



0012

STATE OF UTAH  
NATURAL RESOURCES  
Oil, Gas & Mining

Scott M. Matheson, Governor  
Temple A. Reynolds, Executive Director  
Dianne R. Nielson, Ph.D., Division Director

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

July 13, 1984

Mr. Allen D. Klein, Administrator  
Western Technical Center  
Office of Surface Mining  
Brooks Towers  
1020 Fifteenth Street  
Denver, Colorado 80202

Dear Mr. Klein:

RE: Final Technical Analysis and Decision Document, Beaver Creek  
Coal Company, C. V. Spur Preparation Plant, ACT/007/022, Folder  
#2, Carbon County, Utah

Enclosed for your records is a copy of the Division's Final  
Technical Analysis and Decision Document for the above referenced  
State operation.

After thorough review of the Mining and Reclamation Plan, the  
State is now preparing to issue final approval of this operation  
under the approved State program, upon acceptance of special  
stipulations by Beaver Creek Coal Company.

Should you or your staff have any questions regarding this  
document, please contact the Division accordingly.

Sincerely,

A handwritten signature in cursive script that reads "Dianne R. Nielson".

Dianne R. Nielson  
Director

DRN/mmb:btb

Enclosures

cc: Dan Guy, Beaver Creek Coal Company  
Barbara Roberts, Attorney General's Office  
R. Daniels, DOGM  
J. Smith, DOGM  
M. Boucek, DOGM  
J. Whitehead, DOGM

86910

## TECHNICAL ANALYSIS AND DECISION DOCUMENT

Beaver Creek Coal Company  
C. V. Spur Preparation Plant  
ACT/007/022, Carbon County, Utah

July 13, 1984

### Introduction

The Castle Valley Spur (C. V. Spur) Coal Processing and Loadout Facility is owned and operated by Beaver Creek Coal Company, a wholly owned subsidiary of Atlantic Richfield Company of Los Angeles, California. The facility is located approximately four (4) miles south-southeast of Price, Utah, Township 15 South, Range 10 East.

The C. V. Spur site was used as a coal loadout prior to 1977 and then a preparation plant and loadout following 1977. The Atlantic Richfield Company acquired the C. V. Spur property on December 31, 1979.

On August 19, 1980, Beaver Creek Coal Company submitted a Mining and Reclamation Plan (MRP) to fulfill the requirements of Public Law 95-87 and Utah Code Annotated 40-10-1 et seq. The Division reviewed the plan to determine it complete four times with deficiency letters dated April 3, 1981, May 6, 1983, August 3, 1983 and November 11, 1983. On December 5, 1983, the plan was determined complete and legal advertisement published for four consecutive weeks beginning December 14, 1983 in the Sun Advocate of Price, Utah.

A total of 117 acres will be disturbed during the life of the facility. Approximately 77.2 acres of this was disturbed prior to the enactment of the Surface Mining Control and Reclamation Act of 1977.

The surface area is 100 percent fee.

### Existing Environment

The C. V. Spur facility is located in Castle Valley, a broad, relatively flat, featureless plain lying between the Wasatch Plateau on the west and the San Rafael Swell on the east. At an elevation of 5,500 feet with an annual rainfall of 9.25 inches, the area is characteristically dry, supporting a saltbush vegetative community.

The surface waters in and around the site are ephemeral at best with the nearest perennial creeks residing nearly a mile from the permit area. Ground water resources in the area are quite limited which is expected given the Mancos shale geology in the area.

There are no known threatened or endangered plant or animal species on or adjacent to the permit area.

UMC 817.11 Signs and Markers

Existing Environment and Applicant's Proposal

The applicant's proposal for signs and markers is contained on pages 3-39 through 3-43 of the MRP. Representations of the entrance signs, perimeter boundary markers, soil stockpile signs, vegetation reference area signs and MSHA refuse disposal area signs are contained in the MRP. There are no permanent or intermittent streams within the permit area which would require stream buffer zone markers.

Compliance

The applicant's proposal complies with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

There are no oil or gas wells within the mine plan permit area. There are nine observation (monitoring) wells at various places on the C. V. Spur site. These wells are cased and will be sealed with cement during the final reclamation phase of the project. This is outlined in Section 3.5.3 of the MRP, page 3-54.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.21-.25 Topsoil

Existing Environment and Applicant's Proposal

The applicant presents the Soil Resources section of the MRP in Chapter 8, Volume 2.

C. V. Spur is located approximately one mile from the Price River flood plain and four miles southeast of Price in Carbon County.

Rainfall ranges from 6 to 11 inches/year, mean annual soil temperatures range from 47° to 57° F and the number of frost free days range from 110 to 160. Native vegetation consists mainly of saltbush and grasses. The area has been used as rangeland and wildlife habitat.

Soil in the area formed in alluvium from marine shale and sandstone. They are generally shallow and may have salt and sodium problems.

Five soil series were found to exist within the permit area: Billings; Chipeta; Killpack; Killpack High Water Variant--all torrifuvents; and saltair, a salorthid. The saltair series are generally highly saline and may form salt crust on the surface.

"A" horizons range from as shallow as three inches in portions of the Chipeta to as thick as 10 inches in the Killpack. Soil textures include silt loam, silty clay loam and silty clay. Infiltration is generally slow and water erosion potential moderately high.

The C. V. Spur Preparation Plant is a combination of pre-Law (prior to the 1977 enactment of Public Law 95-87, the Surface Mining Reclamation and Control Act) and post-Law disturbance. Approximately 77 acres of land had been disturbed before enactment of Public Law 95-87 and the remainder has been or will be disturbed post-Law (MRP, page 8-36). On the 77 acre pre-Law disturbance, no topsoil was stockpiled for reclamation. On post-Law disturbance that has already occurred (35.4 acres), approximately 13,700 yd<sup>3</sup> of soil have been removed and stockpiled (MRP, page 8-36a). An additional disturbance of 11 acres is proposed with topsoil removal depth of six inches on the Chipeta and six inches on the Killpack, generating approximately 10,500 yd<sup>3</sup> of topsoil (MRP, Table 8-6, page 8-33). The topsoil will be stripped, stockpiled in the designated areas (Plate 3-2) and seeded in accordance with the interim revegetation plan.

A variance for nonremoval of topsoil from the saltair series has been requested and granted, the justification being the high salt content of this particular soil series.

At the time of final reclamation, the regraded areas of post-Law disturbance will be covered with six inches of the stockpiled topsoil and seeded in accordance with the final revegetation plan (MRP, Section 3.5.4.3).

Areas that were disturbed pre-Law, except on the refuse disposal site, will not have topsoil replaced. These areas will utilize the soils that are in place at the time of reclamation. Chemical and physical analysis of the pre-Law disturbances have been conducted. The results (Table 8-5, page 8-29 of the MRP) indicate that the in situ soil is of equal quality to that of the stockpiled topsoil. These pre-Law areas will be disced, cloddy surfaces will be pulverized and the area seeded in accordance with the final revegetation plan (see UMC 817.111-.117 of this document).

The pre-Law refuse disposal area will be covered with six inches of the stockpiled topsoil and seeded in accordance with the final revegetation plan (MRP, page 8-36a). The shallow depth of cover material should be adequate because: (1) the refuse material is nontoxic in nature; (2) the native soil is shallow and of poor quality; and (3) analyses of the refuse material indicate that, other than texture, it is rated fair as a plant growth medium.

#### Compliance

The applicant complies with this section.

#### Stipulations

None.

#### UMC 817.41 Hydrologic Balance: General Requirements

##### Existing Environment and Applicant's Proposal

The applicant presents the hydrology aspects of the C. V. Spur operation in Chapter 7 of the MRP.

The C. V. Spur Preparation Plant is located in Castle Valley, a broad featureless plain lying between the Wasatch Plateau on the west and the San Rafael Swell to the east. The permit area lies on top of the Bluegate Shale member of the Mancos Formation. The Ferron Sandstone lies roughly 500 feet below and is the only regional aquifer in the area.

The Bluegate Shale is a blue-gray marine mudstone acting as an aquitard. The upper 10 to 20 feet of the Bluegate contains weathered clays with some lenses of gravel and residual clay loam soils typical of weathered Mancos Shale.

Well log data from oil and gas drilling in the area indicate that water in the Ferron Sandstone, at least in this vicinity, is brackish or salty in nature. Ground water quality in general in the Mancos Shale area is characterized by high levels of Total Dissolved Solids (TDS).

Surface water in and around the C. V. Spur site is ephemeral at best with annual precipitation averaging 9.25 inches. The permit area lies over one mile from the nearest perennial or intermittent stream (the Price River).

The applicant's proposal (Section 7.1.4 and 7.1.5 of the MRP) to minimize impacts to the ground water system includes a french drain along the western and northern boundaries of the permit area to intercept and route shallow ground water around the site. Additionally, the applicant has installed a system of ground water monitoring wells on and adjacent to the permit area to detect any impacts to the ground water system.

