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State of Utah
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DIVISION OF OIL, GAS AND MINING

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Michael O. Leavitt
Governor
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Division Director

August 25, 1998

Rick Olsen, General Manager
Soldier Canyon Mine
P.O. Box 1029
Wellington, Utah 84542

Re: Technical Analysis with Deficiencies, Dugout Phase II Application, Canyon Fuel Company, Inc., Dugout Canyon Mine, ACT/007/039, Folder #3, Carbon County, Utah

Dear Mr. Olsen:

The Division has completed a Technical Analysis (TA) of the Dugout Phase II Permit Application Package and you will find it enclosed for your information and files. The purpose of this TA is to determine the Technical Adequacy of your application. As you will note, there are a few areas of deficiency in your application that prevent us from approving it at this time. Please review the TA carefully to make sure you understand the concerns. The deficiencies will need to be adequately addressed before your application can be approved. In order for us to further process your application, please provide a response by no later than October 26, 1998.

Please call if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Daron R. Haddock".

Daron R. Haddock
Permit Supervisor

tam
Enclosure: Technical Analysis
cc: M. Sufflita
S. Demczak
Chris Hansen (Canyon Fuel)
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State of Utah
Division of Oil, Gas and Mining
Utah Coal Regulatory Program



Technical Analysis and Findings
Dugout Canyon Mine
ACT/007/039
Phase Two Review
August 25, 1998

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INTRODUCTION

Revision- August 25, 1998

INTRODUCTION

This Technical Analysis (TA) is written as part of the permit review process. It documents the Findings that the Division has made to date regarding the application for a permit and is the basis for permitting decisions with regard to the application. The TA is broken down into logical section headings which comprise the necessary components of an application. Each section is analyzed and specific findings are then provided which indicate whether or not the application is in compliance with the requirements.

Often the technical review of an application finds that the application contains some deficiencies. The deficiencies are discussed in the body of the TA and are identified by a regulatory reference which describes the minimum requirements. In this Technical Analysis we have summarized the deficiencies at the beginning of the document to aid in responding to them.

It may be that not every topic or regulatory requirement is discussed in this version of the TA. Generally only those sections are analyzed that pertain to a particular permitting action. TA's may have been completed previously and the revised information has not altered the original findings. Those sections that are not discussed in this document are generally considered to be in compliance.

On March 16, 1998 the Division issued a mining permit to Canyon Fuel Co. for the operation of Dugout Canyon Mine. On May 1, 1998 the Division received an application for a significant revision to the Mining and Reclamation Plan. This Technical Analysis is the result of the review of that revision by the entire DOGM team assigned to the mine. This TA supersedes the previous one of March 16, 1998.

SUMMARY OF DEFICIENCIES

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SUMMARY OF OUTSTANDING DEFICIENCIES

The Technical Analysis regarding the proposed permit changes is not complete at this time, pending submittal of additional information by the applicant and further review by the Division, to address outstanding deficiencies in the proposal. A summary of those outstanding deficiencies is provided below. Additional comments, concerns and deficiencies may also be found within the analysis and findings made in this Draft Technical Analysis which have not been presented in this summary. Upon finalization of this review, any outstanding deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the Division, result in denial of the proposed permit changes, or may result in other executive or enforcement action as deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.

Accordingly, the applicant must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

- R645-301-521.140**, The applicant must give the Division a copy of the BLM lease the NW 1/4, SW 1/4 of Section 23, T. 13S., R. 12 E. prior to the Division approving Phase II. The applicant must include the BLM lease area in the permit area on all maps and plates.
- R645-301-521.190**, The applicant must give the Division a legal description of the permit boundaries including the total acreage, the amount of federal, state and fee acreage.
- R645-300-124.330**, The information in Appendix 4-1 must be kept confidential and should be placed in the confidential file.
- R645-301-322**, A report about bats in the area incorrectly lists the status of the Townsend's big eared bat and the spotted bat. The report should be corrected or the application should contain a statement giving correct information.
- R645-301-622** - Plate 6-3 and Figure 6-1 are listed in the Table of Contents of the proposed Phase II MRP and referred to in the text, but they are not in the proposed MRP. These two cross-sections are assumed to be the same as those in the current MRP, but the applicant needs to assure that copies are in the Phase II MRP.
- R645-301-724, -728.100, -728.400**, Baseline water-monitoring data obtained since the original PAP was prepared: these data need to be included in the proposed amendment to the MRP and evaluated as part of the PHC determination.
- R645-301-732.121, -732.312**, There is no SPCC in the MRP nor any indication a SPCC has been prepared for the Dugout Canyon Mine, but a commitment to prepare a SPCC is on page 7-50.
- R645-300-124.130**, Information in Appendix 4-1 needs to be kept confidential.

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- R645-301-323.100**, The range site reference areas need to be shown on maps.
- R645-301-521.151**, The applicant did not show the contours lines extending at least 100 feet from the disturbed area boundaries on Plate 5-4.
- R645-301-521.141**, The applicant did not give the Division a detailed map of the proposed mine workings. The Division needs a detailed mine map similar to those required to MSHA.
- R645-301-521.163**, The applicant did not show the correct disturbed area boundaries on the maps. Some of the areas in Phase I were not included in Phase II. All disturbed areas in Phase I must be included in Phase II. The applicant shows areas in the proposed BLM lease in the permit area. The Division cannot approve Phase II until the lease is granted. The Division is aware that the applicant is anticipating the BLM to grant the lease.
- R645-301-113**, The applicant needs to supply complete right of entry information for the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 23, Township 13 South, Range 12 East.
- R645-301-121.200**, The applicant needs to correct typographic errors on Plate 7-5, page 7-65, Plate 7-4, and all plates with an incomplete road.
- R645-301-121.200**, The applicant must clarify the statement about how no buildings exist at the site. See R645-301-121.200. To avoid confusion the Division recommends that the applicant place the information about the existing structures in a new subheading. The new subheading could be entitled Section 526.100 Existing Structures. By placing the information in a separate subheading the reader would understand what structures existed before January 21, 1981.
- R645-301-526.100**, The applicant must list the existing structures that will be used at the mine site. Existing structures include but are not limited to the existing power line and how it will be upgraded and the roads that will be used to access monitoring and data collection sites.
- R645-301-526.116**, The applicant must update the MRP with a description of the county road within the disturbed area and what steps will be taken to protect the public.
- R645-301-525.420**, The applicant needs to give the Division a detailed mine maps similar to those given to MSHA.
- R645-301-333**, Because the applicant is aware of raptor nests in the subsidence area for the first permit term, it is possible to begin developing methods of avoidance, protection or removal, and determining mitigation plans. These plans should be included in the mining and reclamation plan. Coordination of plans needs to include the Fish and Wildlife Service.
- R645-301-234**, a designated location for the storage of the additional topsoil to be generated by the expansion of Phase II. The present capacity of existing storage location (17,000 CY) will be exceeded by approximately 11,455 CY.
- R645-301-232.100** Descriptions of topsoil and subsoil removal and estimates of salvage volumes during Phase II should include the two locations as discussed during a technical site visit on August 5, 1998 and as described above under the **Topsoil and Subsoil** heading.
- R645-301-527.200**, The applicant has not met the minimum regulatory requirements of this section.

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The applicant must show the location of the primary and ancillary roads on Plate 5-3 are required by R645-301-527.200.

- R645-301-527.200**, The applicant has not met the minimum regulatory requirements of this section. The applicant must provide the Division with typical cross section for the survey monument road as required by R645-301-527.200.
- R645-301-121.200**, The applicant must change the reference of Plate 5-2A to Plate 5-2 in the MRP.
- R645-301-534.130**, The applicant must use cross sections in the stability analysis that are similar to field conditions. The applicant must also include an stability analysis for the survey monument road.
- R645-301-121.200**, The applicant needs to clarify if they want the amendment 98C incorporated into Phase II. If the applicant wants amendment 98C incorporated into Phase II then they need to amend Phase II.
- R645-301-536.500 and R645-301-521.190** The applicant did not provide the Division with proof that MSHA has approved the plan to dispose of coal mine waste underground. Since the Applicant provided all other information the Division should approve the underground disposal of coal mine waste on the condition that prior to underground disposal the applicant show MSHA has approved the plan.
- R645-301-724, -728.100**, Operational water-monitoring data obtained since the original PAP was prepared: these need to be included in the proposed amendment to the MRP and evaluated as part of the PHC determination.
- R645-301-121.200**, Clarify what appears to be a typo at the bottom of page 7-57: instead of "Table 7-4" (the ground-water monitoring parameters) it seems it should be "Table 7-5" (the surface-water monitoring parameters).
- R645-301-731**, For springs, Tech-004 recommends one water quality sample at low flow every fifth year, during either the year preceding re-permitting or at midterm review, to be analyzed for baseline parameters. For other ground-water quality monitoring sites, one sample anytime during the same year. There is no prevision for this sampling and analysis in the operational ground-water monitoring plan.
- R645-301-731**, For surface water, Tech-004 recommends one water quality sample at low flow every fifth year, during either the year preceding re-permitting or at midterm review, to be analyzed for baseline parameters. There is no prevision for this sampling and analysis in the operational surface-water monitoring plan.
- R645-301-742.311**, Provide culvert design information for the undesignated culvert at the downstream end of the disturbed area. The design must consider alignment with the energy dissipator and side drainage inflows.
- R645-301-752.100**, The undesignated culvert must have a description of how it will be dealt with at reclamation. Will it be removed or left? How does this fit into post-mining land use? Who is responsible for maintenance after reclamation if it is left?

SUMMARY OF DEFICIENCIES

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- R645-301-742.240**, Redesign ASCA-1 and ASCA-2 to fit the site conditions and contemporaneously reclaim the areas that are no longer maintained.
- R645-301-731.121, and 742.120**, Removal of silt fences at the lower end of the disturbed area across Dugout Creek will be done only after completion of all construction. Straw bales will be installed according to the Best Technology Currently Available as provided in current design methods. Provide riprap erosion protection at the outlets of DC-8 and DC-9.
- R645-301-524**, The Division should approve Section 534 of the MRP with the stipulation that prior to any surface blasting the applicant first has their blasting plan approved by the Division.
- R645-301-521.141**. The applicant did not provide the Division with detailed mine workings maps. The Division needs detailed mine workings maps similar to those required by MSHA
- R645-301-412.200**, The applicant needs to provide comments from the Bureau of Land Management concerning the postmining land use.
- R645-301-553.100**, Before approval the applicant must submit plans for placing topsoil on slopes steeper than 2:1, ripping slopes that are steeper than 3:1 and alternatives to using tractors on slopes steeper than 3:1.
- R645-301-553.100**, Before approval the applicant must submit a detailed slope stability analysis to the Division. The slope stability analysis must include the physical characteristic of the imported fill, give supporting evidence to the assumption that pore pressure will not be a factor in slope stability (the slope up the canyon failed during a high rainfall year) and stability analysis will be done on a slope similar to those that will be constructed during reclamation (an assumption in the stability analysis is that the maximum slope height will be 30 feet but some slopes shown on Plate 5-6 are higher than 30 feet).
- R645-301-542.730**, Before approval the applicant must submit a detailed plan for how coal mine waste that will be used for construction of the pad will be disposed.
- R645-301-242**, The soils salvaged from the culvert expansion, 1,568 CY, were included in the soil redistribution depths in Appendix 2-6, but should not have been, since these soils will be returned to the reclaimed channel area. This reduces the reclamation topsoil depth to 13.6 inches. Appendix 2-6 should be modified to reflect the segregation and selective replacement of the riparian area soils.
- R645-301-233**, Specific locations of erosion control matting use should be identified in the MRP and calculated into the bonding. Other possible soil stabilization techniques for slopes greater than 2:1 should be stated, should erosion control matting be eliminated from the plan.
- R645-301-240**, The MRP should be revised to indicate that all slopes will receive topsoil. Slopes which will not receive topsoil should be identified on the Reclamation Topography Map, Plate 5-5.
- R645-301-121.200, -731.214**, Clarification of when reclamation ground-water monitoring will end; monitoring until 2 years following the completion of surface reclamation activities will not coincide with bond release.
- R645-301-752.100**, The undesignated culvert must have a description of how it will be dealt with at reclamation. Will it be removed or left? How does this fit into post-mining land use? Who is

SUMMARY OF DEFICIENCIES

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responsible for maintenance after reclamation if it is left?

