both seams of coal, the Hiawatha and Blind Canyon seams (see Item P, Subsidence Control Plan, Coal Systems, Inc., September 1981). Upper and lower seam coal removal has been correlated on a yearly calendar sequence and specific panel, main and barrier pillar mining has been coordinated adequately for a 60 month period (see Technical Assessment Deficiency Response, May 25, 1982, pages 9-11). An overall recovery rate of between 60 and 70 percent is anticipated. Drawings 4047-1 and 4047-2 illustrate the mining procedures. The plan has been approved by the Minerals Management Service (MMS letter from Jackson Moffitt, September 24, 1981).

Compliance

The applicant will meet the requirements of this regulation when the following stipulation has been satisfied.

Stipulations

1. The complete Roof Control and the Ventilation, Methane and Dust Control plans approved by Mine Safety and Health Administration (MSHA) are an integral part of the mining and reclamation plans and must be compatible.

The applicant shall submit complete approved copies of these plans to the appropriate agencies (Minerals Management Service, Office of Surface Mining, Division of Oil, Gas and Mining and the County Recorder's Office) as an addendum to the mining and reclamation plan. As these plans are updated and/or changed and approved by MSHA, complete copies of the updated and/or changed parts shall be submitted to update the formal mining and reclamation plan.

UMC 817.61-.68 Use of Explosives

Applicant's Proposal

The applicant has committed to compliance with all State and Federal laws involved with the use of explosives and that all persons conducting blasting operations will be trained, examined and certified as per State and Federal regulations. No surface structures are located within one-half mile of any proposed surface blasting activity. The applicant has committed word-for-word to regulations pertaining to surface blasting requirements listed under UMC 817.65. Seismographic measurements and records of blasting operations (817.67-.68) have been similarly word-for-word, placed into the mine plan permit application as commitments by the operator.

Compliance

The operator complies with these sections.

Stipulation

None.

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

Applicant's Proposal

The applicant's mine development plans have indicated that no underground development waste will exist. If development waste occurs, it will be stored underground (ACR Response, September 1981, page 15). Storage of waste would most likely be in every other cross cut to maintain access to the pillars for final extraction.

Compliance

The applicant will comply with 817.71-.74. However, in the event a rock waste problem is encountered which cannot be adequately handled in underground cross-cuts, the applicant shall consult with regulatory agencies concerning alternative disposal areas. Minimum and maximum MSHA standards concerning coal dust, rock and other dust must be observed as provided for in Title 30, Mineral Resources, Chapter I-MSHA, Subpart E, 75.403.

Stipulations

None.

UMC 817.81-.88, 817.91-.93 Coal Processing Waste

Applicant's Proposal

No coal processing facilities will be used at Genwal's Crandall Canyon mining facility.

Compliance

Applicant will comply with UMC 817.81-.88, 817.91-.93.

Stipulation

None.

UMC 817.89 Disposal of Noncoal Waste

Applicant's Proposal

All noncoal waste will be stored in designated trash bins and hauled from the mine property by American Kinfolk Company, Box 780, Huntington, Utah, and disposed of at their landfill site north of Huntington, Utah (ACR Response, September 1981, page 16 and ACR Response, December 1981, page 37). Waste oil and grease as well as items contaminated with such will be stored in metal containers located in the "Waste Storage" area designated on drawing No. G01-C-016.

Compliance

The applicant complies with this section of the regulations.

Stipulation

None.

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

Applicant's Proposal

This section does not apply as there are no coal processing waste dams or embankments proposed for this operation.

Compliance

The applicant's proposal is in compliance with this section.

Stipulations

None.

UMC 817.95 Air Resources Protection

Applicant's Proposal

Applicant submitted an Air Pollution Control Plan as part of the original MRP submittal, Chapter XI received December 18, 1980. The plan has been approved (with conditions) by the Department of Health letter, July 23, 1980, included in Chapter XI.

Fugitive dust control measures to be used in connection with the Genwal Mine facility are discussed in Chapter XI, pages 5-6 of the MRP.