The applicant's proposal (Section 7.2.5 of the MRP) to minimize impacts to the surface water system includes routing disturbed area runoff to sedimentation ponds via a series of structures which include ditches and culverts. The applicant's plant water system cleans and recirculates plant water overflow with no discharge of plant water occurring. Undisturbed drainage is routed around the disturbed area via diversion ditches.

#### Compliance

Given the applicant's proposal and background data on the ground water system at the C. V. Spur site, no impact is anticipated to the ground water system. This is also supported by the fact that there are no underground operations at the C. V. Spur site. The applicant complies with this section in regards to ground water.

The applicant's surface water proposal meets the general requirements of this section. Specific deficiencies are addressed in the compliance sections for regulations UMC 817.42-.57.

#### Stipulations

None.

#### UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations

#### Existing Environment and Applicant's Proposal

The applicant proposes to meet water quality effluent standards by routing surface drainage from the disturbed area into sedimentation ponds. On pages 7-78 and 7-80 of the MRP, the applicant notes that the water from these sedimentation pond systems is normally not discharged, but fed back into the plant water intake system.

The applicant has obtained National Pollutant Discharge Elimination Permit #UT-00239490 with the approved outfall from pond #6.

On page 3-54 of the MRP, the applicant notes that all sedimentation ponds and diversion ditches will remain in place until an effective vegetation cover is established during final reclamation.

### Compliance

With the exception of pond #6 where some sizing questions remain, the applicant's sedimentation pond system will contain the 10-year, 24-hour storm event assuming the pond system is empty from previous runoff or plant water. The information in the MRP does not definitively demonstrate that effluent limits will be met; however, the applicant's surface water monitoring plan should detect when and if effluent limitations are exceeded. Further, the fact that runoff water is cycled into the plant reduces greatly any chance of discharge. The applicant is in compliance with this section when the conditions of stipulations in UMC 817.46 are met.

### Stipulations

See Stipulations under UMC 817.46.

### UMC 817.43 Hydrologic Balance: Diversions and Conveyance of Overland Flow, Shallow Ground Water Flow and Ephemeral Streams

#### Existing Environment and Applicant's Proposal

The TR-20 storm hydrology analysis performed to assess sediment pond outlet adequacies was also structured to permit assessment of collection ditches and culvert capacities. Storm hydrographs from each sub-drainage are routed through the culverts and ditches shown on Plate 3-2, Volume 1, MRP. Design dimensions and design discharges and velocities for the collection ditches are provided on Plate 7-5, Volume 2, MRP. Design dimensions for the culverts designated on Plate 3-2 are provided in Table 7-25 on page 7-88a of the MRP. All design analyses were performed for a 25-year, 24-hour rainfall event using the Farmer-Fletcher rainfall distribution.

### Compliance

The applicant has adequately designed all ditches and culverts within the C. V. Spur permit area to handle either the 10-year, 24-hour storm event or the 25-year, 24-hour storm event, where applicable. The applicant is in compliance with Sections (a)-(c), (e) and (f) of this regulation. Sections (d) and (g) do not apply to the permit area.

Stipulations

None.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions

Existing Environment and Applicant's Proposal

The applicant has not diverted flow from perennial and intermittent streams, and ephemeral streams with drainage areas greater than one square mile, within the permit area.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.45 Sediment Control Measures

Existing Environment and Applicant's Proposal

The applicant's proposal for sediment control (Section 7.2.3.3 of the MRP) incorporates routing all disturbed area drainage via ditches and culverts to a system of sedimentation ponds. Runoff from the sedimentation pond system is used for plant water make-up rather than discharging effluent off-site.

Compliance

Based on the nearly flat topography and very mild slopes at the C. V. Spur site, as well as the nonerosive velocities in disturbed and undisturbed diversion ditches, the applicant complies with this section.

Stipulations

None.

UMC 817.46 Sedimentation Ponds

Existing Environment and Applicant's Proposal

The applicant has five sedimentation ponds at the C. V. Spur site for control of disturbed area drainage. Ponds 1, 2 and 3 are in a series, and for purposes of discussion, are referred to hereafter as pond #1. Ponds #1 and #5 route discharges to pond #6 which is the lowermost sediment control structure on-site (see Plate 3-2 in the MRP for layout of the ponds).

Pond #6 is used as a sedimentation pond as well as being a part of the plant water make-up system. Two gravel dikes in pond #6 provide filtration and cleaning for water passing through pond #6. Storm water retained in pond #6 is drawn off into the coal cleaning plant, minimizing the need for off-site discharge from pond #6.

All ponds at the C. V. Spur site are incised with a compacted berm approximately three feet high around the pond. The berm is added only for overflow protection and is not considered in sizing calculations.

Page 3-54 of the MRP notes that the sedimentation ponds will remain in place until an effective vegetative cover has been reestablished during reclamation.

Plate 7-4a of the MRP denotes the sediment cleanout levels with the markers to be used for all the ponds.

On page 3-32 of the MRP, the applicant commits to an inspection program for all ponds as per the requirements of UMC 817.46(t).

For the design specifications and details on the sedimentation ponds, refer to pages 3-31, 3-32, 7-80 and Plates 7-4 and 7-4b of the MRP.

### Compliance

Runoff volumes were verified using the Soil Conservation Service (SCS) curve number equation employing acreages calculated by the regulatory authority. The volumes calculated by the regulatory authority were 8-15 percent higher than those calculated by Beaver Creek Coal Company (BCCC).

Sediment volumes calculated by the applicant in the Universal Soil Loss Equation (USLE) were verified by the regulatory authority.

Total pond volume requirements incorporating sediment volume and runoff volume from the 10-year, 24-hour event indicate that ponds #1 and #5 are adequately sized.

Pond #6 appears to be undersized based on the calculated one year sediment volume and the 10-year, 24-hour runoff volume. Utilizing Plates 7-4 and 7-4b in the MRP, the volume of pond #6 as calculated by the regulatory authority is 1.4 acre feet. This volume is excluding the volume of the gravel dikes (the same methodology used by the applicant, page 7-81 MRP). The required volume necessary for pond #6 to contain the 10-year, 24-hour storm runoff and one year sediment storage volume as calculated by the

regulatory authority is 1.9 acre feet. The applicant will need to submit either revised drawings and calculations to demonstrate that the existing configuration of pond #6 has adequate storage volume or submit plans to increase the size of pond #6 to achieve the proper storage volume.

The applicant's peak flows for the 25-year, 24-hour storm were verified using the University of Kentucky "Sedimot II" computer model and the Farmer-Fletcher rainfall distribution. This information was utilized to verify the adequacy of spillways. Based on the peak flows generated by the regulatory authority, it appears that the spillway configurations for all the sediment ponds are adequate to pass the 25-year, 24-hour rainfall event.

UMC 817.46(g) requires that there be no outflow through the emergency spillway during a 10-year, 24-hour precipitation event regardless of the volume of sediment and water present in the pond. Based on site inspections by the regulatory authority (the most recent being February 15, 1984), the sediment pond system at C. V. Spur has remained full or nearly full for a period of a year or more. Some of this situation is attributable to the plant water problem which existed and was to have been addressed by the installation of the plant water overflow pond. The plant overflow pond has been in place for 10 to 11 months as of the date of this writing, but the pond system during a large portion of that time was full. It appears that the applicant's proposal (page 3-32 of the MRP) to pump down water levels of ponds cannot meet the requirements of this section. The applicant maintains on page 3-32 of the MRP that delayed re-establishment of needed storm runoff detention volumes is desirable in that water retained in the sediment pond system is recycled into the plant. The regulatory authority agrees with this reasoning as long as needed storm runoff detention volumes are re-established after a storm event within 30 days. The applicant needs to commit to this in writing.

Stipulations 817.46-(1-2)-JW

1. The applicant must commit in writing, within 30 days of permit approval, to re-establishing the 10-year, 24-hour storm runoff detention volumes in all sediment ponds within 30 days after a storm event or when plant water overflows occupy any of the volume needed to contain the 10-year, 24-hour storm event.
2. The applicant must submit, within 30 days of permit approval, either: (1) revised drawings and calculations demonstrating that pond #6 can contain the 10-year, 24-hour storm runoff volume and one year of sediment volume; or (2) complete plans including cross-sections and supporting calculations to increase the size of pond #6 to contain the 10-year, 24-hour storm runoff volume and one year of sediment volume.

UMC 817.47 Hydrologic Balance: Discharge Structures

Existing Environment and Applicant's Proposal

The applicant has used the TR-20 computer model, standard engineering practice, to analyze the effectiveness of sediment pond outlet structures.

Compliance

The applicant has provided the necessary information on what measures have been taken to reduce erosion from exit velocities associated with discharge structures. The protection measures proposed indicate the applicant is in compliance with this section.

In the rare event that a discharge overtops a structure, little damage or erosion should occur because the ponds are incised.

Stipulations

None.