R645-301-600, Provide a description of the stream buffer zones to be established and maintained during reclamation.

R645-301-732, Provide the same level of interim sediment control during reclamation as was used during construction, namely a minimum of four silt fences at the lower end of the site.

R645-301-341, The applicant has committed to rip regraded areas to a maximum of two feet deep, but the plan needs to show a minimum ripping depth or other method of relieving compaction.

R645-301-341, Section 553.100 says all slopes steeper than 3h:1v will be gouged with a trackhoe, but Chapter 3 indicates some slopes may be treated with dozer tracking. This contradiction needs to be eliminated. Dozer tracking is not an acceptable treatment since it is likely to lead to smooth, steep slopes where rill and gully erosional features will develop. This is a requirement of condition 21 of the March 16, 1998, permit.

R645-301-341.210, The applicant needs to clarify which seed mix will be used in the mitigation area above the mine site.

R645-301-341.210, The number of willows to be planted in the riparian area needs to be increased to about 4000 per acre. Because the entire area may not be suited for planting willows, the applicant may need to qualify the commitment based on appropriate planting areas. This requirement is part of condition 16 of the March 16, 1998, permit.

R645-301-356, The applicant needs to either sample the pinyon/juniper and riparian areas in accordance with the Vegetation Information Guidelines requirements for final bond release or commit to selecting range site reference areas with cover at least as great as found in the disturbed area.

R645-301-542.310, The applicant must include all disturbed areas in Phase I in the Phase II disturbed area. The maps must be revised to show the correct disturbed area boundaries.

R645-301-830.140, The applicant needs to give the Division a detailed reclamation cost estimate. Part of the detailed reclamation cost estimate is the backfilling and grading plan. Since the backfilling and grading plan is inadequate the Division cannot determine the earthwork costs. Therefore, the reclamation cost estimate is inadequate.

ENVIRONMENTAL RESOURCE INFORMATION

ENVIRONMENTAL RESOURCE INFORMATION

GENERAL

Regulatory Reference: R645-301-411, -301-521, -301-721.

Analysis:

A general description of the mine site can be gathered from the description of the environmental resources under each major subject heading. The Dugout Canyon Mine is located within Dugout Canyon in the northern Book Cliffs - Roan Plateau region. Elevation of the mine facilities area ranges between approximately 7000 and 7150 feet above MSL. The permit area has been primarily utilized as rangeland for livestock and wildlife habitat. Some crops related to the livestock industry have been developed along the creek bottoms adjacent to Soldier Creek Road. However, no crops have been raised within the permit area. Recreational use of the permit area is limited due to lack of access through private property. Coal mining has occurred within Dugout Canyon since 1925. D. J. Collins prospected for and initially hand-developed the Red Glow Mine in the Gilson seam on the east side of Dugout Canyon in 1925. The west side of Dugout Canyon was first mined in 1952 by E.S.O. Coal Company when they mined the Rock Canyon seam.

The Knight Ideal Coal Company mined the Rock Canyon and Gilson coal seams located on both sides of the canyon between 1958 and 1964. Knight Ideal Coal Company extracted 1,326,000 tons of coal by conventional room and pillar method with partial pillar recovery. The area in Dugout Canyon disturbed by mining has changed hands through the years but no coal has been extracted since 1964.

Findings:

General resource information is considered adequate to meet the requirements of this section.

PERMIT AREA

Regulatory Requirements: R645-301-521.

Analysis:

Plate 1-1 outlines current permit area. The applicant shows the location of a proposed lease area on Plate 1-1. Currently the BLM is processing the applicant request of a lease on the NW 1/4, SW 1/4 of Section 23, T. 13S., R. 12 E. All other plates in the amendment include the proposed BLM leased area within the permit boundary.

The Division realizes that the expansion of the surface facilities as proposed in Phase II is based on the assumption that the BLM will grant the lease. The applicant assumes that the BLM will approve the lease before the Division approving the Phase II amendment. Therefore, all of the plates except Plate 1-1 show the BLM proposed the lease in the permit area.

The Division will process the Phase II amendment on the assumption that the BLM will approve the lease. However, the Division will not approve the amendment until the BLM grants the lease.

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The permit boundaries on all plates except Plate 1-1 are incorrect. If the BLM approves the lease then Plate 1-1 would have incorrect permit boundaries and the other plates would have correct boundaries. Therefore, the applicant has not met the requirements of R645-301-521.140.

Besides having the permit boundaries shown on a map the Division needs to have the legal description for the permit area. The Division also needs to know to total acreage in the permit area and also the acreage of federal, state and fee lands in the permit area.

The right-of-entry information in Section 114 of the MRP contains some but not all of the information. The information in Section 114 describes the leases and fee lands that can be different from the permit boundaries. Complete information on the acreage is not presented in Section 114.

Under the requirements of R645-301-521.190 the applicant is required to give the Division other relevant information. The Division has determined that a legal description of the permit boundaries and acreages is relevant information that the Division needs.

Findings:

R645-301-521.140, The applicant must give the Division a copy of the BLM lease the NW 1/4, SW 1/4 of Section 23, T. 13S., R. 12 E. prior to the Division approving Phase II. The applicant must include the BLM lease area in the permit area on all maps and plates.

R645-301-521.190, The applicant must give the Division a legal description of the permit boundaries including the total acreage, the amount of federal, state and fee acreage.

HISTORIC AND ARCHAEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: R645-301-411

Analysis:

Appendix 4-1 provides a cultural resource evaluation of the Dugout Canyon Mine. An intensive archaeological surface evaluation of the mine area was conducted in 1980 under the direction of Eureka Energy Company by Archeological-Environmental Research Corporation (AERC). Four of the sites reported as being potentially eligible for listing in the National Register of Historic Places (NRHP) are in the area of the current proposed mine. The four sites include one prehistoric rock art locus (42 CB 92) and three historic coal mine loci: the Dugout Creek Mine (42 CB 2005/291), the Fish Creek Mine (42 CB 204/290), and the Pace Canyon Mine (42 CB 206/292/574). The Fish Creek Mine and the Pace Canyon Mine were subsequently determined to not be eligible for nomination to the NRHP.

Files at the State Historic Preservation Office, Bureau of Land Management Office, and records of the NRHP were consulted. Further field evaluations were conducted by AERC on the prehistoric rock art and the Dugout Creek Mine in November 1995. In this study, the Dugout Creek Mine was determined to not be eligible for inclusion on the NRHP due to the lack of context and cultural integrity.

Findings:

Information provided in the plan meets the minimum requirements of this section. However, prior to

ENVIRONMENTAL RESOURCE INFORMATION

approval and as soon as possible, the applicant must comply with the following requirement:

R645-300-124.330, The information in Appendix 4-1 must be kept confidential and should be placed in the confidential file.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: R645-301-724.

Analysis:

Climatological resource information is found in Appendix 4-2.

Meteorological and air quality data were collected from mid-1978 through mid-1980 at a monitoring station located near Wellington, Utah. The data included: suspended particulates, wind speed, wind direction, ambient temperature, precipitation, and relative humidity. Particulates were sampled for 24 hours every sixth day. Precipitation was recorded four times hourly; other meteorological data were recorded hourly. Monitoring equipment included two high volume samplers and an electronic weather station with strip chart recorders. Meteorological parameters were measured with an accuracy of $\pm 5\%$ of full scale output.

Additional information was collected for Price, Utah from the U.S. Department of Commerce, Environmental Service Administration. These data included means and extremes for temperature and precipitation for the years 1936-1965.

Findings:

Climatological resource information is considered adequate to meet the requirements of this section.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: R645-301-321

Analysis:

Numerous vegetation communities are represented within the proposed permit area. The permit area ranges in elevation from 7000 to 8600 feet. The plan describes the plant communities as having been heavily impacted by human activities. Baseline sampling was done on several of the vegetative communities within the permit area. Dr. Steve Richardson and Steven Viert conducted vegetation inventories in 1980, Dr. Patrick Collins surveyed the vegetation in 1996, and Patricia Johnston did further studies in 1997. The area proposed to be disturbed has been changed throughout the various studies. The permit area vegetation map (Plate 3-1) delineates broad vegetative communities within and surrounding the permit area. The plan describes vegetative cover, production and shrub density of the Douglas fir, mixed conifer, pinyon juniper, deciduous streambank, and shrub/grass/juniper communities within the permit and adjacent areas.

The pinyon/Utah juniper community had a total vegetative cover of 66 percent when sampled in 1997. Big sagebrush, pinyon and juniper were the dominant species by cover. Shrub density was 2300 stems per acre.

ENVIRONMENTAL RESOURCE INFORMATION

The riparian (deciduous streambank) community occurs within the proposed area to be disturbed. Generally, this community consists of deciduous trees and shrubs such as narrowleaf cottonwood, Rocky Mountain maple, Douglas fir, red-osier dogwood, woods rose and mountain snowberry. In 1997, total vegetative cover, including canopy, was 85 percent. Shrub density was 1625 stems per acre. Productivity of the understory in this community was measured at 912 pounds per acre in 1980. In 1997 the Natural Resources Conservation Service (NRCS) estimated the productivity was 1500 pounds per acre, and they rated the range condition as fair. In 1991 this community was described in fair to poor range condition by the Bureau of Land Management. A site visit in 1996 suggested the area had not been as heavily grazed as reported in the past but that it was still in a somewhat degraded condition. This community type is the most productive in terms of forage availability in the area.

The area of past disturbance is described as once dominated by pinyon and juniper, and it has a potential forage production of 800 pounds per acre. The proposed disturbed area was sampled in 1996 (excluding the riparian area). This area had been disturbed by past mining and coal exploration activities. The area was seeded after the exploration activities. The dominant shrub species by cover was big-tooth maple while rubber rabbitbrush had the greatest number of individuals present. The area is dominated by species that indicate the site has been disturbed. Yellow sweetclover contributed the most vegetative cover to the total cover of 37% (Appendix 3-1).

A literature review and field studies for the area indicate no threatened or endangered plant species are present or are likely to be present (Section 322.200). Field studies were conducted 1979 through 1984. A 1995 letter from Robert Thompson, Forest Service botanist, in Appendix 3-1 says there are no threatened or endangered plant species. The inventory conducted June 24, 1995, found canyon sweetvetch along Dugout Creek approximately one-half mile below the gate.

Permit conditions 11 and 12 of the March 16, 1998, permit required the applicant to modify the plant list on page 3-8 to reflect actual riparian species and to make Plates 3-1 and 3-1A consistent. The applicant has adequately responded to these conditions.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: R645-301-322.

Analysis:

All riparian areas are considered by Wildlife Resources to be of critical value for wildlife. By definition in R645-301-322.220, cliffs that support raptors are also considered habitats of unusually high value. Both critical summer and winter big game habitat is present in the permit area.