Compliance

Applicant will comply with the requirements of UMC 817.95.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values

Applicant's Proposal

Crandall Canyon, by the nature of its steep, rugged topography, and its being a major drainage of the Wasatch Plateau, supports many species of vertebrate wildlife, including species of high interest to Federal and State agencies. A golden eagle nest has been located outside of the permit area, approximately 0.8 km to the northeast and above the old (existing) mine portals. In 1980, this nest fledged one young. Its exact status in 1981 and 1982 is not known. The U. S. Fish & Wildlife Service (USFWS) feels that human disturbance may have caused the eagles to forego or abandon a nesting attempt in 1981 (see attached letter dated January 27, 1982). Both ruffed grouse and blue grouse brood and nest in the area of the proposed mine. Black bear, cougar, elk, mule deer and moose are important big game species which inhabit the Crandall Canyon area. Mule deer and elk winter on the high ledges and ridges of the canyon. It is likely that some animals pass through Crandall Canyon to their winter habitat. The mine access road may serve to disrupt big game movements. The applicant feels that the chance of a wildlife-coal truck collision is minimal, given the width of the road and a designated speed of 10 mph (Response to ACR Review, September 1981, page 34). Moose winter in all of the Huntington Canyon drainages, and winter mining activities will impact moose use of the lower 2 km of Crandall Canyon (MRP, Chapter IX, page 52). Crandall Creek, a perennial stream, has been determined not to be a fishery, however, it flows into Huntington Creek, a high quality trout stream. Riparian habitat along Crandall Creek has been and will be further destroyed by roadbuilding activity on and off the permit area.

The applicant will protect wildlife habitat on the permit area by careful design and construction of mining facilities and transportation corridors, keeping surface disturbance to a minimum. The applicant has committed to report to the regulatory authority the presence of any bald or golden eagles or threatened or endangered species located in the permit area. Monitoring of streamflow and water quality in Crandall Creek continues and the applicant has committed to develop mitigation plans in concert with the regulatory authority should streamflow diminish or water quality deteriorate. A mobile generating unit will supply power to the minesite so no power lines will be constructed.

The U. S. Forest Service (USFS), U. S. Fish & Wildlife Service (USFWS) and the Division of Oil, Gas and Mining (DOGM) have requested that riparian habitat be restored along Crandall Creek and Genwal Coal Company has agreed to this request and submitted an appropriate revegetation seed mix. Shrubs will be reseeded over the whole area to enhance the postmining land-use of wildlife habitat. It was suggested by the regulatory authority that the applicant plant shrubs in clumps to enhance wildlife habitat, but the applicant has not committed to this practice at this time (See Section 817.111-.117). The applicant has not committed to avoid persistent pesticides and prevent fires as required by UMC 817.97(d)(7), (8).

The Utah Division of Wildlife Resources (UDWR) has signed off on the MRP with no comments (see attached letter dated April 26, 1982). The USFWS still has some concerns about the MRP (see attached letter dated January 27, 1982), however, these deal with impacts of the road on Crandall Creek and on wildlife migration through the area. Since the majority of the road is outside of the permit area, DOGM has no authority to regulate it. The surface landowner, the USFS, has jurisdiction over the road.

#### Compliance

Applicant will comply when the following stipulation is met.

#### Stipulations

1. The applicant must commit, in writing, to avoid the use of persistent pesticides and to prevent fires. This commitment must be received in writing as a condition to final permit approval.

#### UMC 817.99 Slides and Other Damage

##### Applicant's Proposal

If slide damage occurs within the permit area, the applicant will notify the Division and comply with any remedial measures required.

##### Compliance

The applicant has adequately complied with this section of the regulations.

Stipulation

None.

UMC 817.100 Contemporaneous Reclamation

See Section 817.111-.117.

UMC 817.101-.106 Backfilling and Grading

Applicant's Proposal

All areas affected by surface operations will be graded and restored to a contour that is compatible with natural surroundings. All final grading will be done along the contour to minimize erosion and instability unless this operation becomes hazardous to the equipment operators. Backfilling and grading will proceed so as to eliminate or reduce the highwall (Original Submittal, 3.5.4, page 32).

Backfilling and grading will be done according to the reclamation timetable (Original MRP Submittal, 3.5.6.1, page 34).

Typical cross sections and topographic maps which adequately represent the existing land configuration of the area affected by surface operations are shown on Maps G01-C-017 and -016. Postmining reclamation cross sections and surface topography will be as near to premining as is possible and practical (see "Note," Maps G01-C-017 and -016).

The applicant has acknowledged that the Division will determine the practicality for postmining topography as it should be ultimately implemented (see page 12, Technical Analysis Deficiency Response, May 25, 1982). The applicant has not submitted specific and detailed postmining reclamation cross sections of the surface topography. Based upon Maps G01-C-016 and -017, the Division will determine the adequacy of final efforts which will follow nearly as possible the premining condition.

Compliance

The applicant has complied with these sections.

Stipulation

None.