UMC 817.48 Hydrologic Balance: Acid-forming and Toxic-forming  
Materials

Existing Environment and Applicant's Proposal

Coal and preparation plant reject material have been sampled and analyzed for toxic- and/or acid-forming potential. Results of the laboratory analyses are presented on pages 3-4 to 3-15 of the MRP. To further insure that toxic- and/or acid-forming material be prevented from entering surface or ground water, the applicant has proposed, on a quarterly basis, to inspect the waste banks and monitor water. If these inspections disclose a potential hazard, the regulatory authority will be notified immediately.

Compliance

The coal and preparation plant refuse, based on the laboratory results, pages 3-4 to 3-15 of the MRP, do not indicate a potential hazard of forming toxic or acid substances. The applicant has further committed to a quarterly monitoring of the waste disposal site for stability and safety hazards.

The laboratory results in the MRP (pages 3-4 to 3-13) are for sampling which occurred in either December of 1979 or February of 1980. The quality of the coal being processed may change over time and vary from coal seam to coal seam. It is, therefore, necessary

for the applicant to sample each individual coal seam being processed (cleaned) at the plant as well as the refuse material itself on an annual basis to assure that toxicity levels have not changed significantly.

The applicant will be in compliance when the following stipulations are agreed to.

Stipulations 817.48-(1)-JW

1. The applicant shall submit once each year, by January 1, to the regulatory authority a chemical analysis of each individual coal seam that will be or is being processed in the cleaning plant. The analysis shall depict pH, percent sulphur, and neutralization potential as tons of Ca, Co, equivalent per 1,000 tons of material.

In addition, on an annual basis, by January 1, the applicant will submit analysis of refuse material from a representative sampling of the refuse disposal area depicting the previously mentioned constituents.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments

Existing Environment and Applicant's Proposal

The applicant does not propose any permanent impoundments on the permit area (Section 3.5.3 of the MRP). Temporary impoundments which are not part of the sedimentation pond system include the thickener pond, thickener overflow pond and the plant overflow pond (the applicant's proposal for the sediment ponds is covered in UMC 817.46).

Both the thickener overflow and plant overflow ponds are incised impoundments and do not have embankments associated with them. The thickener pond is constructed with concrete sides and bottom.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharges

Existing Environment and Applicant's Proposal

The C. V. Spur operation is a coal processing and loadout facility. Coal is transported to the site via double trailer highway trucks. No mining of coal or underground entries exist at the C. V. Spur operation (MRP, page 1-1).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.52 Hydrologic Balance: Surface and Ground Water Monitoring

Existing Environment and Applicant's Proposal

The applicant's surface water and ground water monitoring proposals are in Sections 7.2.6 and 7.1.6 of the MRP.

The applicant has installed a network of ground water observation wells on and adjacent to the C. V. Spur facility. Monthly water levels and quarterly water quality sampling has been undertaken to establish baseline data. The plan proposes to monitor the ground water sampling points biannually in the spring and fall, obtaining water levels and chemical analysis (parameters listed in Plate 7-15 of the MRP) for each monitoring point. Field measurements of pH, conductivity and temperature will be taken during sampling.

Surface water monitoring proposed includes monthly monitoring of discharge points from pond #6 according to the NPDES discharge permit and quarterly monitoring of the north drainage ditch northeast of the permit area. The parameters to be sampled for are listed in Table 7-15 of the MRP.

Compliance

Based on the applicant's ground water well monitoring program, the ground water monitoring proposal is in compliance with this Section. The applicant's surface water monitoring proposal with two monitoring points is in compliance in light of the fact that there is very limited surface water on or adjacent to the C. V. Spur site.

Stipulations

None.

UMC 817.53 Hydrologic Balance: Transfer of Wells

Existing Environment and Applicant's Proposal

The applicant indicates on page 3-54 of the MRP that there are no plans to transfer any wells to other parties.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.54 Hydrologic Balance: Water Rights Replacement  
(40-10-29[2], Utah Code Annotated)

Existing Environment and Applicant's Proposal

The applicant has committed to replacing any existing water right which is diminished as a result of the C. V. Spur operations with water from 357 shares of reservoir water (page 7-89a, MRP).

Compliance

It appears unlikely that the operations at this facility will have an adverse effect on water rights in the area. The applicant complies with this section.

Stipulations

None.

UMC 817.55 Hydrologic Balance: Discharge of Water into an  
Underground Mine

Existing Environment and Applicant's Proposal

The C. V. Spur operation is strictly a coal processing and loadout facility with no underground entries (see discussion under UMC 817.50).

Compliance

The applicant complies with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

The applicant does not propose any permanent structures for the C. V. Spur operation (MRP, page 3-54, 54a).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.57 Hydrologic Balance: Stream Buffer Zones

Existing Environment and Applicant's Proposal

No perennial or intermittent stream crosses or comes within approximately one mile of the permit area (Plate 1-1, MRP).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.61-.68 Use of Explosives: General Requirements

This is a preparation and loadout facility, therefore, this section is not applicable.

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

This section is not applicable.

UMC 817.81-.85 Coal Processing Waste Banks

Existing Environment and Applicant's Proposal

The coal processing waste banks are outlined in Section 3.2.3.3 of the MRP, pages 3-3 to 3-15 and shown on Plate 3-2.

Coal processing waste at C. V. Spur is truck hauled from the preparation plant to the designated disposal site within the permit area. The design, construction and maintenance of the waste bank is under the supervision of a registered professional engineer.

The coal processing waste is the reject from the washing cycle used to clean and upgrade the coal from BCCC mines in the Carbon-Emery county area. All of the seams producing coal for this plant are low sulphur (0.5 percent to 0.8 percent). The reject is also low sulphur, nonacid and nontoxic. The texture of the refuse material is coarse.

The refuse banks will be inspected under the supervision of a qualified registered engineer at least quarterly until the bank has been graded, covered and reseeded. Inspections will include observations of any potential safety hazards to assure that organic material and topsoil is removed before deposition and that construction and maintenance are being performed in accordance with the design plan.

If such inspection discloses a potential hazard, the inspector will immediately notify the regulatory authority of the hazard and emergency procedures will be implemented. Copies of the inspection findings will be maintained for review at the site.

Protection of water resources is accomplished through the use of sedimentation and filtering ponds and a system designed for no discharge from the permit area within a 10-year, 24-hour precipitation event. A subdrainage system is employed upslope from the refuse disposal area. The surface drainage from the refuse pile is collected into a collection pond downslope. The overflow from this pond is conveyed through an additional collection ditch to a final filtering pond and discharged into the same underground sump to be recirculated through the plant as wash water. Slope protection is provided at the face of the refuse bank through the use of terracing. Upon completion, the bank will be graded, covered with suitable plant growth material and revegetated.

The refuse piles are knocked down and spread at least every other day. Compaction should take place during spreading. The refuse is compacted in layers not to exceed 24-inches, starting at the perimeter and working out. Compaction will be to 90 percent of maximum dry density. The pile will be graded and maintained to allow drainage and prevent water impoundment. No burned coal waste, other minerals, or refuse is to be removed from the disposal area.

A static safety factor of 1.98 was derived using worse case conditions.

Following grading of the coal processing waste bank, the site shall be reclaimed as outlined in UMC 817.21-.25 and 817.111-.117 of this TA.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.86-.87 Coal Processing Waste: Burning and Burned Waste Utilization

Existing Environment and Applicant's Proposal

The coal processing waste is the reject from the washing cycle used to clean and upgrade the coal from the BCCC mines in the area. This is outlined in Section 3.2.3.3, pages 3-16 to 3-18 of the MRP. The coal processing waste is inspected at least quarterly for any potential hazards. In the event a coal processing waste fire did start, a contingency plan is outlined on page 3-17 of the MRP.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.89 Disposal of Noncoal Wastes

Existing Environment and Applicant's Proposal

Temporary storage of noncoal waste is in a metal trash receptacle in a designated portion of the permit area. Garbage is loaded into a truck and disposed of at an approved sanitary landfill as outlined in Section 3.2.3, MRP, page 3-2, and shown on Plate 3-2.

Oil and grease waste are collected within a buried tank located south of the plant. As needed, the tank will be pumped into a commercial disposal truck and disposed off-site (page 3-2 of the MRP).

Compliance

The buried tank that collects oil and grease waste ensures that leachate and surface runoff do not degrade surface and ground water and that the area remains stable and suitable for reclamation.

The applicant complies with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

There are no dams or embankments constructed of coal processing waste at the C. V. Spur site.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.95 Air Resources Protection

Existing Environment and Applicant's Proposal

The applicant's proposal for air resource protection is contained on pages 11-4 and 11-11 through 11-17 of the MRP. Tables 11-6 and 11-7 detail the specific air pollution control measures, including enclosed hoppers, crushers, covered conveyors and storage, concrete stacking tubes, silos and water sprays.