A fish and wildlife resources survey was conducted December 1979 through November 1981 for the proposed Sage Point-Dugout Canyon coal mining project (Appendix 3-3). Wildlife count data were collected along eight experimental and four control transects through four different vegetation types: riparian, desert shrub, pinyon/juniper and conifer-bush. Each transect monitored reptiles, non-game birds, big game, and

ENVIRONMENTAL RESOURCE INFORMATION

medium-sized and small mammals. Upland and migratory game birds were not documented in this study due to their low frequency of occurrence in the survey area. A limited number of macroinvertebrates was found in 1979, and, since the creek is not a fishery resource, further studies were not conducted.

Detailed information, such as numbers and species presence, was collected in these studies within the area proposed to be permitted at that time. Although this study has provided valuable site specific information, these data should not be considered as baseline information for the current mine plan. The permit and facilities areas are much smaller than they were in the earlier proposal. The study was designed to monitor the effects of coal mine development on wildlife and not to give a baseline description.

Appendix 3-3 contains two maps showing Carbon County deer and elk habitat. Portions of the permit area contain critical winter and summer deer habitat. Elk habitat is classified as high value winter and yearlong habitat. The Division of Wildlife Resources (DWR) says in an April 1996 letter that much of the area is classified as critical deer winter range and is heavily used by deer and occasionally by elk and antelope. Mule deer in the area are considered part of Herd Unit 11b and the elk as part of Herd Unit 11b. Designated critical range and/or any riparian areas are considered high value habitats for wildlife.

Section 322.200, Site-specific Resource Information, says that no threatened or endangered plant or wildlife species were discovered in recent inventories by DWR, the Forest Service, or other qualified personnel. Three listed species (black-footed ferret, bald eagle, and peregrine falcon) could potentially inhabit the area. The peregrine falcon has been observed in several recent surveys of the Carbon County area. No confirmed sightings of black-footed ferrets have occurred within Carbon County during 1995, 1996, and the first quarter of 1997 (Bill Bates, DWR, Section 322.200).

Raptor nest surveys were conducted by DWR in 1995 and 1997, and the plan includes results of a 1998 survey for birds of special interest. The nest locations identified in that survey are shown on Plate 3-2 (confidential file). Plate 3-2 shows that the permit area contains the following nests:

<u>Section 20</u>	1 prairie falcon nest (scrape?), old dilapidated
<u>Section 22</u>	1 active golden eagle nest
<u>Section 16</u>	1 golden eagle nest, old dilapidated 2 buteo or red-tailed hawk nests
<u>Section 23</u>	2 golden eagle nests, old dilapidated

Numerous active and tended golden eagle nests and prairie falcon scrapes are located outside but immediately adjacent to the permit area. No known raptor nests are within the area to be disturbed by facility construction although a pair of golden eagles is frequently seen soaring at the cliff edge in full view of the proposed facilities. (The other nests associated with the eagle pair using the active nest in Section 22 have not been observed.)

Appendix 3-3 contains a report for a survey of birds of special interest done at the mine site. A loggerhead shrike was tentatively identified in this survey, and golden eagles were flying in the area. No other species of special interest were identified. This satisfies the requirements of permit condition 3 in the March 16, 1998, permit.

A bat survey of the proposed disturbed area was conducted in September 1997. A few bats were found in the area; however, the spotted bat and Townsend's big eared bat (both listed in the survey as Category 2) were not found nor potential habitat. Additional surveys will be conducted in the zone of potential subsidence. Plate 3-3 shows the locations of escarpments within the permit area. The plan says, ". . . no data or definition was available to determine the criteria for an area to be classified as of 'unusually high value' for bats." High

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value habitat is considered as habitat critical to the existence of the animal. Cliff escarpments are considered unusually high value for bats and raptors. The information in the application satisfies the requirement of condition 13 of the March 16, 1998, permit.

Most of the basic information in the bat survey about the status classifications of Townsend's big-eared and spotted bats is incorrect. The study says spotted bats are classified as a category 2 species for listing as threatened or endangered, but this category has not existed for about two years. Also, the Utah Natural Heritage Program ranking is shown as G4SI, but the actual ranking is G4S2.

Townsend's big-eared bats are also ranked as G4S2, but the study says the ranking is SX. The SX ranking would mean the species is extirpated or extinct, but George Oliver of the Natural Heritage Program said he considers Townsend's big-eared bats to be widespread, fairly common, and present in most habitats. The report also says UDWR considers it a category 2 species, but this ranking is not given by Wildlife Resources.

The plan should contain a statement showing the correct status of these species.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section of the regulations. Prior to approval, the applicant must provide the following in accordance with:

R645-301-322, A report about bats in the area incorrectly lists the status of the Townsend's big eared bat and the spotted bat. The report should be corrected or the application should contain a statement giving correct information.

SOILS RESOURCE INFORMATION

Regulatory Reference: R645-301-411, -301-220.

Analysis:

Chapter 2, Soils, Sections 220 through 224, discusses the soil resources within the proposed Dugout Canyon Mine disturbances. Relevant soils information includes current and published soil surveys, characterizations, and substitute topsoil identification. The Analysis section discusses resource information as follows:

- Soil Survey Information
- Disturbed Soils
- Undisturbed Soils
- Soil Productivity
- Substitute Topsoil

Soil Survey Information

Soil survey information is provided by both a general-area Order-III and a site-specific Order-I soil

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surveys. The Order-III survey is reproduced from the SCS "Soil Survey of the Carbon County Area" and is delineated on a general area soils map (Plate 2-1). According to the SCS soil survey, soils present on the east/south-east facing slopes of Dugout Canyon are part of the Rock outcrop-Rubbleland-Travessilla complex (#96) while those on the west/north-west facing slopes are shown as Croydon loam (#21) at lower elevations and Midfork family-Comodore complex (#62) at higher elevations in the upper reaches of the canyon. The SCS map (#11) shows a subjective line that separates the #21 soil from the #62 soil with no apparent vegetation break separating the soils. Mr. Leland Sassar, Soil Scientist, NRCS, was contacted on 3/3/98 concerning the apparent discrepancy and lack of coherency for placing #21 soils on steeper, Douglas-fir dominated slopes. Mr. Sassar indicated that some #20 (Comodore-Datino Variant Complex) soils probably exist within the #21 soils. The #21 soils are characterized as higher-elevation, non-rocky, deep loams, dominated by quaking aspen, whereas the #20 soils are characterized as lower-elevation, rocky, shallow soils, dominated by Douglas-fir.

Generally, the predominantly stoney to gravelly sandy loam soils formed from sandstone, shale colluvium, and alluvium. Soils within the Rock outcrop-Rubbleland-Travessilla complex and the Midfork family-Comodore complex are typically well drained with moderate permeability, rapid runoff, and are highly susceptible to water erosion. Soils within the Croydon loam have moderately slow permeability, and therefore, depending on slope, erosion characteristics vary from slight to severe. The main point is that because of steepness of slope and soil quality, all of these soils are highly erosive. Shallow soils dominate the east facing side slopes while generally deeper soils characterize the west facing toe slopes.

The Order-I survey was conducted for the Dugout Canyon Mine to describe soils found within the surface facilities area. A total of 12 soil test pits were excavated and are located on a soils map, Plate 2-2, Disturbed Area Soil Map. Soil test pits located in disturbed/overburden soils include TP-2, 3, and 11; pits located in Type TS soils include TP-1, 4, 5, 6, 7, 8, 9, 14, and 14A. Soils were delineated and described in accordance with the standards of the National Cooperative Soil Survey. Soil Test Pits TP-1, 2, 3, 4, 5, 6, 8, 9, and 11 were sampled and characterized according to the DOGM's Guidelines for Topsoil and Overburden¹; laboratory data and analytical summaries for each of these samples are provided in Table 2-1 of the PAP. Pits 7, 14 and 14A were not sampled, but pit descriptions were used to estimate soil volumes.

Chris Hansen of EarthFax Engineering, Inc., gathered the soil resource information. A Qualification statement for performing the Dugout Canyon soil survey and a personal Resume are provided in Appendix 2-3, Soil Test Pit Logs.

The Phase II submittal updates the Order-I survey by including sites TP7 (below the sediment pond in soil the Datino Variant complex¹, designated as TS); TP13 (located at the proposed water tank area, also Datino Variant, designated as TS); and TP16 (located on the slope above the coal storage area and designated 96 for Rock Outcrop - Rubbleland- Travesilla Complex). These soil test pit locations are located on soils map, Plate 2-2, Disturbed Area Soils Map. Laboratory data and analytical summaries for each of these samples are provided in Table 2-1 of the PAP.

Disturbed Soils

A large portion of the mine facility's area is covered by overburden and disturbed soils consisting of soil mixed with coal waste and/or waste rock from previous mining operations. These soils are described by soil test pits TP-2, TP-3, and TP-11. The overburden is a mixture of rock and/or coal waste with Travessilla

¹Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.

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soils. The Travessilla soils are classified by the SCS soil survey as loamy, mixed (calcareous) mesic, Lithic Ustic Torriorthents. The overburden is found in the flat areas and on most of the steep slopes; is moderately well drained, and supports sage brush, juniper, rabbit brush, and a variety of grasses. Soil thickness varies from a few feet to more than eight feet. Generally, the overburden soils are described as a "gravelly loam" with rock concentrations between 10 and 40 percent and rock size that varies from gravel to boulder. Rock fragments are composed of sandstone with some siltstone blocks.

Undisturbed Soils

The remainder of the facilities area has soils that appear to be undisturbed or have been only slightly disturbed. Soils present in the canyon bottom lie within the disturbed and undisturbed areas of the mine. The undisturbed soils were identified by the Order-I survey as part of the SCS listed soil unit Datino Variant complex, and were given the distinction "Soil Type TS." According to the SCS Carbon County soils survey, the Datino Variant soil complex is characterized as very deep, well drained, moderate permeable soils on mountain slopes being formed in colluvium derived dominantly from sandstone and shale. The SCS survey defines Datino Variant soils as loamy-skeletal, mixed Typic Haploborolls. The typic subgroup of Haploborolls² is defined as freely drained soils with a moderately thick brownish mollic epipedon. Typic Haploborolls were formed in alluvium during the late-Pleistocene or Holocene ages, do not have a shallow lithic (stone) contact, and do not have deep wide cracks in most years. The USDA handbook further states that where slopes are suitable, Haploborolls are mostly under cultivation.

Undisturbed TS soils, as represented by soil test pits TP-1, 4, 5, 6, 7, 8, 9, 14, and 14A, are found on both sides of Dugout Creek in the northeastern portion and in the southwestern portion of the facilities area. The TS soils are found in flat lying areas and on slopes with grades up to 40 percent or more. The soil supports vegetation consisting of sage, cottonwood, Gambel oak, grass, pinyon, and fir. Information condensed from soil test pit TP-4, TP-6 and lower sections of pit TP-1 show soil horizons O1 (1 inch), A1 (1 to 5 inches), B2 (5 to 14 inches), B3 (14 to 28 inches), and C (28 inches to 9 feet). Portions of TP-5 and TP-8 soil profiles appear to have been reworked by Dugout Creek; the upper four feet of TP-1 soil profile appear disturbed. Undisturbed Type TS soils have acceptable physical and chemical characteristic results consistent with requirements outlined by DOGM's soil and overburden guidelines as recorded in Table 2-1.

Other undisturbed soils located within the Disturbed Area Boundary and described by the SCS soils Order-III survey include Croydon loam, Comodore-Datino Variant complex, and Rock Outcrop-Rubbleland-Travessilla complex soils.

Soil Productivity

Current soil productivity for the undisturbed and/or slightly disturbed soils is reported by the 1996 survey for living cover percentages as recorded in Section 321.100.

Substitute Topsoil

The disturbed soils within the mine area have been significantly altered by previous mining activities and have lost their native identities. These disturbed soils, or overburden materials, typically contain waste rock and/or coal waste. With the exception of rock fragments and coal waste, these overburden materials have physical and chemical properties that are within DOGM's acceptable range for soil and overburden guidelines and could therefore be considered a substitute topsoil. The Division recognizes that native soils contain high

²Soil Conservation Service, U.S. Department of Agriculture, Agriculture Handbook No.436, pp 288-289.