UMC 817.111-.117 Revegetation

Stipulation

Applicant's Proposal

The proposed Genwal Mine site lies on the north slope of Crandall Canyon approximately 40 meters above Crandall Creek. Five plant community types will be disturbed by mining activities. These are: mountain shrub/grassland; mixed mountain shrub/conifer/aspens; spruce/fir/aspens; riparian; and, an area impacted by previous coal mining (previously disturbed area). A total of 9.7 acres will be disturbed within the permit area of 83.65 acres. Since the road will be left after mining (USFS request), only 8.5 acres will be reclaimed. Baseline data on cover, and shrub and tree densities were collected in all plant community types.

One reference area was set up in the mountain shrub/grassland type above the proposed disturbed area. This will serve as a reference area for all disturbed slopes of 31 percent or more. The reference area was shown to be statistically similar to the mountain shrub/grassland type. The SCS has given an opinion that the reference area is in good or better range condition, based on a site inspection. The applicant has committed to submit written range condition information as soon as it is available.

A seed mix has been developed for this area, made up of native and naturalized grass, forb and shrub species. A standard of 1,336 shrubs per acre, as determined by sampling, has been set. Ground cover in the reference area was found to be 24 percent. A separate seed mix has been proposed for slopes of 30 percent or less. Trees will be planted in this area as well. Disturbance in this area will affect the forested communities: riparian; spruce/fir/aspens; and the previously disturbed community, which was most likely forested prior to disturbance. An area suitable for a reference area for a forested type could not be found within the permit area. Accordingly, revegetation standards for this area have been set as follows: ground cover, productivity figures and shrub density standards from the reference area will be used; tree density standards will be 550 trees per acre, as recommended by the U. S. Forest Service.

Species diversity standards have been established for revegetated areas. These will insure that a good mix of grasses, forbs, shrubs and trees, where appropriate, will be re-established, and that the reclaimed area will not be dominated by one or two species. The applicant has not yet submitted a specific plan for monitoring revegetated areas. A specific configuration for shrub plantings, if required, has not been agreed upon yet. The applicant has committed to protecting revegetated areas and to managing the reference area in a manner compatible with postmining land-use.

The applicant has submitted a complete revegetation plan, including soil preparation, species lists and seeding rates, methods of planting and mulching techniques. The species lists contain species that are native to the area, with one or two introduced species included that have proven value to prevent

erosion, and which are not overly competitive with the native species. Seeding will be done in the fall, and will be done as soon as possible after seed bed preparation to minimize erosion and enhance revegetation potential. A combination of hydro-mulch, cyclone seeding, hand-broadcasting and hand-set planting will insure a permanent plant cover. On slopes of 30 percent or less, a straw mulch of 1 1/2 tons per acre, anchored into the soil by mechanical means, will be used. The steeper slopes will be hydro-mulched with 3/4 ton of wood fiber mulch per acre. Burlap netting may also be used. No attempts at irrigation will be made.

Contemporaneous reclamation will be undertaken following construction. A map (Map No. 5 in the September 16, 1981 ACR response) has been submitted showing areas of contemporaneous and final reclamation. All outslopes of 1:1 or flatter and fill slopes 1 1/2:1 or flatter will be revegetated contemporaneously. A seed mix for stabilizing the topsoil stockpile has been submitted.

#### Compliance

Upon Division receipt of written acceptance to the following stipulations, the applicant will be in compliance with these sections.

#### Stipulations

1. The applicant must submit a detailed plan for monitoring revegetated areas. This must include specific methods for collecting data on cover, productivity and shrub and tree density, as well as a time table for all monitoring activity. The plan must be received within 90 days of the date of final permit approval.
2. Transects will be done the second year after reseeding to determine emergence and survival of shrubs. If shrub density is much lower than the established standards (1,336 shrubs/acre), shrubs will be planted. At such time as the need to plant shrubs becomes evident, the regulatory authority must be consulted to determine density and spacing of plantings.

#### UMC 817.121-.126 Subsidence Control

#### Applicant's Proposal

Coal mining activities have been planned and are consistent with known technology which will prevent subsidence or allow for controlled subsidence that will not cause unpredicted surface changes.

Subsidence has been forecast in four stages: areas of major impact within the 12° positive break line; moderate areas of subsidence based upon extrapolation of calculations taken from data at the Geneva Mine, Utah; moderate to light areas of effects within the remaining area as defined by the angle of draw; and, an area where no subsidence effects should be noticed.

Because of variations in overburden between 400 and 800 feet, subsidence monitoring monuments have been designed to be emplaced in the major impact areas across the surface of the proposed mine. Monuments also are to be emplaced in areas of little or no impact as well as within an area between the proposed mine and Crandall Creek. Movement at these subsidence monument stations should be noticeable within two-three months after caving begins in each seam.