Compliance

Based on conversations with the Air Quality section of the Utah Department of Health (DOH) and an approval letter dated August 21, 1980 from the DOH, the applicant is in compliance with the air quality provisions of the regulations.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values

Existing Environment and Applicant's Proposal

The C. V. Spur project area is classified as a saltbush vegetation community and is dominated by low growing shrubs and a large amount of bare ground (Chapter 9). This community provides cover and food for relatively few wildlife species when compared to more diverse vegetation types found in Utah.

Economically important and high interest species which utilize habitats within and adjacent to the permit area include the ring-necked pheasant, mourning dove, desert cottontail, badger, coyote and white-tailed prairie dog (Section 10.3.2). Observations by company environmental personnel have not indicated occurrences of raptors or migratory birds of high federal interest on the site. However, due to the proximity of the project site to surrounding cropland and the Price River (approximately one mile from the floodplain), the area could provide minimal food and cover for these species (Sections 10.3.1 and 10.3.3 of the MRP).

Three federally listed threatened or endangered species of wildlife, bald eagle, peregrine falcon and black-footed ferret, may inhabit areas around C. V. Spur. Habitat surrounding the permit area is ranked as of substantial value to the bald eagle and peregrine falcon (Section 10.3.3 of the MRP). The area is also classified as historic range for the black-footed ferret. However, field studies conducted by the operator in the white-tailed prairie dog community showed no evidence of use by ferrets (Section 10.3.3.1 of the MRP).

Mitigation and management plans for terrestrial species focus on minimizing impacts related to continued mining-related activity and facilitating rapid return of the site to suitable habitat following mining (Section 10.5 of the MRP).

Other mitigation measures include conducting "employee awareness" programs to inform company personnel of sensitive periods for wildlife, contemporaneous reclamation of disturbed areas to wildlife habitat, and prevention of hunting and harassment of wildlife in the permit area (Section 10.5 of the MRP). A commitment has also been made to not use persistent pesticides on the area without regulatory approval (Section 3.5.5.4 of the MRP).

Following mining, the applicant will implement revegetation methods designed to restore and enhance wildlife habitat on disturbed areas. The revegetation plant mix includes herbaceous and

woody species that are adapted to on-site conditions and are of known value to wildlife for cover, forage or both. A complete revegetation plan including species lists and site specific revegetation procedures is given in Section 3.5.5 of the MRP.

### Compliance

The C. V. Spur project area has been used for coal loading since 1975. Beaver Creek Coal Company acquired the facility in 1977. Of the 117 acres planned for disturbance, 112.6 have already been disturbed (Section 9.5 of the MRP). Therefore, the applicant has designed mitigation and management plans to minimize impacts related to continued operation and to return the site to suitable wildlife habitat following mining (Section 10.5 of the MRP).

Field surveys and literature searches to determine the presence of threatened and endangered plant species (Section 9.4 of the MRP) and animal species and bald or golden eagles or critical habitat (Section 10.2 of the MRP) have been conducted by the applicant. Habitat around the permit area is ranked a substantial value to the bald eagle and peregrine falcon (Section 10.3.3 of the MRP). However, it is unlikely that these raptors utilize the site due to continuous operations of the Spur. This is supported by the fact that routine observations by company environmental personnel have not indicated occurrences of raptors on the site (Section 10.3.3.2 of the MRP).

Although the project area is classified by the Utah Division of Wildlife Resources (UDWR) as historic range for black-footed ferrets (Section 10.3.3 of the MRP), no confirmed sightings have been made on or near C. V. Spur and an intensive field survey found no evidence of them (Section 10.3.3.1 of the MRP). Therefore, no effects on this species are expected.

The applicant has made a commitment to promptly report the discovery of the presence of any threatened or endangered species or any bald or golden eagle that has not been previously reported to the regulatory authority (Section 3.4.5.3 of the MRP).

The U. S. Fish & Wildlife Service (USFWS) has determined that the armless configuration and close proximity of the powerline to the C. V. Spur accounts for limited use by raptors. No modifications are required at this time (letter dated November 10, 1982 from USFWS to DOGM).

Plant species to be used for permanent revegetation are shown in Tables 3-2 and 3-3. Species have been selected which provide nutrition and cover to wildlife and will enhance wildlife habitat after release of bonds.

Stipulations

None.

UMC 817.99 Slides and Other Damage

Existing Environment and Applicant's Proposal

Refuse piles are inspected regularly under MSHA requirements and construction procedures assure the long-term stability of the piles. No adverse impacts to human safety or environmental quality are foreseen. If a slide should occur which may have a potential adverse effect on public, property, health, safety or the environment, the applicant will notify the regulatory authority immediately and comply with remedial measures required by the regulatory authority as outlined in Section 3.4.7 of the MRP.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation

Existing Environment and Applicant's Proposal

The applicant has committed to contemporaneous reclamation of refuse disposal areas as the piles become completed. The areas will be covered with an appropriate amount of plant growth material, seeded, fertilized, mulched and revegetated to acceptable reclamation standards (Section 3.5.1 of the MRP).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading

Existing Environment and Applicant's Proposal

At the termination of operations, the surface area, except the refuse pile, will be graded to a final land form as indicated on Plate 3-7 of the MRP. The backfilling and grading effort will be

minimal due to the fact that the area is relatively level, requiring very little overburden removal. Only the areas excavated in construction of the sedimentation ponds will require any backfilling. Material necessary for the backfilling of the sedimentation ponds is presently being used for berms and dams. The backfilling and grading plan is in Section 3.5.4, MRP, page 3-55. The reclamation time schedule for the C. V. Spur can be found on page 3-63, Sections 3.5.6 and 3.5.6.1.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.103 Covering of Coal and Acid- and Toxic-forming Material

Existing Environment and Applicant's Proposal

The C. V. Spur facility is used for the washing of coal from the Huntington #4 and Gordon Creek mines. The coal from the BCCC operation is low sulphur (0.5 percent to 0.8 percent) and the analysis of the reject material also indicates a low sulphur content. Analysis of the coal and reject material have been presented on pages 3-4 to 3-13 of the MRP. Based on these analytical results, the applicant has proposed to cover the disposal site with a minimum of six inches of soil material as per the soil redistribution plan (see UMC 817.21-.25 of this document). The 44 acres of refuse will require approximately 35,500 yd<sup>3</sup> of soil material which is presently available on-site.

Compliance

The results of the analyses conducted on the refuse material indicate that the suitability as a plant growth medium is fair. This fact, along with the shallow native soils, will allow the applicant to be in compliance with a six inch cover over the refuse material.

Stipulations

None.

UMC 817.106 Regrading or Stabilizing of Rills and Gullies

Existing Environment and Applicant's Proposal

Any areas that develop rills and/or gullies deeper than nine inches after final grading and seeding will be regraded or otherwise stabilized and reseeded as stated in Section 3.5.4.1, MRP, page 3-55.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.111-.117 Revegetation

Existing Environment and Applicant's Proposal

The C. V. Spur permit area contains two major plant communities. The Abandoned Agricultural and Grazing Land Community which comprises 12.9 percent (19.8 acres) and the Salt Desert Shrub Community comprising 14 percent (21.6 acres) of the permit area (MRP, Table 9-1, page 9-6).

A total of 112.6 acres (73.1 percent of the permit area) has been disturbed for use as industrial, refuse and processing areas. Another 4.45 acres for an Emergency Coal Stockpile Modification may also be disturbed. It is assumed that all disturbed area is former Salt Desert Shrub type and will be reclaimed to that community type (Table 9-1 and Section 9.5 of the MRP).

One reference area, representative of the salt desert shrub type, has been selected. It is located within the permit area in an undisturbed area. The reference area is fenced and will not be disturbed throughout the life of the mine. The reference area was sampled for total vegetative cover, cover by species, productivity by life form and by species and shrub density and height. Sample adequacy was achieved for all parameters with the exception of cover data (MRP, Section 9.3.2.5, Table 9-4 and Table 9-9). The reference area has been determined to be in good range condition by the SCS (letter from SCS to BCCC dated September 29, 1983).

No plants cited by the USFWS as threatened or endangered were found at C. V. Spur during surveys, nor have any been identified as being present in the general area (letter from USFWS to OSM dated October 21, 1983).

The applicant has presented a revegetation plan (MRP, Section 3.5.5) which describes procedures and planting mixtures for reclamation of temporarily disturbed areas as well as final reclamation. Seeding of grasses and forbs as well as planting of shrub seedlings will occur during the first desirable planting season after final grading, either during the spring (March 15-May 1) or fall (October 15-first snowfall) (Section 3.5.5.2 of the MRP).

The planting mixtures for final revegetation consists primarily of native grasses, forbs and shrubs. Yellow sweetclover (Melilotus officinalis) is the only introduced species included. The seed mixtures will be spread either by drilling or hydroseeding depending on topography. Areas to be hydroseeded are shown on Plate 3-7 of the MRP. All other areas are to be drill seeded. Two species, rubber rabbitbrush and sandbar willow, will be planted as containerized or bare root seedlings along the Price River pipeline system (Table 3-3 of the MRP).