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percentages of rock fragments, is inevitable and does not present a reclamation hazard. Indeed, to reclaim and restore the land to pre-mining conditions will require soils with indigenous rock fragment volumes and content. Therefore, it is not only acceptable, but desirable to salvage soils containing intrinsic rock. Waste and coal waste will be segregated from the soils and disposed of properly.

Findings:

The information provided meets the regulatory requirements of this section.

LAND-USE RESOURCE INFORMATION

Regulatory Reference: R645-301-411.

Analysis:

Land use resource information is given in Chapter 4 of the plan. Premining land uses for the permit area are wildlife habitat and rangeland for cattle and sheep grazing. The land has not been developed or improved for these uses. Recreational use of the permit area is limited due to lack of access through private property. Carbon County has zoned the permit area for mining and grazing (Section 4.11.120). Logging operations were conducted within the permit area in 1996 as shown on a map in Exhibit B, Appendix 4-3. Cascade Resources, logging contractor, reported harvesting six million board feet from the areas shown in Exhibit B. Most of these areas are within the Dugout Creek drainage.

Current productivity of the land surrounding the proposed disturbed area was estimated by George Cook, National Resources Conservation Service, on August 6, 1996 to be 1400 pounds per acre air dry herbage and in low good condition. On December 3, 1997, Mr. Cook reported the Dugout Canyon Mine to have 800 and 1500 pounds per acre air dry herbage in the pinyon/juniper/sage and riparian areas respectively. Mr. Cook indicated in a telephone conversation on March 5, 1998, that there was no snow on the ground at the December 3 visit. Previous productivity statements about Dugout Canyon showed the area to be severely overgrazed and degraded in the late 1970's and early 1980's. The proposed disturbed area is still grazed, but it is in a somewhat better condition.

A drive through of the permit area above the disturbed area where logging operations had been conducted revealed a degraded condition in the summer of 1997. Steep slopes along Dugout Creek had been logged, roads cut with material side cast, and limited visible revegetation had occurred at that point. Timber slash was in the stream, a culvert plugged, and several small slides had deposited sediment into Dugout Creek. Flatter riparian areas were overgrazed with streambanks sloughing and grass approximately an inch high. DWR stated that logged areas had little ground cover and there were numerous roads which concentrate water flows. Appendix 7-9, page 2, says the logged Douglas fir area was rated in fair condition. The description of the Douglas fir logged area did not accurately reflect on the ground conditions. Mike Suflita, Division Hydrologist, stated that the culvert sizing was conservative and adequate to account for the increased runoff and sedimentation from logging activities within the watershed.

Coal mining has occurred within Dugout Canyon since 1925. The Red Glow Mine on the east side of Dugout Canyon was hand-developed by D. J. Collins in 1925. The Rock Canyon seam on the west side of Dugout Canyon was first mined in 1952 by E.S.O. Coal Company. The Knight Ideal Coal Company mined the Rock Canyon and Gilson coal seams between 1958 and 1964. They extracted approximately 1,326,000 tons of coal in that period. No coal has been mined since 1964, although the portals have been opened and explored

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several times since then.

The Fish Creek and Pace Canyon Mines which operated in the early 1900's are also located within the permit area.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: R645-302-320.

Analysis:

The Phase 2 submittal presented several factors that preclude the mine site from being classified as alluvial valley floors. Based on information presented, the following findings can be made:

- No significant deposits of stream-laid alluvium exist within the permit area. The closest areas of alluvium occur outside the permit area, approximately 2,000 feet downstream area along Dugout Creek and 600 feet north in the headwaters of Pine Canyon.
- Stream-laid deposits within the proposed disturbed area do not "hold" Dugout Creek as required by the AVF definition. The Dugout Creek is generally held by underlying bedrock.
- No irrigated agriculture has or does occur within the permit and adjacent areas.
- No flood irrigation or subirrigation of stream-laid deposits have historically occurred within the proposed disturbed area.
- Soil and topographic conditions within the proposed disturbed area preclude future flood irrigation of the site.

Finally, the proposed disturbed area occurs mainly upland. Therefore, by definition, no Alluvial Valley Floor exists.

Findings:

The information provided meets the regulatory requirements of this section.

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PRIME FARMLAND

Regulatory Reference: R645-301-221, -302-270.

Analysis:

No prime farmland has been identified within the presently proposed Dugout Canyon Mine permit area. A negative prime farmland determination was concluded in 1980 for the Sage Point-Dugout Mine permit (ACT/007/009). Within the immediate mine facilities area, the Soil Conservation Service's (SCS) "Soil Survey of the Carbon County Area"³ identify Croydon Loam, Comodore-Datino Variant complex, Midfork family-Comodore complex, and the Rock outcrop-Rubbleland-Travessilla complex as non-irrigated soils. The Croydon Loam is rated good for livestock grazing and is well suited for timber harvesting of aspen. For Comodore-Datino Variant, Midfork family-Comodore complex, and Rock outcrop-Rubbleland-Travessilla complex, these soils are not considered grazeable by livestock and the soil-unit areas are limited for harvesting wood products because of slope steepness, surface stones and boulders, and abundant rock outcrops.

Findings:

The information provided meets the regulatory requirements of this section.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: R645-301-623, -301-724.

Analysis:

Geologic information includes a description of the geology of the proposed permit and adjacent areas down to and including the stratum immediately below the lowest coal seam to be mined and the aquifer below the lowest coal seam to be mined that may be adversely impacted by mining. This description includes the areal and structural geology of the permit and adjacent areas, and other parameters that influence the required reclamation. It also shows how areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. The description is based on maps and plans required as resource information for the plan, detailed site specific information, and, geologic literature and practices.

Descriptions of the stratigraphy and lithology of strata from the Mancos Shale up to the Colton Formation and of Quaternary pediment gravels and alluvium are in Section 624.100. That section also contains a discussion of geologic structure and a very brief description of the nature, depth, and thickness of the coal seams and the interburden between the Sunnyside, Rock Canyon, and Gilson seams. Plate 6-4 is an isopach map of the Rock Canyon seam overburden thickness and Plate 6-5 is an isopach map of the Rock Canyon to Gilson seam interburden thickness. Plates 6-6 and 6-7 in the Confidential binder are, respectively, isopach thickness maps of the Rock Canyon and Gilson seams.

The Gilson and Rock Canyon seams are both sufficiently developed to allow for economic mining in

³Jensen, E. H., and Borchert, J. W., 1988. Soil Survey of Carbon Area, Utah. Soil Conservation Service, U. S. Department of Agriculture, Washington D. C.

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the proposed permit area but only the Rock Canyon seam is to be mined under the proposed MRP. Minable coal in the Rock Canyon seam ranges from 5 to 8 feet in thickness (p. 6-15). Although the current permit application does not include federal acreage, an R2P2 for the logical mining unit that includes Soldier Canyon and Dugout Canyon Mines and federal lease U-07064-027821 is included in the Confidential binder.

Appendix 6-1 (Confidential binder) contains cutting and core logs for drill holes 3-1, 9-1, 9-2, 10-1, 11-1, 13-1, 13-2, 14-1, 15-1, 15-2, 15-3, 19-2, HCC-4 (H-4), KCC-A and KCC-E. Collar or ground elevations are included in Appendix 6-1. Drill hole locations and elevations are shown on Plate 6-1.

Some bore holes have been logged from the surface to total depth, for others only the coal seams and adjacent strata have been logged. Together, the logs describe lithologic characteristics and thickness of each stratum from the surface to below the coal seams. Ground water occurrence was not marked on these logs at the time the holes were bored (p. 6-17). Bore hole logs were used to construct the cross sections on Plate 6-3, which show the interval from the Sunnyside coal zone to below the Gilson coal zone. Figure 6-1 is a more general cross section from the surface to the Mancos Shale. Plate 6-3 and Figure 6-1 are listed in the Table of Contents of the Phase II submittal and are assumed to be the same as those in the current MRP, but the applicant needs to assure that copies of these two cross-sections are in the final Phase II MRP.

Analysis reports on coal, floor, and roof samples from the Rock Canyon and Gilson seams are found in Appendix 6-2 (Confidential binder). Floor and roof samples of the Rock Canyon seam were collected from one of the portals of the abandoned Rock Canyon seam mine in Dugout Canyon (portals shown on Plate 5-1) and a sample of coal was taken from a fresh coal outcrop located a few-hundred feet inside. The location where the coal, roof, and floor samples were collected for the Gilson seam is shown on Figure A1 in Appendix 6-2 in the Confidential binder.

Samples were analyzed for acid- or toxic-forming and alkalinity-producing materials, including total sulfur but not pyritic or other specific forms of sulfur. BTU, ash, and sulfur content of the Rock Canyon coal are briefly summarized at the end of Section 624.100. No unacceptable values were reported for the parameters listed in Table 2 of UDOGM's "Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining".

Data from one location are probably insufficient to determine the potential for acid- and toxic-forming materials for the entire proposed mine. However, waste material from the mine is not to be used in reclamation. (Although not part of this permit submittal, future development of a waste-rock disposal site has been contemplated.) Limited topsoil will be available for reclamation, so selected overburden materials from the facilities area and B and C horizon soils from the sediment pond area will be used as substitute topsoil and growth media during reclamation. Current information indicates these materials are within acceptable acid- and toxic-forming parameters (Table 2-1). Data from the adjacent Soldier Creek Mine and other operations in the Book Cliffs support the determination of low potential for acid- and toxic-forming or alkalinity-producing material. The MRP contains a commitment (p. 2-33) that where overburden materials are used to supplement topsoil, they will be used only after it has been demonstrated that the resultant soil is suitable for supporting revegetation.

Clay content was determined for the roof and floor rock samples. The sample from the roof of the Gilson seam contained twenty percent clay, but clay content of the other roof and two floor samples was less than ten percent. Drill-hole logs indicate lithology of strata immediately above and below the minable coal varies within the permit and adjacent areas. Several factors, such as thickness of overburden, use of a 35° angle of draw in formulating the subsidence control plan, anticipation that most of the land within the permit area will eventually be affected by subsidence, and the low potential for material damage from subsidence indicate additional determination of engineering properties of roof and floor rock would be of little value. No

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additional determinations of thickness and engineering properties of clays or soft rock are needed prior to approval of the proposed MRP.

Rock Canyon coal thickness in the proposed permit area ranges from 5 to 8 feet, except for a want in the north-central part of the proposed permit area, where coal thins to under three feet (Plate 6-6). Maximum subsidence can be projected as 3.5 to 5.6 feet, based on the assumption that the surface will subside up to 70% of the thickness of the extracted coal. Overburden thickness ranges from 600 feet in the south part of the proposed permit area to over 2400 in the north. Overburden consists of the upper Blackhawk Formation, the Castle Gate Sandstone, and the Price River, North Horn, and Flagstaff Formations, which are described in Section 624.100. Gilson to Rock Canyon interburden thickness is 30 to 80 feet over most of the proposed permit area, and up to 100 feet at the west edge (Plate 6-5), and Rock Canyon to Sunnyside thickness is 140 to 180 feet.

The application includes geologic information in sufficient detail to assist in determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface and ground water monitoring is necessary; and determining whether reclamation as required by the R645 Rules can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

At this time the Division does not require the collection, analysis, and description of additional geologic information to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards.

The applicant has made no request the Division to waive in whole or in part the requirements of the bore hole information or analysis required of this section. However, the applicant has requested, within the text of the PAP, that the information in Appendices 6-1 and 6-2 be kept confidential. The applicant should provide this information in a folder or binder separate from the rest of the PAP and marked "Confidential".