A sequential description of planned coal development has been submitted and forwarded to the Forest Service so that public notice of proposed subsidence effect timing has been addressed.

The applicant has submitted a design from Coal Systems, Inc. (see Item P, September 1981), which details a 200 foot barrier pillar and an additional 150 foot length of 50 percent partial extraction in the proposed mine plan area adjacent to Crandall Creek. This plan adequately addresses concerns which arise from mining adjacent to a perennial stream. Material damage to the stream will not be caused as long as the development plan is implemented by the operator.

#### Compliance

The applicant has satisfied the requirements of these sections.

#### Stipulation

None.

#### UMC 817.131 Cessation of Operations: Temporary

#### Applicant's Proposal

If operations are to be temporarily suspended for 30 days or longer, the applicant will submit a notice of intention to the Division. This notice will include a description of the extent and nature of existing surface and underground disturbance prior to temporary cessation. The statement will also cover the type of reclamation which will have been accomplished to date and also include the type of on-going monitoring, number of opening closures, water treatment activities and other topographic rehabilitative efforts which have been or will be undertaken during this period. The applicant will maintain and secure the surface facilities and mine openings.

#### Compliance

The applicant has demonstrated compliance with this section.

#### Stipulation

None.

UMC 817.132 Cessation of Operations: Permanent

Applicant's Proposal

Backfilling and regrading of disturbed lands has been committed to in order to restore all areas affected by surface operations as near as possible to the contour of the land prior to disturbance (see Section 817.101-.106). Reclamation of affected areas including revegetation is outlined in Section UMC 817.111-.117. All openings will be sealed as per the request of the MMS (acceptance of the proposed form of action was stated in a letter dated September 24, 1981, from Jackson Moffitt).

All surface equipment, as well as structures, including all concrete foundations, will be removed by the applicant after the permanent cessation of operations. At the time that the mine closure plan is submitted to the MMS, a copy will be forwarded to the Division for concurrence and approval and for addition to the mine plan on file. A copy will also be placed at the Emery County Recorder's Office.

Compliance

The applicant has achieved compliance with this section.

Stipulation

None.

UMC 817.133 Postmining Land-Use

Applicant's Proposal

Prior to 1939, the permit area was used for dispersed, nondeveloped recreation and grazing by native big game species. From 1939 until 1955, the area was mined by traditional room and pillar methods. Approximately 35,000 tons were removed from the Hiawatha Seam. Since termination of mining, the land has reverted to its original uses. Cattle are moved through the canyon to grazing areas at higher elevations. Some grazing occurs in the riparian areas at these times, but the canyon slopes are too steep to be suitable for regular grazing. The area is also unsuitable for logging.

After mining operations cease, the area will be restored to support uses it was capable of supporting prior to mining. Since the area will be returned to its approximate original contours, it will most likely be too steep for grazing by other than native game species. The access road will be left in place, pursuant to the wishes of the USFS (surface landowner).

Compliance

The applicant's proposal complies with this section.

Stipulations

None.

UMC 817.150-.176 Roads

Applicant's Proposal

The applicant is constructing an access/haul road from State Highway 31 in Huntington Canyon approximately 1 1/2 miles up Crandall Canyon to the minesite. The road is being constructed by Genwal Coal Company under the supervision of Manti-LaSal National Forest Service. A document for legal right-of-entry and construction of the access road through Forest Service lands is included as Item B of the September 1981 ACR Response. The road will be maintained by Genwal until such time that other uses for the road develop; then, the maintenance will be proportioned as determined by the Forest Service. The Forest Service will retain the road for access to future mine development and other designated uses in Crandall Canyon.

The access road becomes part of the applicant's mine permit application at Station 67+00 (see Drawing No. G01-C-007). The overall grade of the road from Station 67+00 is approximately seven percent; maximum pitch grade is 8.3 percent. Proposed embankment slopes are shown on the typical road section, Drawing No. G01-C-007, Drawing No. 016 and Drawing No. G01-C-017-Section A. The drawings show embankments of 1.5h:1v and 1.25h:1v. The applicant has submitted a slope stability study of the access/haul road in the Design Report: Crandall Canyon Mine Access and Coal Haul Road (Boyle Engineering Corporation, received September 16, 1981). A cross section at Station 73+00 was analyzed for stability (Station 73+00 has proposed embankment slopes of 1.25h:1v). A minimum factor of safety of 1.36 was obtained which exceeds the 1.25 required factor of safety. The haul road will be gravelled and the surface will be adequately sloped to drainage ditches as shown on the cross section on Drawing No. G01-C-007 and Drawing No. G01-C-016. Placement of embankment fills and compaction methods will be done as per USFS specifications outlined in the December ACR Response, pages 49-56. Traffic control signs will be installed as shown on Drawing No. G01-C-025.