The type of mulch to be applied will be dependent on final site conditions. Native hay mulch will be applied at a rate of 4,000 lbs/ac on 3:1 slopes or less. The mulch will be crimped in to prevent loss of mulch and to promote entrapment of moisture. On slopes between 2:1 and 3:1, wood fiber mulch or other commercial mulches will be applied at a rate of 2,000 lbs/ac and at a rate of 2,500 lbs/ac for slopes steeper than 2:1. Tackifiers will be used at a rate of 120-160 lbs/ac on slopes to keep mulch in place (MRP, Section 3.5.5.3).

Final reclaimed areas will be monitored at least every three years following plant establishment until bond release. Both the final reclaimed area and reference area will be sampled for cover and woody plant density during each monitoring period (Section 3.5.5, page 3-58 and page 3-63 of the MRP).

Grazing of revegetated areas by domestic livestock and wildlife will be restricted by fencing until vegetation is mature enough to maintain regrowth and control erosion (MRP, Section 3.5.5.4).

### Compliance

The C. V. Spur permit area receives approximately 6 to 11 inches of precipitation annually (MRP, Section 11.1.2 and Section 8.3.2). This amount is sufficient for the establishment of many of the species native to the area. The applicant has committed to using areas temporarily planted with native and introduced species to evaluate the suitability of species for reclamation.

The final revegetation seed mixture for the coal loadout and processing facilities (MRP, Table 3-2) contains one introduced species, yellow sweetclover (Melilotus officinalis). This species in the rate to be applied is valuable to control erosion and as wildlife forage. The suitability of this species to this site will be assessed as part of the temporary reclamation on the permit area (MRP, Section 3.5.5.2).

The feasibility of establishing a majority of the shrub cover and density through seeding is questionable due to the harshness of the site. Seeding of shrubs is deemed acceptable, though the applicant is responsible for meeting postmining cover, density and diversity requirements. If revegetation efforts fail, Beaver Creek Coal Company will be required to establish shrubs by planting which will probably extend the bond period responsibility.

The reference area method will be used to measure revegetation success. A suitable reference area has been selected, quantitatively sampled, described and fenced for protection. Sample adequacy was achieved for all parameters with the exception of cover. However, the cover data presented adequately depicts the salt desert shrub community which has been disturbed. In addition, the applicant will resample this area as part of the revegetation success monitoring program (MRP, Section 3.5.5.4). At that time, sample adequacy requirements will be met.

The applicant complies with this section.

Stipulations

None.

UMC 817.131 Cessation of Operations: Temporary

Existing Environment and Applicant's Proposal

The applicant has committed to notifying the regulatory authority when operations have temporarily ceased for more than 30 days. The notice will contain information required under Section UMC 817.131 (MRP, page 3-44).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.132 Cessation of Operations: Permanent

Existing Environment and Applicant's Proposal

The applicant presents final abandonment and reclamation plans in Section 3.5, pages 3-52 through 3-69 of the MRP.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.133 Postmining Land-Use

Existing Environment and Applicant's Proposal

Prior to the existing land-use as a coal preparation and loadout facility, the land was capable of providing limited wildlife habitat and supporting very limited grazing (MRP, Section 4.4.1) and was zoned for agricultural use. Following the cessation of the current operation, the applicant will reclaim the area employing seed mixtures which contain species that are adapted to on-site conditions and are of known value to wildlife which would be expected to inhabit the area (MRP, Section 3.4.5). In Section 3.4.1 of the MRP (page 3-44), the applicant states that reclamation efforts will be directed to recreating the pre-disturbance land-use.

Compliance

BCCC is the surface owner of this area and the regulatory authority has determined that the proposal to return the land to wildlife habitat and limited grazing land is feasible as discussed under UMC 817.111-.117 of this document and will be compatible with adjacent land-use as well as premining land-use. Therefore, the applicant is in compliance with this section.

Stipulations

None.

UMC 817.150-.156 Roads: Class I: General

Existing Environment and Applicant's Proposal

The roads are outlined in Section 3.2.5.1, MRP, pages 3-24 and 3-54a (Section 3.5.3.2) (Figures 3-5 and 3-6 detail the roads).

The main access road serves as the coal haulage road. The road is approximately 2,600 feet long from the intersection with the County Road to the plant parking lot. The road is maintained at a width of 24 feet and is gravel-surfaced. This road will be used and maintained throughout the life of the operation.

The refuse disposal road is approximately 1,584 feet long. The road is gravel-surfaced and maintained at approximately a 20 foot width. The road runs from the preparation plant to the refuse disposal area and will be maintained throughout the active phase of refuse disposal.

The roads required for access to the sedimentation ponds and diversions will be left in place until pond and diversion reclamation is underway. The roads will then be removed and reclaimed in accordance with the Backfilling and Grading Plan. There are no plans to leave any roads at this property.

#### Compliance

The applicant complies with this section.

#### Stipulations

None.

#### UMC 817.180 Other Transportation Facilities

#### Existing Environment and Applicant's Proposal

The major railroad grade embankment is located on the eastern edge of the site, immediately outside the permit area. This grade supports the main rail lines and is owned by the Denver and Rio Grande Western Railroad. This line will remain in service after the closure of the C. V. Spur.

The railroad loop within the C. V. Spur is owned by BCCC. It consists of a single set of tracks, slightly elevated (three feet) above natural ground. This rail serves as a loop for the unit trains to travel head-first into the silo, eliminating the need for engine switching. The loop is 8,340 feet long. It will be used and maintained throughout the C. V. Spur operation life.

There are seven (7) separate conveyor runs at the C. V. Spur. All grades for the conveyors are shown on Figure 3-7 of the MRP. All surface conveyors are covered and equipped with walkways. These conveyors will be used throughout the life of the C. V. Spur facility.

The transportation facilities are maintained and will be restored to prevent damage to fish, wildlife and related environmental values (stated in Section UMC 817.97 of the TA), as well as additional contributions of suspended solids to streamflow or runoff outside the permit area (outlined in UMC 817.41-.49 of the TA). In addition, they are maintained in a manner to control and

minimize degradation for water quality and quantity, control and minimize erosion and siltation as well as pollution (UMC 817.41-.49 of the TA). This is stated in Section 3.2.5.4, MRP, pages 3-29 to 3-30.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.181 Support Facilities and Utility Installations

Existing Environment and Applicant's Proposal

All buildings and structures at the C. V. Spur are shown on Plates 3-1 and 3-2 of the MRP.

There are no present plans to modify or reconstruct any structures at this site as stated in Section 3.2.2 (MRP, page 3-2).

It is stated in Section 3.2.1.1 (MRP, page 3-1) that all of the support facilities listed will be maintained and used in a manner which prevents damage to fish, wildlife and related environmental values (UMC 817.97 of the TA) and prevents additional contributions of suspended solids to streamflow or runoff outside the permit area (UMC 817.41-.49 of the TA).

Compliance

The applicant complies with this section.

Stipulations

None.

76870

## RECLAMATION COST SUMMARY

Beaver Creek Coal Company  
C. V. Spur Preparation Plant  
ACT/007/022, Carbon County, Utah

July 13, 1984

1. Removal Structures	\$1,036,437.00
2. Grading and Ripping	312,278.00
3. Revegetation Activities	397,750.00
4. Foreman Supervising Activities	87,780.00
	\$1,834,245.00
10% Contengency	\$ 183,424.00
	\$2,017,669.00 - (1984 Dollars)

1985 - \$2,154,467  
1986 - \$2,300,540  
1987 - \$2,456,516  
1988 - \$2,623,068  
1989 - \$2,800,912

## SCHEDULE OF RECLAMATION

Upon completion of operations at C. V. Spur, the following approximate schedule will be followed for final reclamation. Time frames are approximate and may overlap, decreasing the overall time. The sequence of events may also be slightly altered. The procedure will begin within 180 days of termination of operations.

### PROCEDURE, TIME FRAME, ACCUMULATIVE TIME

<u>PROCEDURE</u>	<u>TIME FRAME</u>	<u>ACCUMULATIVE TIME</u>
Remove Structures	44 weeks	44 weeks
Reclaim Areas	18 weeks	62 weeks
Topsoil and Soil Placement	4 weeks	66 weeks
Reseeding	2 weeks	68 weeks
Mulching	2 weeks	70 weeks
*Removal of Sediment Ponds and Diversions	2 weeks	

\*To be completed after the revegetation cover meets the standards described in Section 3.5.3.1.

COST OF RECLAMATION

A detailed estimate of the costs of reclamation at C. V. Spur is presented below. The following is a list of equipment and rates used in developing the cost estimate.