Findings:

Information in the geologic resource section is not considered adequate to meet the requirements of this section. Prior to approval Canyon Fuel Company must provide the following information:

R645-301-622 - Plate 6-3 and Figure 6-1 are listed in the Table of Contents of the proposed Phase II MRP and referred to in the text, but they are not in the proposed MRP. These two cross-sections are assumed to be the same as those in the current MRP, but the applicant needs to assure that copies are in the Phase II MRP.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: R645-100-200, -301-724.

Analysis:

Sampling and analysis.

Where possible, all water samples collected for use in the MRP were analyzed according to methods in either "Standard Methods for the Examination of Water and Wastewater" or 40 CFR parts 136 and 434. Where feasible these same references were used as the basis for sample collection (p 7-4).

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Appendices 7-2 and 7-7 contain tabulated summaries of the water-quality data but the original laboratory reports are not in the MRP. Much of the water-quality data in the appendices was not obtained directly by the applicant and the applicant had no control over either collection or analysis methods.

Baseline information.

Ground-water information.

No additional ground-water quality and quantity data have been included with the proposed amendment. Water monitoring that potentially met the minimum requirements of SMCRA and the Utah Coal Mining Rules was done at only 13 (6 springs and 7 in-mine locations) of the 97 sites listed in the initial PAP. On average only three samples were analyzed for those thirteen sites, so determination of baseline seasonal quality was minimal. Ground-water monitoring data, both baseline and operational, collected since 1996 need to be added to the MRP.

Surface-water information.

No additional surface-water quality and quantity data have been included with the proposed amendment. Water monitoring that potentially met the minimum requirements of SMCRA and the Utah Coal Mining Rules was minimal in the initial PAP. Surface-water monitoring data, both baseline and operational, collected since 1996 need to be added to the MRP.

Baseline cumulative impact area information.

The permitted area will remain within the boundaries of the existing CIA, and there will be no mining operations in hydrologic basins other than those approved in the current permit. So there is no need for additional cumulative impact area information.

Modeling

No numerical groundwater or surface water modeling was conducted in support of the proposed Phase II MRP, although some that has been published by others, such as Lines, is referenced.

Alternative water resource information

The statement is made on page 7-40 that "No surface mining will be conducted in the permit and adjacent areas. Therefore, this section does not apply to the Dugout Canyon Mine." Because of the way R645-301-727 and the definition of "Surface Coal Mining and Reclamation Activities" are written in the Utah Coal Mining Rules, the applicant's response is adequate. Regardless, the determination of the Probable Hydrologic Consequences (PHC) has indicated that the proposed coal mining activities will not result in the contamination, diminution, or interruption of ground-water or surface-water sources within the proposed or adjacent areas, so there is no need for information regarding alternative water sources.

Probable hydrologic consequences determination.

A PHC determination prepared by Mayo and Associates in 1996 is in Appendix 7-2. Previous studies in the vicinity of the Soldier Canyon Mine were reviewed for information on geology, hydrology, and hydrogeology and for data on discharge, sediment, and other surface and ground water parameters. Seventeen additional ground and surface water samples were collected in 1995 for chemical and isotopic analyses. In spite of a large data base, most of the analyses lack information on the basic parameters required by the Coal

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Mining Rules and SMCRA, and on seasonal variation.

The PHC determination for the MRP begins on page 7-41. It is based on data collected in 1996 and earlier and it has not been updated for the proposed amendment. Additional baseline samples were collected and analyzed during 1997 and early 1998 to help provide more complete baseline data, and collection of operational data began in 1998; these data are not included in the proposed Phase II amendment to the MRP and have not been evaluated for the PHC determination.

Adverse impacts to the hydrologic balance

Potential adverse effects to the hydrologic balance from the proposed mining operations identified in Appendix 7-3 (p. 60) are: decreased stream flows and spring discharges due to capture of surface or ground water by subsidence, bedrock fracturing, and aquifer dewatering; increased stream flows due to increased discharge of ground water from the Blackhawk Formation through the mine workings; and increased ground water recharge to overlying ground water systems.

The PHC of the MRP (p. 7-45) states that potential impacts to the availability of surface and groundwater from the Dugout Canyon Mine operations include both decreased and increased stream flows and spring discharges caused by mine-related subsidence, bedrock fracturing, and aquifer dewatering.

Chemical and isotopic analyses of ground water, data from hydrographs, and the behavior of ground water systems in and adjacent to the Soldier Canyon Mine indicate that the mine has not adversely impacted ground water quantity or quality. Subsidence and surface fracturing have not occurred above the Soldier Canyon Mine. Mining locally dewateres strata immediately adjacent to the Blackhawk Formation but does not appear to draw additional recharge from other overlying or underlying ground water systems. Similar geologic, hydrogeologic, and hydrologic conditions exist at the proposed Dugout Creek Mine and the proposed operations should not adversely impact water quantity or quality in ground water systems overlying and underlying the coal to be mined.

Acid-forming or toxic-forming materials

Information in Chapter 6 indicates there are no acid- and toxic-forming materials at the Dugout Canyon Mine. There is no significant potential for contamination of surface and ground waters in the permit and adjacent areas from such materials (p. 7-41).

Important water quality parameters

Data suggest the TDS concentration of water in Dugout Creek may roughly double during lowest flow if water is discharged from the mine to the creek (p. 7-42). Dominant ions (sodium and bicarbonate) in the Blackhawk Formation water closely match those in Dugout Creek during periods of low streamflow (sodium, manganese, bicarbonate, and sulfate). During periods of high streamflow the dominant cation in Dugout Creek is calcium. Use of powdered limestone or dolomite (calcium-magnesium carbonate) rather than gypsum (calcium sulfate) as rock dust in the mine should reduce the possible chemical influence of mine-discharge water on Dugout Creek.

Based on experience at the Soldier Canyon Mine, there is minimal potential for tension cracks to locally divert water deeper into formations, which could result in increased leaching and increased TDS concentrations (pp. 7-43 and 7-44).

Dugout Creek is classified as class 2B (secondary contact recreation use), 3C (nongame fish and other

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aquatic life use), and 4 (agricultural use). If discharges occur from the Dugout Canyon Mine to Dugout Creek, TDS concentration of these discharges will not exceed applicable water-quality standards. Iron and manganese concentrations in waters from the Blackhawk Formation and Dugout Creek indicate that the concentration of iron and manganese in the creek should not be significantly affected by discharges from the mine (p. 7-43).

Ground water and surface-water availability

Potential adverse effects to the hydrologic balance from the proposed mining operations are: both decreased and increased stream flows and spring discharges due to capture of surface or ground water by mine-related subsidence, bedrock fracturing, and aquifer dewatering; increased stream flows due to increased discharge of ground water from the Blackhawk Formation through the mine workings; and increased ground water recharge to overlying ground water systems. It appears that the Soldier Canyon Mine has not decreased groundwater discharge in overlying or underlying groundwater systems. It is unlikely that coal mining will effect the discharges of any spring as a result of mining in the Dugout Canyon permit and adjacent areas (Appendix 7-3 and MRP - pp. 7-45, -46).

Considerable seasonal and climatic variability are noted in the hydrographs of springs in the permit and adjacent areas, but data for both Soldier Creek and springs that overly the Soldier Canyon Mine workings do not show discharge declines which may be attributed to either subsidence or bedrock fracturing. The Blackhawk groundwater system in the vicinity of mined coal seams is compartmentalized both vertically and horizontally. Coal mining locally dewateres overlying rock layers in the Blackhawk Formation but does not appear to draw additional recharge from overlying or underlying groundwater systems (p. 7-46).

Steady-state inflow to the Dugout Canyon mine is expected to be approximately 220 gpm (p. 7-49). Mine consumption is estimated to be 30 gpm, leaving 190 gpm (306 acre-feet/yr) discharge to Dugout Creek, which would represent an increase of approximately 6% over average annual flow of 5,100 acre-feet/year (p. 7-50). Estimated maximum discharge from the Dugout Canyon Mine will be approximately 400 gpm. If this maximum rate were sustained for a full year it would be a 13% increase in the estimated average annual flow of Dugout Creek (p. 7-50).

The potential for mine water discharge and increased flow rates in Dugout Creek are based on the studies of Lines (1985 - see MRP for reference). Actual data that could be used to correlate coal production rates to mine water discharge rates at the Soldier Canyon Mine and to predict mine water discharge rates for the Dugout Canyon Mine are not in the PAP. Annual reports provide some information.

Flooding or streamflow alteration

Runoff from all disturbed areas will flow through a sedimentation pond or other sediment-control device prior to discharge to Dugout Creek, which will minimize or preclude flooding impacts to downstream areas.

The volume of streamflow will increase in Dugout Creek if water is discharged from the mine to the creek: care will be taken during discharge of this water to avoid flooding of downstream areas. Potential impacts to the creek channel include displacement of fines on the channel bottom and minor widening of the channel. It is anticipated that the streambank vegetative community will increase in density and vigor as a result of mine-water discharges, and this vegetation will in turn minimize widening of the channel.

Once mining ceases the mine will be sealed, discharges will cease, and Dugout Creek will return to pre-mining discharge levels. Following reclamation, stream channels altered by mining operations will be returned to a stable state. Reclamation channels have been designed to safely pass the peak flow resulting from

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the 10-year, 6-hour or the 100-year, 6-hour precipitation event, so flooding in the reclaimed areas will be minimized. Interim sediment-control measures and maintenance of the reclaimed areas during the post-mining period will preclude deposition of significant amounts of sediment in downstream channels, maintain the hydraulic capacity of the channels, and control adverse off-site flooding.

Subsidence tension cracks that appear on the surface will increase the secondary porosity of the formations overlying the Dugout Canyon Mine. During the period prior to healing of these cracks this increased percolation may decrease runoff during the high-flow season, and during low-flow periods the increased percolation from the high-flow season may return to the stream. as base flow The net result will be a decrease in the flooding potential of the stream (pp. 7-44 and -45).

Sediment yield from the disturbed area

The potential impact of mining and reclamation on sediment yield is an increase in sediment in surface waters downstream from disturbed areas. Sediment-control measures such as sedimentation ponds and diversions will be installed to minimize this impact while the mine is being actively operated, and silt fences and straw-bale dikes will be installed to control erosion as vegetation becomes established during reclamation. These measures will reduce the amount of erosion and control adverse impacts to the environment.

Subsidence cracks that intersect steep-gradient stream channels could increase the sediment yield of the stream; however, sediment would also tend to fill such cracks and return the stream to pre-subsidence conditions, so the potential impact to sediment yield from subsidence in the permit area would be minor and of short duration (p. 7-42).

Potential Hydrocarbon Contamination

Diesel fuel, oils, greases, and other hydrocarbon products will be stored and used at the site for a variety of purposes. Diesel and oil stored in above-ground tanks at the mine surface facilities may spill onto the ground during filling of the storage tank, leakage of the storage tank, or filling of vehicle tanks. Similarly, greases and other oils may be spilled during use in surface and underground operations. The probable future extent of the contamination caused by diesel and oil spillage is expected to be small because the tanks will be located above ground and spillage during filling of the storage or vehicle tanks will be minimized to avoid loss of an economically valuable product. A Spill Prevention Control and Countermeasure Plan (SPCC) is to be developed for the site will provide inspection, training, and operation measures to minimize the extent of contamination resulting from the use of hydrocarbons at the site. A copy of this plan is to be maintained at the mine site (p. 7-50).

There is no SPCC in the MRP nor any indication a SPCC has been prepared.

Road Salting

No salting of roads will occur within the permit area so this potential impact is not a concern (p. 7-50).