In addition to the access/haul road, the applicant has proposed the construction of two Class II roads within the permit area. The roads would be to the upper and lower portals as shown on Drawing G01-C-016. Traffic on the portal access roads will be limited to underground mine equipment, man-trip and maintenance and supply vehicles necessary for operations. The grades for both access roads are less than 10 percent. Cut slopes of 1/4h:1v (competent bedrock), 1/2:1 (fractured bedrock) and 1:1 (shallow surficial deposits-less than four feet deep-overlying bedrock) are proposed for the portal access roads. A Slope Stability Investigation was submitted (by Delta Geotechnical Consultants) with the December ACR Response with a safety factor of 0.72 for the shallow surficial deposits of proposed 1:1 cut slopes. Since the safety factor does not comply with 817.162(c) requirements, cut slopes with 1:1

slopes will be rounded to 1.5:1 in the shallow surficial material. The applicant has provided drainage plans for haul and portal access roads with the road surface sloped to the drainage ditches. The portal access roads will be constructed of a gravel surface underlain by suitable base and subbase material. The portal access roads will be reclaimed in accordance with backfilling and grading plans.

Compliance

The applicant is in compliance with UMC 817.150-.176, Roads.

Stipulation

None.

UMC 817.180 Other Transportation Facilities

Applicant's Proposal

The operator has proposed two 42-inch storage conveyors with associated crushers located at the point of transfer from the direct out-of-mine belt. There will be two coal loading areas and one truck turnaround loop at the minesite. The runoff from the disturbance area created by this installation will be treated by the sedimentation pond. No other transportation facilities related to this section are proposed for the mine operation.

Compliance

The applicant's proposal complies with this section.

Stipulations

None.

UMC 817.181 Support Facilities and Utility Installations

Applicant's Proposal

Portable facilities for office space, power generation and toilets will be employed. Material storage areas will be made underground in the old workings. Pole mounted sodium vapor lamps and buried power cables will be utilized. No permanent mainline utility lines or associated electrical substations are proposed. Coal storage is proposed in two areas, each one a 100-foot diameter open stockpile. Loading from these stockpiles is proposed to be accomplished by front-end loader into haul trucks. Runoff and drainage from these areas will be directed to the sediment pond. There are no pipelines, wells, power or telephone lines, nor railways present on the mine plan area. Therefore, no impacts will result from the mining operation to any such structures.

Compliance

The operator's proposal complies with the requirements of this section.

Stipulations

None.

UMC 822.11-.14 Alluvial Valley Floor

Applicant's Proposal

The applicant has provided a letter, dated November 23, 1981, from T.B. Hutching of the SCS. In the letter, it is stated that there are no significant areas of soil characteristic of alluvial valleys for the proposed site, therefore, no significant area of AVF exists.

Mr. Hutching states that none of the soils are suited for agricultural production because of restrictive climatic limitations.

The U. S. Forest Service has performed a preliminary environmental assessment (EA) which states on page 2, that the Interdisciplinary Team (ID Team) did not identify any prime or unique range, farmlands or alluvial valley floors relative to the proposed minesite.

Compliance

The applicant has submitted and specified very little detailed site-specific information for the Division to make a determination as to the presence or absence of an AVF pursuant to UMC 785.19 and 822.11-.14. However, it is the Division's opinion, based upon several on-site assessments, that there are several conditions which could preclude this area as being designated as an AVF.

- (1) The mine area has significant topographic constraints, namely, a high elevation (above 8,000 feet), very narrow steep-sided canyon, which exhibits minimal areal extent for potential development of a significant agricultural practice. The small surface area is of such an insignificant extent, that the expense of developing the area would be cost-prohibitive versus the benefits derived as a result of any such development.
- (2) The high elevation, and short growing season characteristic of the area would also preclude the development of any significant agricultural practice.
- (3) There are no physical indications of any historical irrigation practices in the immediate or adjacent area. Also, regional practices do not indicate that areas similar to those typical of this site, have been utilized for agricultural activities.

- (4) There are no current irrigated agricultural practices on AVF's within 10 or more miles of the minesite proposal.
- (5) Although the general mine plan area does receive some limited domestic grazing utilization, this impact is minimal. This area is primarily a corridor for passage of animals to summer or winter pastures. Hence, this area does not fall under the criteria of a developed rangeland situation.

Stipulation

None.