<u>ITEM</u>	<u>RATE</u>
End-Dump Truck + Operator	$\$370 + \$194.80 \text{ (OP cost)} \times 1.1 =$ $\$621.28 + \$178.00 \text{ (Labor)} =$ $\$799.28/\text{day}$
Front-End Loader (988) + operator	$\$1,320 + \$402 \text{ (OP cost)} \times 1.1 =$ $\$1,894.20 + \$227.60 = \$2,121.80/\text{day}$
Cat + Operator (D-9)	$\$1,275 + \$292.40 \text{ (OP cost)} \times 1.1 =$ $\$1,724.14 + \$227.60 = \$1,951.74/\text{day}$
Crane + Operator (Grove RT-75S 50T)	$\$810 + \$197.60 \text{ (OP cost)} \times 1.1 =$ $\$1,108.36 + \$232.80 = \$1,341.16/\text{day}$
Backhoe + Operator (Cat 235)	$\$1,440 + \$263.60 \text{ (OP cost)} \times 1.1 =$ $\$1,873.96 + \$227.60 = \$2,101.56/\text{day}$
Laborer	$\$21.95/\text{hr} = \$175.60/\text{day}$
Equipment Operator (medium)	$\$28.45/\text{hr} = \$227.60/\text{day}$
Mobilization and Demobilization	$\$4,000.00$
Equipment Operator (crane)	$\$29.10/\text{hr} = \$232.80/\text{day}$
Foreman	$\$31.35/\text{hr} = \$250.80/\text{day}$

COST ESTIMATE FOR C. V. SPUR RECLAMATION

Procedure

Removal Structures

A. Silo

2 trucks + operator X 25 days X \$799.28/day =	\$ 39,964.00
1 loader + operator X 25 days X \$2,121.80/day =	53,045.00
1 cat + operator X 10 days X \$1,951.74/day =	19,517.90
10 laborers X 30 days X \$175.60/day =	52,680.00
	<u>\$165,206.40</u>

B. Stacking Tubes (4)

2 trucks + operator X 15 days X \$799.28/day =	\$ 23,978.40
1 loader + operator X 15 days X \$2,121.80/day =	31,827.00
1 cat + operator X 10 days X \$1,951.74/day =	19,517.00
10 laborers X 20 days X \$175.60/day =	35,120.00
	<u>\$110,442.40</u>

C. Thickener

2 trucks + operator X 8 days X \$799.28/day =	\$12,788.48
1 loader + operator X 8 days X \$2,121.80/day =	16,974.40
1 cat + operator X 5 days X \$1,951.74/day =	9,758.70
10 laborers X 10 days X \$175.60/day =	17,560.00
	<u>\$57,081.58</u>

D. Plant

2 trucks + operator X 30 days X \$799.28/day =	\$ 47,956.80
1 loader + operator X 30 days X \$2,121.80/day =	63,654.00
1 cat + operator X 10 days X \$1,951.74/day =	19,517.40
1 crane + operator X 50 days X \$1,341.16/day =	67,058.00
10 laborers X 60 days X \$175.60/day =	105,360.00
	<u>\$236,555.78</u>

E. Conveyors (7)

1 crane + operator X 20 days X \$1,341.16/day =	\$26,823.20
2 trucks + operator X 10 days X \$799.28/day =	15,985.60
1 loader + operator X 10 days X \$2,121.80/day =	21,218.00
6 laborers X 20 days X \$175.60/day =	21,072.00
	<u>\$85,098.80</u>

F. Reclaim Tunnels (2)

2 trucks + operator X 10 days X \$799.28/day =	\$ 15,985.60
1 cat + operator X 15 days X \$1,951.74/day =	29,276.10
1 crane + operator X 10 days X \$1,341.16/day =	13,411.60
1 loader + operator X 20 days X \$2,121.80/day =	42,436.00
6 laborers X 20 days X \$175.60/day =	21,072.00
	<u>\$122,181.30</u>

G. Truck Dumps (2)

2 trucks + operator X 5 days X \$799.28/day =	\$ 7,992.80
1 crane + operator X 5 days X \$1,341.16/day =	6,705.80
1 loader + operator X 10 days X \$2,121.80/day =	21,218.00
6 laborers X 15 days X \$175.60/day =	15,804.00
	<u>\$51,720.60</u>

H. Railroad

2 trucks + operator X 10 days X \$799.28/day =	\$15,985.60
1 loader + operator X 10 days X \$2,121.80/day =	21,218.00
1 cat + operator X 5 days X \$1,951.74/day =	9,758.70
6 laborers X 15 days X \$175.60/day =	15,804.00
	<u>\$62,766.30</u>

I. Lab/Shop/Warehouse

2 trucks + operator X 10 days X \$799.28/day =	\$15,985.60
1 loader + operator X 10 days X \$2,121.80/day =	21,218.00
1 crane + operator X 5 days X \$1,341.16/day =	6,705.80
1 cat + operator X 3 days X \$1,951.74/day =	5,855.22
6 laborers X 15 days X \$175.60/day =	15,804.00
	<u>\$65,568.62</u>

J. Sample Building

2 trucks + operator X 3 days X \$799.28/day =	\$ 4,795.68
1 loader + operator X 3 days X \$2,121.80/day =	6,365.40
1 crane + operator X 3 days X \$1,341.16/day =	4,023.48
1 cat + operator X 1 day X \$1,951.74/day =	1,951.74
4 laborers X 5 days X \$175.60/day =	3,512.00
	<u>\$20,648.30</u>

K. Pump House

2 trucks + operator X 2 days X \$799.28/day =	\$ 3,197.12
1 loader + operator X 2 days X \$2,121.80/day =	4,243.60
1 cat + operator X 2 days X \$1,951.74/day =	3,903.48
4 laborers X 4 days X \$175.60/day =	2,809.60
	<u>\$14,153.80</u>

L. River Pump System

2 trucks + operator X 1 day X \$799.28/day =	\$1,598.56
1 loader + operator X 1 day X \$2,121.80/day =	2,121.80
1 cat + operator X 1 day X \$1,951.74/day =	1,951.74
2 laborers X 2 days X \$175.60/day =	702.40
	<u>\$6,374.50</u>

M. Water Tank

1 crane + operator X 2 days X \$1,341.16/day =	\$2,682.32
2 trucks + operator X 2 days X \$799.28/day =	3,197.12
2 laborers X 3 days X \$175.60/day =	1,053.60
	<u>\$6,933.04</u>

N. Substation

2 trucks + operator X 2 days X \$799.28/day =	\$3,197.12
1 loader + operator X 2 days X \$2,121.80/day =	4,243.60
2 laborers X 3 days X \$175.60/day =	1,053.60
	<u>\$8,494.32</u>

O. Subdrains

1 backhoe + operator X 3 days X \$2,101.56/day =	\$ 6,304.68
1 loader + operator X 3 days X \$2,121.80/day =	6,365.40
2 trucks + operator X 3 days X \$799.28/day =	4,795.68
2 laborers X 5 days X \$175.60/day =	1,756.00
	<u>\$19,221.76</u>

SUBTOTAL

\$1,032,437.50
\$ 4,000.00
<u>\$1,036,437.50</u>

Mobilization and Demobilization

Grading and Ripping

A. Refuse Piles

2 cats X 30 days X \$1,951.74/day =	\$117,104.40
-------------------------------------	--------------

B. Coal Storage Pads

2 cats X 10 days X \$1,951.74/day =	39,034.80
-------------------------------------	-----------

C. Plant Area

1 cat X 5 days X \$1,951.74/day =	9,758.70
-----------------------------------	----------

D. Truck Dump Grades

2 cats X 10 days X \$1,951.74/day =	39,034.80
-------------------------------------	-----------

E. Railroad Grade

2 cats X 20 days X \$1,951.74/day =	78,069.60
-------------------------------------	-----------

F. Backfilling Ponds (7)

1 cat X 15 days X \$1,951.74/day =	<u>29,276.10</u>
------------------------------------	------------------

\$312,278.40

Revegetation Activities

A. Topsoil and Soil Placement

2 loaders + operator X 30 days X \$2,121.80/day =	\$127,308.00
2 trucks + operator X 10 days X \$799.28/day =	15,985.60
	<u>\$143,293.60</u>

B. Seedbed Preparation

122.28 acres X \$200/acre = \$ 24,456.00

C. Seeding

5.28 X 379/acre = \$ 2,001.00

117 acres X \$544.69/acre

Hydroseed: Seed = \$444.69/acre

Labor = \$175.60/acre = \$ 63,729.00

D. Mulching (as required)

122.28 acres X \$350/acre = \$ 42,798.00

E. Fertilizing

122.28 acres X \$175.60/acre = \$ 21,472.00

F. Maintenance and Monitoring-\$10,000/yr for 10 yrs \$100,000.00

\$397,750.00

Supervision

Foreman to Supervise Activities \$1,254/wk X 70 wks = \$87,780.00

1. Labor figures are from the Building Construction Cost Data 1984 (subcontractors, including O & P)
2. Operating costs are from the Rental Rate Bluebook with a 10% added factor.
3. The 1984 figure was inflated at a rate of 6.8 percent. The preceding three years from the Means Historical Cost Index were used.
4. Native Plant Incorporated seed costs were used.