Coal Haulage

Coal will be hauled over the county road from the Soldier Canyon Mine to the Soldier Creek Road and from there to its ultimate destination. In the event of a spill from the trucks coal may wash into local streams. Possible impacts to the surface water are increased total suspended solids concentrations and turbidity from the fine coal particulates. The probability of a spill occurring in an area sufficiently close to a stream channel to introduce coal to the stream bed is considered small.

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Wind may carry coal dust or small pieces of coal from the open top of the coal trucks into creeks near the roads. The impact from fugitive coal dust is considered to be insignificant due to the small amounts lost during haulage in the permit and adjacent areas (p. 7-50).

Findings:

Hydrologic resource information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval Canyon Fuel Company must provide the following information:

R645-301-724, -728.100, -728.400, Baseline water-monitoring data obtained since the original PAP was prepared: these data need to be included in the proposed amendment to the MRP and evaluated as part of the PHC determination.

R645-301-732.121, -732.312, There is no SPCC in the MRP nor any indication a SPCC has been prepared for the Dugout Canyon Mine, but a commitment to prepare a SPCC is on page 7-50.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

The applicant has met the requirements of R645-301-521.141 by giving the Division with Plate 5-7 that clearly shows the boundaries of all areas proposed to be affected over the estimated total life of the coal mining and reclamation operations.

In Section 523 of the PAP the applicant states that they schedule mining to begin in 1998. The dates on Plate 5-7 show that the applicant hopes to mine from 1998 till 2020.

Not all the proposed mining areas are in the permit area. Before permitting the life-of-mine affected area the applicant wants to learn more about the mining conditions in the permit area. If mining conditions are favorable, the applicant will apply for expanding the permit boundary.

The Division understands the applicant cannot determine that mining condition until production begins. The applicant does not want to permit areas that may never be mined. Therefore, the Division agrees to process permit boundary expansion in the future.

Archaeological and Cultural Resource Maps

The required maps are contained in the cultural resources evaluation report in Appendix 4-1. This information needs to be placed in the confidential file.

Coal Resource and Geologic Information Maps

Surface geology for the permit and adjacent areas is shown on Plate 6-1, a certified map. Elevations (to the nearest 40 feet) and locations of test borings are also shown on Plate 6-1. Coal crop lines are shown on

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Plates 6-1 and 6-2. Strike and dip of strata at the surface are shown on Plate 6-1 for several locations within and adjacent to the southwest corner of the proposed permit area: dip is also indicated by cross-section A-A' (Figure 6-1). Strike and dip are apparently uniform over a larger area, but explicit information for the larger area would be useful.

Limited information on nature, depth, and thickness of the Rock Canyon seam, which is the coal seam to be mined, is on bore hole logs in Appendix 6-1 (Confidential binder) and on cross-sections B-B' and C-C' (Plate 6-3). Similar information on the overlying Sunnyside seam and the underlying Gilson seam is on cross-sections B-B' and C-C' (Plate 6-3), and also on bore hole logs in Appendix 6-1. Overburden is shown on bore hole logs in Appendix 6-1. Plate 6-4 is an isopach map of the Rock Canyon seam overburden thickness and Plate 6-5 is an isopach map of the Rock Canyon to Gilson seam interburden thickness. Isopach thickness maps of the Rock Canyon and Gilson seams are on Plates 6-6 and 6-7 in the Confidential binder. There is no isopach thickness map of the Sunnyside seam, the principal rider seam.

Existing Structures and Facilities Maps

The applicant met the requirements of R645-301-521.122 by documenting the location of the existing structures on Plate 4-1. The existing structures include a power line that will be upgraded and existing dirt roads in the permit area.

Existing Surface Configuration Maps

In Section 521, Land Surface Configuration the applicant states:

A map showing topographic conditions prior to disturbance by SCM is provided as Plate 5-4. This map also shows the area of pre-SMCRA disturbance, as mapped in 1980, together with nonmining areas of disturbance which occurred after 1980 but prior to 1996.

R645-301-521.150 requires an applicant to submit maps that clearly show the existing topography of the disturbed area. Existing topography means the surface configuration as it existed prior issuance of a coal mining permit. Plate 5-4 meets the requirements of R645-301-521.150 because the plate shows the topography of the disturbed area prior to the permit being issued.

R645-301-521.151 requires that the existing land surface maps have the contours extending 100 feet beyond the disturbed area boundary. There are some areas on Plate 5-4, Existing Surface Topography, that do not have the contours extending 100 feet beyond the disturbed area boundary. The applicant must extend the contours 100 feet beyond the permit boundary on Plate 5-4.

Mine Workings Maps

Plate 5-1 shows the location of the mine workings that existed before the Division issued the permit. Plate 5-1 shows the Pre-SMCRA mine workings in the Rock Canyon and Gilson seams and the old mine openings.

The applicant did not give the Division a detailed map of the proposed mine workings. The Division needs a detailed mine map similar to those required to MSHA. In Phase I the applicant committed to supply the Division with a detailed mine map but has not yet fulfilled that commitment. The applicant has not yet met the requirements of R645-301-521.141.

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Monitoring Sampling Location Maps

Locations and approximate elevations of bore holes are shown on Plate 6-1. Collar elevations, some estimated from topographic maps, and elevations of cored sections are given in Appendix 6-1 (Confidential binder).

Elevations and locations of monitoring stations used to gather data on water quality and quantity in preparation of the application are on Plate 7-1.

There are no permanent wildlife monitoring sites. Habitat enhancement, the riparian area along Dugout Creek, is shown on reclamation maps.

No map of air quality monitoring sites has been required by UDOGM.

Permit Area Boundary Maps

The disturbed area boundaries in Phase II have been changed. The changes are shown on a map given to the Division by the applicant but not included in the MRP. Some disturbed areas are included in Phase I but not in Phase II. By removing areas from disturbed boundaries can only be done by bond release. Since the applicant has not applied for bond release the Division cannot release any areas from the disturbed area. Therefore, the applicant cannot remove areas from the disturbed area boundaries without going through bond release.

The applicant told the Division that the exclusion of some disturbed area boundaries in the Phase II maps was an oversight. The applicant committed to including all disturbed areas in Phase I in the Phase II disturbed area boundaries.

The applicant shows that the proposed BLM lease is in the permit boundary. The Division cannot approve the proposed lease into the permit area until the lease is granted. Therefore the Division cannot approve Phase II until the lease is approved. The Division is aware that the applicant is expecting the lease to be approved shortly.

The applicant did not meet the requirements of R645-301-521.163.

Surface and Subsurface Ownership Maps

Plate 1-1 and Plate 1-2 met the requirements of R645-301-521.131 and R645-301-521.132.

Plate 1-1 and Plate show the surface and coal ownership. The applicant gives the legal descriptions of the fee land and coal leases in Chapter 1 of the PAP.

Subsurface Water Resource Maps

A potentiometric surface map for the Castle Gate Sandstone, covering the eastern portion of the proposed permit and adjacent areas, is shown on Plate 7-3. There are no maps, plans, or cross-sections showing potentiometric surfaces for shallower or deeper strata. Subsurface water within the proposed permit and adjacent areas occurs mainly in perched aquifers in the Blackhawk Formation, the underlying Starpoint Sandstone, and in overlying strata, so an exact areal and vertical distribution of ground water is not known. There is no map of a potentiometric surface for a regional aquifer. Data in the MRP indicate an irregular potentiometric surface in the Blackhawk Formation, near the Soldier Canyon Mine, that is influenced by the

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outcrop of the Blackhawk Formation in nearby Soldier Canyon, the mine workings, and the non-uniformity of screen length and placement within the strata, and the lateral discontinuity of the strata (p. 7-28). There is no portrayal of seasonal differences of head in different aquifers on cross sections or contour maps, but hydrographs for several springs and graphs of water levels in four monitoring wells are provided.

The relationship of geology to ground water is discussed extensively in the text, yet there is no map that relates geology to ground water occurrence, in particular the location of springs in relation to surface exposures of stratigraphic units.

Spring 10 in the Soldier Canyon Mine permit area issues from the North Horn Formation but the water may originate in a deeper formation and reach the surface through a fracture. The chemistry and long-term hydrographs of Spring SP-10 are more consistent with a deep source, rather than a shallow source such as seen in springs issuing from the Flagstaff, North Horn, and Price River Formations. Isotopic and solute compositions are similar to those in ground water from the Blackhawk Formation. There is no fracture mapped but the major water-bearing fracture in the Soldier Canyon Mine coincides approximately with the surface location of this spring.

Surface Water Resource Maps

There are no water-supply intakes for current users of surface waters flowing into, out of, and within the proposed permit and adjacent area. Surface waters that will receive discharges from affected areas in the proposed permit area are shown on Plate 7-1. Location of surface water bodies such as streams, lakes, ponds, springs, constructed or natural drains, and irrigation ditches within the proposed permit and adjacent areas are shown on Plate 7-1.

Vegetation Reference Area Maps

A potential range site reference area for comparison to riparian areas is shown on Plate 3-1D, but the Division needs to receive further information about this site before it can be approved. Other range sites have yet to be designated, so they are not shown on maps.

Well Maps

There are no gas and oil wells within the proposed permit and adjacent areas. There are no water wells in the proposed permit and adjacent areas.

Contour Maps

Plate 5-4 shows the existing topography, Plate 5-2 shows the proposed topography during mining and Plate 5-5 shows the topography after reclamation. The Division reviewed these plates and determined that they adequately showed the surface configurations.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-300-124.130, Information in Appendix 4-1 needs to be kept confidential.

R645-301-323.100, The range site reference areas need to be shown on maps.

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R645-301-521.151, The applicant did not show the contours lines extending at least 100 feet from the disturbed area boundaries on Plate 5-4.

R645-301-521.141, The applicant did not give the Division a detailed map of the proposed mine workings. The Division needs a detailed mine map similar to those required to MSHA.

R645-301-521.163, The applicant did not show the correct disturbed area boundaries on the maps. Some of the areas in Phase I were not included in Phase II. All disturbed areas in Phase I must be included in Phase II. The applicant shows areas in the proposed BLM lease in the permit area. The Division cannot approve Phase II until the lease is granted. The Division is aware that the applicant is anticipating the BLM to grant the lease.

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PERMIT APPLICATION REQUIREMENTS

RIGHT OF ENTRY

Regulatory Reference: R645-301-114

Analysis:

The applicant has filed an application with the Bureau of Land Management to lease the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 23, Township 13 South, Range 12 East. The application is under review, but before the Division revises the permit to include this area, the applicant will need to have acquired the right of entry for this area.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

R645-301-113, The applicant needs to supply complete right of entry information for the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 23, Township 13 South, Range 12 East.

PERMIT FORMAT & CONTENTS

Regulatory Reference R645-301-100

Analysis:

There are several typographic errors in the plan that need correcting. These include:

Plate 7-5 has a note at the bottom right that appears to be left over from the original application and does not apply to the new configuration of the disturbed area.

Page 7-65 describes DD-8 discharging into the drop inlet connecting DC-1 and DC-2. Plate 7-5 shows DD-10 draining into the drop inlet.

Plate 7-4, Section B-B' the primary spillway and emergency spillways as having the same elevation, 6964.5. In addition, the Primary Spillway Riser Detail shows the top of the spillway riser at elevation 6964.0. These inconsistencies need to be resolved.

Plates 7-4, 7-5, 7-8, and possibly others, show the primary road at the lower end of the disturbed area ending near the sediment pond emergency spillway and dotted lines continuing where the road will be built. All affected drawings need to show the full road surface continuing for the full coverage of the respective drawing.

Finding:

Information provided in the application is not considered adequate to meet the requirements of this

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section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-121.200, The applicant needs to correct typographic errors on Plate 7-5, page 7-65, Plate 7-4, and all plates with an incomplete road.