PERMANENT RECLAMATION SEED MIXTURE

Name	Rate (Pounds PLS/AC)	Price Per Pound	Total
<u>Grasses</u>			
Galleta ( <u>Hilaria jamesii</u> )	2	\$26.25	\$ 52.50
Thickspike wheatgrass ( <u>Agropyron dasystachyum</u> )	4	\$ 3.90	\$ 15.60
Indian ricegrass ( <u>Oryzopsis hymenoides</u> )	3	\$ 8.15	\$ 24.45
Alkali sacaton ( <u>Sporobolus airoides</u> )	.75	\$ 3.30	\$ 2.48
Inland saltgrass ( <u>Distichlis spicata</u> )	1	NA	NA
			<u>\$ 95.03</u>
<u>Forbs</u>			
Globemallow ( <u>Sphaeralcea grossulariaefolia</u> )	.5	\$45.00	\$ 27.50
Sunflower ( <u>Helianthus annuus</u> )	4	\$ 8.95	\$ 35.80
Palmer penstemon ( <u>Penstemon palmeri</u> )	.5	\$35.00	\$ 17.50
Yellow sweetclover ( <u>Melilotus officinalis</u> )	2	\$ .68	<u>\$ 1.36</u>
			\$ 82.16
<u>Shrubs</u>			
Winterfat ( <u>Ceratoides lanata</u> )	3	\$18.50	\$ 55.50
Shadscale ( <u>Atriplex confertifolia</u> )	4	\$ 8.00	\$ 32.00

Name	Rate (Pounds PLS/AC)	Price Per Pound	Total
<u>Shrubs (continued)</u>			
Matbush ( <u>Atriplex corrugata</u> )	4	\$15.00	\$ 60.00
Whitestem rubber rabbitbrush ( <u>Chrysothamnus nauseosus</u> var. <u>albicaulis</u> )	1.5	\$68.00	\$102.00
Four-wing saltbush ( <u>Atriplex canescens</u> )	<u>3</u>	\$ 6.00	\$ 18.00
			<u>\$267.50</u>
TOTAL (for broadcast or hydroseeding)	<u>33.25</u>		<u>\$444.69</u>

(1/2 rate for drill seeding)

PERMANENT RECLAMATION SEED MIXTURE  
PRICE RIVER SYSTEM

	Acreage 1 Pounds PLS/Acre	Price Per Pound	Cost	Number Seeds/Pound
Streambank wheatgrass	5	\$ 3.90	\$ 19.50	160,000
Tall wheatgrass	3	\$ .85	\$ 2.55	159,000
Alkali sacaton	2	\$ 3.30	\$ 6.60	1,750,000
Galleta	3	\$26.25	\$ 78.75	79,000
	<u>13</u>		<u>\$107.40</u>	

Containerized or Bare Root Stock

Number Per Acre

Rubber rabbitbrush	200 - \$158 (\$ .79 per plant)
Sandbar Willow	150 - \$118
	<u>\$279/acre</u>

## CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Beaver Creek Coal Company  
C. V. Spur Preparation Plant  
ACT/007/022, Carbon County, Utah

July 13, 1984

Under the criteria for permit approval or denial contained in UMC 786.19(c), the assessment of the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance must be made by the Division of Oil, Gas and Mining. A finding that the operations proposed within the application for underground coal mining activities have been designed to prevent damage to the hydrologic balance outside the proposed mine plan area must be made by the Division before a permit can be issued.

The purpose of this document is to provide a Cumulative Hydrologic Impact Assessment (CHIA) for Beaver Creek Coal Company's (BCCC) Castle Valley Spur Coal Processing and Loadout Facility (C. V. Spur). The area studied for this assessment and delineated later in this document is referred to as the Cumulative Impact Area (CIA).

### Description of CIA

The C. V. Spur is located approximately four (4) miles south-southeast of Price, Utah. The site is located in Castle Valley, a broad featureless plain lying between the Wasatch Plateau on the west and the San Rafael Swell on the east. The elevation at the site is approximately 5,500 feet with a surface topography which is nearly flat, gently sloping to the east towards the Price River. The CIA for this assessment is delineated on the attached location map. The "general area" requirements noted in UMC 786.19(c) were considered and are herein defined as including the actual permit area as well as that area which lies 1/4 mile downgradient of the general groundwater flow direction and 1/4 mile downstream of any surface water drainage from the permit area.

Surface water in and around C. V. Spur is ephemeral, with annual precipitation averaging 9.25 inches. Surface water courses which are perennial lie approximately one (1) mile or more away from the permit boundary. The Price River lies over one (1) mile to the northeast of the permit boundary. Miller Creek, a perennial stream, lies just under one mile due south of C. V. Spur.

Irrigation canals which feed from the Carbon Canal (1/2 mile west) pass to the north and south of the permit area and within the CIA.

Groundwater resources in the CIA appear to be quite limited. A system of shallow observation wells has been installed by BCCC on and adjacent to the C. V. Spur site to monitor water levels and quality. A french drain system is in place along the western and northern boundaries of the C. V. Spur permit area. Water from the french drain is used for plant water in the cleaning plant.

Well log data from oil and gas drilling in the area indicate that the only regional aquifer in the C. V. Spur CIA is the Ferron Sandstone, which lies approximately 500 feet below the surface.

The CIA lies on top of the Bluegate Shale member of the Mancos formation. The Mancos formation is comprised of approximately 5,000 feet of dark blue-gray shale. The Bluegate Shale is the middle member of three in the Mancos. The Bluegate is a dark blue-gray marine mudstone containing some thin lenses of shaley sandstone, sandy limestone and calcareous shale (C. V. Spur Mining and Reclamation Plan [MRP], page 6-2).

BCCC's core information from drilling on the C. V. Spur site (see Figure 6-3 of the MRP) showed that the upper 20 feet consists primarily of weathered brown clay. At a depth below 20 to 25 feet, the Bluegate is generally comprised of a dark blue-gray dense mudstone.

The history of coal mining within the CIA is contained in Section 1.1 and 2.2.6 of the C. V. Spur MRP. The C. V. Spur site, prior to 1977, was owned by Utah Power & Light Company (UP&L), and operated as a coal loadout. Swisher Coal Company purchased the site on November 11, 1977 and construction of preparation plant facilities were undertaken shortly thereafter. The Atlantic Richfield Company acquired Swisher Coal Company on December 31, 1979. BCCC, a wholly owned subsidiary of ARCO, currently operates the C. V. Spur facility. Approximately 1,000,000 tons of coal per year are currently handled through the facility.

In addition to the C. V. Spur operation, the COP Development Company has acquired land immediately adjacent to the north of the C. V. Spur site. COP intends to build a coal loadout facility on the property. The exact nature and extent of this operation is not known at this time. This is the only potential future mining operation which may occur inside the CIA boundary.

#### Areas of Significant Concern

No surface water quality or quantity concerns exist for the C. V. Spur operation. This is primarily based on the fact that the C. V. Spur facility operates without surface water discharges. Water retained in the sedimentation system is utilized for preparation plant water.

Additionally, since there are no underground workings at the C. V. Spur site, impacts to groundwater quantity are not a major concern.

The only concern identified in this CHIA is the possible impacts to groundwater from the coal refuse material which is disposed of on-site. A study performed by White, Ostler and McKell (1982) showed that at least one refuse pile at another site in Carbon County, Utah, had a significantly acidic pH. In general, the study noted that the older the refuse, the lower the pH.

While the information in the 1982 study is clearly not conclusive, with results dependent on site specific conditions, the fact that the deleterious effects of toxic pH levels may not be apparent for 50 to 60 years demands that this issue be adequately analyzed in the earliest possible stages of the permitting process.

#### Study Approach

In conducting this analysis, the data for groundwater and the chemical composition of refuse material on site which are contained in the C. V. Spur MRP were relied on heavily. No other site specific data were available.

Additionally, a literature survey of existing water quality and quantity studies on the Price River was undertaken.

#### Analysis and Results

A review of available data on the surface water adjacent to the C. V. Spur site reveals that relatively high total dissolved solids (TDS) levels are common throughout the year with sulfate ( $SO_4$ ) the predominant ion.

U. S. Geological Survey (USGS) Selected Hydrologic Data (1978) for 1931-1977, show TDS values for the Price River near C. V. Spur ranging from 2,310 milligrams per liter (mg/l) to 2,800 mg/l. Dissolved sulfate values range from 800 to 1,400 mg/l with pH values at 8.1 and 8.2.

Additional insight into the chemical quality of surface waters can be garnered from Technical Publication No. 34, Utah Department of Natural Resources (1972). TDS values for the Price River at Price and at Wellington as well as Drunkards Wash and Miller Creek near Wellington range from 380 to 6,220 mg/l. The TDS values for Drunkards Wash and Miller Creek were generally higher than the Price River values. pH values were primarily within the 7.6 to 8.2 range.