MINING OPERATIONS AND FACILITIES

Regulatory Reference: R645-301-231, -301-526, -301-528.

Analysis:

General

In Phase II the applicant describes the Dugout Mine as an underground mine. The coal will be extracted by room-and-pillar methods. Estimated production will be 2,000,000 tons per year.

Type and Method of Mining Operations

In Section 523 the applicant states:

Room-and-pillar mining methods will be used in the Dugout Canyon Mine. The use of this mining method has been selected to maximize coal recovery and enhance production rates within the specific geologic constraints of the permit area. Longwall mining methods are not planned because these methods do not allow the selective horizon control that is necessary to reduce dilution of the coal with rock from the in-seam partings.

Continuous miners will be used, with either electric or diesel shuttle cars to haul coal to a feeder breaker at the section conveyor belt terminal end. Alternatively, electric continuous haulage system(s) between the miner and the section conveyor belt may be used. The continuous haulage system is comprised of a coal collecting hopper car located at the miner discharge boom, several track-mounted articulating mobile bridge conveyors, intermediate suspended bridge sections, and a rigid frame module conveyor assembly to discharge onto the section conveyor belt. The continuous haulage configuration is designed for higher production rates as compared with shuttle car haulage and will be used mostly in first and second mining panels. Roof bolters, scoops, power centers, and other auxiliary support equipment will be used in all mining sections.

Mining will consist of driving five to seven main and submain entry systems. Production panels, driven from these access entry systems, will consist of rooms and pillars. Pillar extraction in the panels (second mining) is planned up to overburden depths of approximately 1,750 feet. It is anticipated that full roof bolting plans will be mandatory from MSHA and that bolting of the ribs throughout the mine will not be required.

Equipment heights and economics will limit seam mining heights to a minimum of 6 feet. Roof bolters planned for use at the Dugout Canyon Mine (Fletcher Model HDDRs) are 73 inches high. The Long Airdox continuous haulage system operator cabs are 77 inches high. The rock duster-equipped Joy continuous miner is 72 inches high. It is presumed at this time that these equipment pieces may be modified to less than 72-inch operating and transport heights without impairing performance, safety, or upper limit operating heights to allow 72-inch mining heights. If such modifications are disallowed by

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MSHA or not made possible by the equipment manufacturers, or impede productivity, recovery of reserves in this height range may not be possible.

Anticipated Production. Anticipated annual production of coal from the Dugout Canyon Mine during the permit term is as follows:

1998 - 0.1 million tons
1999 - 1.0 million tons
2000 - 1.5 million tons
2001 - 2.0 million tons
2001 - 2.0 million tons

Through the remaining life of the mine, coal production from the mine is anticipated to be 2.0 million tons per year.

The information in Section 525 is consistent with other information in the MRP and represents a feasible mine plan. However, the applicant told the Division and other agencies that longwall mining will be used and the annual production will be 4,000,000 tons.

The applicant wants Phase II of the MRP processed quickly so they can begin construction of the surface. During the construction the applicant anticipates amending the MRP so that longwall mining can be permitted. The Division cannot guarantee the time needed to process the longwall amendment(s). Nor can the Division guarantee that the permits will be approved. The applicant assumes all responsibilities involved with amending the MRP to allow longwall mining.

Facilities and Structures

The applicant lists facilities and structures that existed at the mine site just before the permit issuance. The applicant also lists the facilities and structures that they plan to construct in Section 526 and 528 of the MRP. The Division has enough information to evaluate those structures. The Division's analysis of each structure is given in the section of the TA that deals specifically with that structure.

Findings:

The applicant met the minimum requirements of this section.

EXISTING STRUCTURES:

Regulatory Reference: R645-301-526.

Analysis:

Existing structures means, a structure of facility used in connection with or to facilitate coal mining and reclamation operations for which construction began before January 21, 1981. Under R645-301-526.110 the applicant is required to describe the existing structures to be used to facilitate the coal mining and reclamation operation. In Section 526.100 of the MRP the applicant states:

No buildings exist at the mine surface; therefore, no existing buildings will be used in

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connection with or to facilitate this proposed coal mining and reclamation operation

The wording and location of the above statement is confusing. The reader could assume after reading that statement that no buildings exist at the site. Later the reader would learn that buildings are at the mine site.

At the end of Section 526.100 the applicant describes an existing UP&L distribution line that existed before January 21, 1981. In other section of the MRP the applicant describes the roads that exist in the disturbed area. Even if the reader correctly assumes that the statement about not buildings existing at the mine meant that no buildings existed at the mine before the permit being issued he would later learn that some existing structures are in the permit boundary. The applicant needs to clarify the description of the existing structures so that the reader would understand that what existing structures exist in the permit area.

Findings:

R645-301-121.200, The applicant did not meet the regulatory requirements of this section. The applicant must clarify the statement about how no buildings exist at the site. See R645-301-121.200. To avoid confusion the Division recommends that the applicant place the information about the existing structures in a new subheading. The new subheading could be entitled Section 526.100 Existing Structures. By placing the information in a separate subheading the reader would understand what structures existed before January 21, 1981.

R645-301-526.100, The applicant must list the existing structures that will be used at the mine site. Existing structures include but are not limited to the existing power line and how it will be upgraded and the roads that will be used to access monitoring and data collection sites.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: R645-301-411.

Analysis:

Appendix 4-1 contains cultural resource information. There are two cultural resource sites in the vicinity of the disturbed area, but only one of these, some pictographs, is considered eligible for listing in the National Register of Historic Places. The other is the historic Dugout Canyon Mine, and it will be obliterated by the new mine. The pictographs are about 700 feet outside the area that would be disturbed, so they should not be affected by mine construction itself. However, the contractor doing road construction needs to be careful to not disturb the site. The consultant doing the cultural resources survey said there should be no blasting within 600 feet of the site, and the existing road is within about 220 feet of the site.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations. The contractor building the road to the mine needs to be careful to not disturb the pictographs in site 42 CB 92.

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RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: R645-301-521, -301-526.

Analysis:

In Section 526.116 of the PAP the applicant states:

They will conduct no coal mining operation within 100 feet of a right-of-way line of any public road, except where mine access or haul roads join the right-of-way.

In Section 521.100 of the PAP the applicant states:

An existing county road enters the permit area in NE $\frac{1}{4}$, SE $\frac{1}{4}$ Sec.22, T. 13 S., R. 12 E, extending within that section for approximately 500 feet within the permit area. The road then exits the permit area for approximately 1,300 feet length, then reenters the permit area in the SW $\frac{1}{4}$, NW $\frac{1}{4}$ Section 23 where it ends at the southern edge of the proposed disturbed area boundary.

In Section 527 of the PAP the applicant states:

The road which will access the mine is a county road that extends from the Soldier Creek Road (Utah Highway 53) to the mine (a distance of approximately 7.5 miles). Carbon County is currently planning the upgrade of this road to handle the increased traffic which is anticipated as a result of mine operation. The County will construct the upgrade and charge SCM a toll for use of the road.

Plate 5-2 show the county road will cherry stem 220 feet into the permit area. Therefore, the applicant's statements about how no mining activities will occur within 100 feet of a public road except where the road enters the permit area are incorrect. Those statements were correct in Phase I but no in Phase II. Therefore, the applicant must update transportation sections of the MRP that involve use of public roads. The applicant must include a plan for how the public will be protected from mining activities that will occur within 100 feet of the county road.

Findings:

R645-301-526.116, The applicant must update the MRP with a description of the county road within the disturbed area and what steps will be taken to protect the public.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: R645-301-420

Analysis:

Section 420 of Chapter 4 discusses compliance with the Clean Air Act. A copy of the Air Quality Approval Order is in Appendix 4-2. A Notice of Intention will be submitted to the Division of Air Quality requesting approval for a production rate of two million tons per year. This will need to be approved before

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the mine produces this much coal.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations.

COAL RECOVERY

Regulatory Reference: R645-301-522.

Analysis:

In Section 522 of the PAP the applicant states:

Mining operations at the Dugout Canyon Mine during the first 5-year mining term will occur in the Rock Canyon Seam. Future mining operations may also occur in the Gilson Seam. If the decision is made to mine in the Gilson Seam, information pertaining to the mining of this seam will be included in the MRP prior to the performance of such mining. The overall objective of mining operations in the permit area will be maximum coal recovery coupled with safety. Coal recovery at the mine has been and will continue to be maximized through the following efforts:

- Based on pre-mining analysis of drill-hole data and information obtained from past mining operations in the area, estimates of the nature, depth, and thickness of the coal seam and associated partings have been made. Using these data, the mine plan and mining methods will be periodically evaluated and amended as necessary to maximize coal recovery; and
- Experience gained during mining will be used to amend future mine plans if coal recovery can be increased.

The mine layout has been planned relative to panels, barriers, and pillars to optimize both coal recovery and safety.

Additional information regarding the coal recovery plan is provided in the Confidential Information folder associated with this MRP. Generally, the minimum mining height will be 6 feet. Based on the anticipated room and pillar mining method, the overall recoverable ratio of the in-place coal reserve is anticipated to be 55 percent.

The Division has reviewed the coal recovery plan in the confidential folder. The guidelines for coal recovery are similar to those approved by the BLM for coal recovery on federal leases.

The Division was informed informally by the applicant that longwall mining will be used to mine most of the coal. The applicant is interested in constructing the surface facilities when possible. Therefore, they want to amend only the surface facilities portion of the MRP. Formal changes to the coal recovery section of the MRP will be submitted later. The Division cannot deny the changes to the surface facilities because the applicant plans to change the mining method. Amending the MRP in piecemeal fashion increases the total time needed to process the changes.

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Findings:

The applicant has met the minimum regulatory requirements of this section.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: R645-301-521, -301-525, -301-724.

Analysis:

Renewable resources survey.

R645-301-525.100, requires the applicant to survey the permit and adjacent areas for structures and renewable resources that have the potential for being damaged by subsidence. Section 525.100 of the PAP contains the subsidence control plan in it the applicant states:

As noted in Section 521.100, no transmission lines, pipelines, or agricultural drainage tile fields exists within the area of potential subsidence. As described in Section 527.200, the roads within the area of potential subsidence consist of private roads that are owned and maintained by the parent company of SCM. These are unimproved dirt roads that will be used for access to the lease area. While localized damage may occur to these roads from subsidence, this damage will not be monetarily significant to the owner, since the owner is the parent company of SCM. No other structures are known to exist within the area of potential subsidence.

Renewable resource lands within the permit and adjacent areas are shown on Plate 4-1 and discussed in Section 411 of this MRP. The area of potential subsidence is currently used for livestock grazing and wildlife habitat, with limited timber production on adjacent lands to the east of Dugout Canyon (see Section 411.120). Hydrologic resources in the area are discussed in Chapter 7 of this MRP. Information regarding baseline groundwater conditions is provided in Section 724.100.

The Division and applicant determined that renewable resources have the potential to be damaged from subsidence. Therefore, the applicant is required to a subsidence control plan.

Subsidence control plan.

The subsidence control plan is as follows:

- A description of the coal mining, including the size, sequence, and timing for development of underground workings.

Section 522 of the MRP discusses coal recovery. In Phase I and Phase II the applicant states that room-and-pillar mining will be used. Plate 5-7 shows the general mine and the subsidence areas. The Division has enough information to estimate when and where subsidence should occur.

- A map of the underground workings which describe the location and extent of areas in which planned-subsidence mining methods will be used. The map should show all areas where measures will be taken to prevent or minimize subsidence and subsidence related damage.

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Plate 5-7 shows the areas where subsidence is expected to occur. The mine workings shown on Plate 5-7 do not have the detail that is standard for mine maps. The Division needs a detailed mine map similar to those given to MSHA. The applicant needs to give the Division a detailed mine maps in order to meet the requirements of R645-301-525.420.