The chemical water quality of the Price River by the time it reaches Woodside, Utah, has degraded significantly. Water quality data for the Price River at Woodside (USGS 1968, 1972) for water years 1968 and 1972 show TDS levels and sulfate levels which are generally significantly higher than values upstream. This can largely be attributed to the Mancos shale which the river flows over once it reaches the Price area.

BCCC currently undertakes groundwater monitoring via a system of monitoring wells on and adjacent to the C. V. Spur site. The quality of groundwater in the CIA is reflected in the summary data contained in the C. V. Spur MRP (pages 7-15 to 7-51). Once again, TDS and sulfates are significant in that the levels observed consistently exceed even the agricultural numerical quality standards for the Price River below Castlegate (page 7-53, C. V. Spur MRP). In addition, manganese, chloride and occasionally iron levels also exceed the agricultural numerical limits. pH values were alkaline, ranging from 7.0 to 7.9 and averaging 7.6. The poor chemical quality of the groundwater in the CIA is largely attributable to the Mancos shale.

Based on the poor naturally occurring water quality of surface and subsurface waters in the CIA, impacts of surface discharges should they occur are greatly diminished. The potential for impacts is reduced even further in light of the fact that the C. V. Spur operation does not discharge off-site.

BCCC has provided analysis of the coal refuse material which is being disposed of at the C. V. Spur site. The refuse material is characterized by percent sulphur levels of 0.47 percent, pH values of 7.8 and acidity levels as  $\text{CaCO}_3$  of 10 to 15 mg/l (page 3-10 to 3-13, C. V. Spur MRP).

In performing this analysis, it is also important to take into consideration the nature of the soil profile beneath and adjacent to the refuse disposal area. If the refuse material did produce acidified runoff or leachate, the neutralizing potential of the soil beneath and adjacent to the refuse disposal site would determine in part if there was a significant impact.

Section 8 of the C. V. Spur MRP characterizes the nature of the soils on site. From Plate 8-1 of the MRP, it appears that most of the area beneath where refuse is being and will be disposed of is characterized as "disturbed land." The texture of this material for the first 12 inches is a sandy loam with material from 12 to 60 inches being a silty loam.

Values for pH for the "disturbed land" are 7.1 for 0-12 inches and 7.6 for 12 to 60 inches. It is important to note that sodium levels are high for this soil, most likely resulting in a dispersed soil with low permeability.

Given the data which are available for the refuse material as well as data for surface and groundwater on and adjacent to the C. V. Spur site, it is concluded that:

1. The refuse material will not pose a long-term acidity problem.
2. The soil and water will not be impacted even if some acid drainage occurred.

These conclusions are based on the following:

- A. The chemical nature of the refuse material is low in sulphur content which, if present in high levels, would be the source of acidity.
- B. The pH value for the refuse at 7.8 is alkaline.
- C. The soils beneath and adjacent to the refuse disposal area are alkaline in nature, thereby counteracting any acidity potential from the refuse material.
- D. The permeability of the soils in and adjacent to the C. V. Spur site are typically low, thereby reducing any movement of impacts from the refuse material into the local groundwater system.
- E. The annual rainfall level for C. V. Spur, at 9.25 inches, is significantly arid such that the chemical reactions typically associated with pyritic materials oxidizing and producing acid by-products would be severely hindered.
- F. The water quality and pH values of surface and groundwater are sufficiently alkaline that impacts from refuse acidity, if it should occur, would be quickly buffered by the natural system.

### Findings

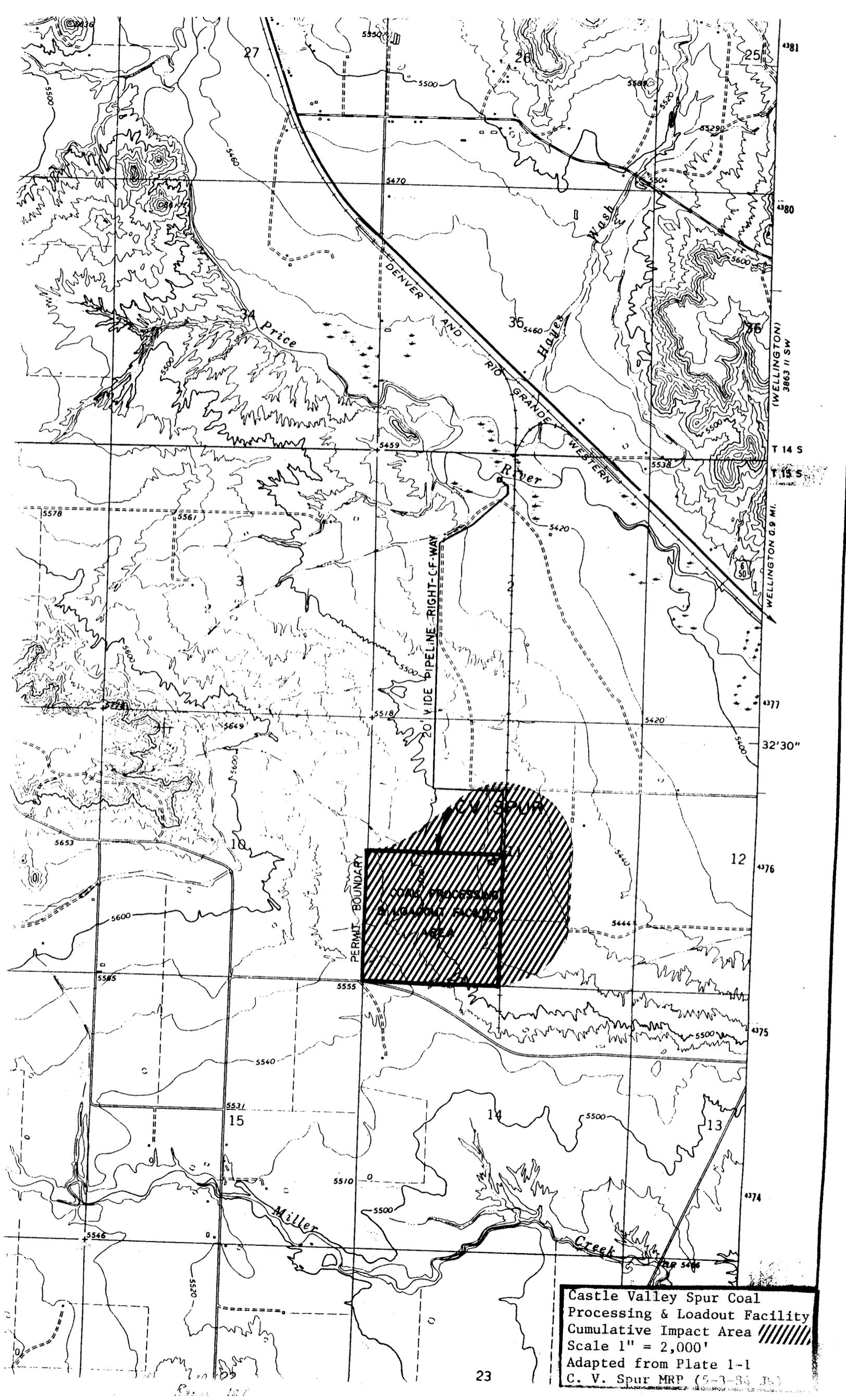
No material damage is anticipated during or after surface mining activities at the C. V. Spur site.

No impacts to surface waters on or adjacent to the site are expected based on the no discharge operation conducted by BCCC. Should occasional discharges occur, the impacts should be minimal based on the distance from the site to any active watercourse.

No impacts to groundwater on or adjacent to the site are predicted based on the alkaline nature of the refuse material and soils beneath and adjacent to the refuse disposal site. Additionally, the low annual precipitation levels at the site will tend to restrict any leaching or seepage off refuse material.

## BIBLIOGRAPHY

- Castle Valley Spur Coal Processing and Loadout Facility Permit Application. Beaver Creek Coal Company (Final Revision April 1984).
- Department of Natural Resources, State of Utah. 1972. Reconnaissance of Chemical Quality of Surface Water and Fluvial Sediment in the Price River Basin, Utah. Technical Publication No. 34.
- U. S. Geological Survey. 1968. Water Resources Data for Utah, Part 2, Water Quality Records.
- U. S. Geological Survey. 1972. Water Resources Data for Utah, Part 2, Water Quality Records.
- U. S. Geological Survey. 1978. Selected Hydrologic Data 1931-1977. USGS Open File Report 78-121.
- White, Susan M., Ostler, W. K., and McKell, C. 1973. Coal Refuse - An Increasingly Serious Problem for Colorado Plateau Coal Production. Plant Resources Institute (Native Plants). Prepared for Department of Energy, Division of Coal Mining, FE-24, Washington, D. C.



Castle Valley Spur Coal  
 Processing & Loadout Facility  
 Cumulative Impact Area   
 Scale 1" = 2,000'  
 Adapted from Plate 1-1  
 C. V. Spur MRP (5-3-34, II)