- A description of the physical conditions that affect subsidence and subsidence related damage.

In Section 627 of the MRP the applicant states:

Overburden thickness above the coal seam ranges from approximately 600 feet in the southern portions of the permit area to more than 2400 feet in the northern portions (Plate 6-4). Stratigraphically, the overburden consists of the Upper Blackhawk Formation, which contains the coal seams, the Castle Gate Sandstone, the Price River Formation, the North Horn Formation, and the Flagstaff Formation as described in Section 624.100 of this MRP.

The information in the MRP is adequate for the Division to evaluate the potential subsidence damage. The Division usually determines the area of subsidence based on the angle of draw. The angle of draw is determined from subsidence monitoring at mines with similar geology.

- A description of subsidence monitoring.

The applicant has established a subsidence monitoring network. The network consists of several control points as shown on Plate 5-7 and Table 5-2. Additional monitoring stations will be added as needed.

Subsidence monitoring will be conducted annually. The survey will be conducted on the ground until the area becomes too big for ground surveying to be feasible. The major concerns for subsidence damage are to stream and springs. The annual subsidence monitoring report will be sent to the Division.

The monitoring program is similar to those at other mines. The Division wants a program where an on the ground survey is conducted to find surface cracks and slides. The aerial surveys will be used to calculate the angle of draw.

- A detailed description of the subsidence control measures that will be taken to prevent of minimize subsidence-related damage.

There are few structures in the permit areas that need special protection from subsidence. Raptor nests and other wildlife resources that could be damage by subsidence are shown on Plate 3-2 and listed in the confidential file. The applicant has not address how the raptor nests will be protected. Stipulation number 10 in Attachment A of the permit states:

Prior to mining, the application must identify specific impacts to raptor nests, and discuss avoidance of the nests when mining. If nest avoidance is not possible then the Division will consult with USFWS, DWR and the Division will develop a raptor protection and mitigation plan.

This issue is discussed under "Protection of Fish and wildlife and Related Environmental Values."

- Other information specified by the Division as necessary to demonstrate that the operation will be

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conducted in accordance with the performance standards for subsidence control.

The applicant was not asked by the Division for any other subsidence information.

Performance Standards

The subsidence control plan has been reviewed by the Division and found to meet the minimum performance standards.

Notification

Under R645-301-525.300 the applicant must notify all owners and occupants of surface properties and structures above the underground workings. The notification will include, at a minimum an identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location where the applicant's subsidence control plan may be examined. In Section 525.300 of the MRP the applicant commits to notify all surface owners and occupants.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulation. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-525.420, The applicant needs to give the Division a detailed mine maps similar to those given to MSHA.

SLIDES AND OTHER DAMAGE

Regulatory Reference: R645-301-515.

Analysis:

In Section 515.100 of the MRP the applicant states:

If a slide occurs within the permit area that may have a potential adverse effect on the public, property, health, safety, or the environment, SCM will notify the Division by the fastest available means following discovery of the slide and will comply with any remedial measures required by the Division.

The applicant has met the minimum requirements of R645-301-515.100 by including a commitment to report slides.

In Section 515.200 of the MRP the applicant states:

If any examination of inspection of an impoundment discloses that a potential hazard is associated with that impoundment that may have an adverse effect on the public, property, health, safety, or the environment, the person who examined the impoundment will promptly inform the Division of the finding and of the emergency procedures for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division

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will be notified immediately.

The applicant has met the minimum requirements of R645-301-515.200 by including a commitment to notify the Division in case of an impoundment hazard.

Findings

The applicant has met the minimum regulatory requirements of this section.

PROTECTION OF FISH, WILDLIFE AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: R645-301-322, -301-333, -301-342, -301-358.

Analysis:

Protection and Enhancement Plan

The applicant commits to a wildlife awareness and protection training in its annual training curriculum for all employees and haulage contractors.

The plan says all power lines within the disturbed area will be raptor safe. The applicant has committed to construct in accordance with the publication "Power Line Contacts by Eagles and Other Large Birds."

The applicant commits to minimize impacts to water resources by controlling and monitoring the surface water discharge and water quality.

During construction activities, all mining and supplier personnel and their corresponding equipment will be required to stay within the disturbed area boundary. Loading, unloading, and staging of materials and equipment designated for the construction of the Dugout Canyon Mine facilities will be done within the disturbed area. DWR suggests limiting the construction period between December 1 and April 15 (dates are approximate depending on actual snow conditions).

Because construction did not begin at the mine until after April 15, the applicant satisfied the requirement of condition 4 of the March 16, 1998, permit.

Endangered and Threatened Species

No endangered or threatened plant or animal species are known within the area. As required by R645-301-358.100, the applicant must promptly report to the Division any state or federally listed endangered or threatened species within the permit area of which they become aware. Seasonal or migrating bald eagles are expected and a wintering bald eagle would not need to be reported.

Dugout Creek is within the Upper Colorado River drainage which has been designated as critical habitat for four threatened or endangered fish. Water use in this area is considered to have a potential effect on these fish. According to information in the Probable Hydrologic Consequences document, it is estimated the mine will use about 46.5 acre-feet per year. Mitigation to the Fish and Wildlife Service is required if water use exceeds 100 acre-feet each year, so Section 7 consultation should not be required.

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Bald and Golden Eagles

Raptor nests within the permit area are identified in the environmental resource section of this analysis. Every nest but one is in the area that would be subsided, and five of the seven are in the subsidence zone for the current permit term. Section 332 describes potential effects as displacement, injury or death of birds and nest destruction. The plan says that upon notification or suspicion of raptor nests in the permit boundary, the applicant will verify the existence of any nests, determine their conditions, and locate their locations in relation to recoverable resources. Information collected in this inventory will be discussed with various agency personnel, and the applicant and the agencies will determine methods of avoidance, explore alternative methods of protection or removal, and develop mitigation plans when needed.

Since the applicant is aware of five nests in the area that would be subsided in the next five years, it is possible to begin developing methods of avoidance, protection, or removal, and determining mitigation plans. These plans should be included in the mining and reclamation plan, and they need to be coordinated with the Division, Wildlife Resources, and the Fish and Wildlife Service.

Wetlands and Habitats of Unusually High Value

A 1995 letter from Robert Thompson, a Forest Service botanist, says a site inventory was conducted, and no wetlands were found within the proposed disturbed area. It is possible an extremely narrow band of wetland exists along the stream corridor, but the overriding concern for disturbance is the stream and its associated riparian area rather than any possible wetland.

A culvert will contain Dugout Creek throughout the length of the disturbed area, and this will significantly affect wildlife within the area. Section 322.200 details a plan to mitigate for the loss of riparian habitat due to the culvert. The mitigation includes seeding some very steep road fills near the stream, planting willows in some sections of the stream, and possibly installing in-stream structures to promote channel stability. The seed mix that it is believed would be used includes two introduced species that would not normally be allowed, but they are rhizomatous species that are needed to stabilize the very steep slopes. There are a few willows along Dugout Creek in the mitigation area but not nearly as many as one would expect. This may be because they have been grazed or otherwise eliminated through people's actions rather than because of the ecology. Coyote willows are present in Soldier Canyon to the west.

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-333, Because the applicant is aware of raptor nests in the subsidence area for the first permit term, it is possible to begin developing methods of avoidance, protection or removal, and determining mitigation plans. These plans should be included in the mining and reclamation plan. Coordination of plans needs to include the Fish and Wildlife Service.

This deficiency is an extension of condition 10 of the March 16, 1998, permit. This stipulation requires the applicant to identify specific impacts to raptor nests and discuss avoidance of the nests when mining. The condition is to be addressed prior to mining, but it does not need to be satisfied before initial development mining.

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TOPSOIL AND SUBSOIL

Regulatory Reference: R645-301-230.

Analysis:

Chapter 2, Soils, Sections 230 through 234, discusses the soil's operation plan for the proposed Dugout Canyon Mine. Relevant information includes soil salvage, stockpiling, and topsoil substitutes and supplements. The Analysis section discusses operational information as follows:

- Topsoil and Subsoil Removal
- Culvert Expansion Soil Removal
- Topsoil Substitutes and Supplements
- Topsoil Storage

Topsoil and Subsoil Removal

The PAP attempts to preserve and protect the natural soil resources by using soil salvage plans for maximizing soil recovery volumes for both topsoil and subsoils within Type TS soils. All B and C horizons will be salvaged in addition to salvaging the A horizon topsoil from the undisturbed, Type TS soils for salvage areas #2, 3, and 4. The undisturbed TS soils are deep rich Mollisols, with deep subsoils (B and C horizons) of excellent quality material available for salvage. These B and C horizon soils will be salvaged, segregated and stockpiled as substitute topsoil.

The estimated volumes of stockpiled soils are presented in Table 2-2 and in Appendix 2-6 which includes soil recovery calculations. Topsoil and subsoils are salvaged from the northwest facilities area (area 2) will yield 1,653 CY; the coal storage (area 3) will yield 4,869 CY; the sediment pond, slope area areas between road and creek (areas 4, 6, 7) will yield 20,118 CY; the water tank area (area 8) overburden soils will yield 247 CY; and the Dugout Creek culvert area (area 5) will yield 1,568 CY. In total, 28,455 CY of soil will be salvaged and stockpiled.

A non-biased, third party, professional soil scientist will be on-site during soil salvage to monitor and supervise soil salvage operations for the purpose of maximizing soil salvage volumes and quantities. Surface disturbance activities will only take place after topsoil removal.

Undisturbed soils marked #96 will not be disturbed although they are within the disturbed boundary. These southwest facing, undisturbed soils are therefore considered a buffer zone.

Culvert Expansion Soil Removal

Canyon Fuel Company has committed to salvage soils from steep slopes within the culvert expansion area along Dugout Creek provided that salvage operations do not jeopardize slope stability and safety of construction workers. A qualified soils scientist will decide which soils from steep slopes are suitable for salvage. The construction supervisor will decide which slopes are safe to remove soil from. By mutual agreement, the decision for soil salvage on what slopes will be made based on slope steepness, the potential for slope failure, and timing within the construction sequence. Timing is critical to help maximize safety and slope integrity during salvage operations by coordinating culvert installation and fill placement immediately after soil removal. The placed fills will stabilize the hillsides and will remain in place at final reclamation. After construction, an as-built map will illustrate which areas received salvaged and what volumes of soil were

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salvaged.

Installation of a culvert in Dugout Creek will result in the removal and storage of 1,568 CY of riparian soil. The soil removal volumes are based on the assumption and calculations provided in Appendix 2-5. Soils removed during culvert construction will be stored separately from other soils and are expressly designated for reclamation of the Dugout Creek, riparian area. Soils on the northwest facing slope of the stream on the opposite bank from the operations pad at the location of the sediment pond will not be salvaged due to their importance in stabilizing the steep stream bank. The idea of protecting the soils with geotextile fabric was discarded after it was determined that the stream bank would not be re-exposed during reclamation, since the channel will be moved westward to improve stability of the slope. Therefore this 300 foot length of streambank soils will be buried in the fill in order to stabilize the entire slope above. The Division concurs with this judgement.

Topsoil and Subsoil Removal

Soils to be salvaged prior to construction are those labeled with TS on Plate 2-2. The A, B and C horizons will be salvaged.

The estimated volumes of stockpiled soils are presented in Table 2-2 and in Appendix 2-5 (Soil Removal from Within the Culvert Expansion Area) and Appendix 2-6 (Topsoil, Substitute Topsoil, and Storage Pile Calculations). An estimated total of 28,455 CY of soil will be salvaged and stockpiled.

During a technical site visit on August 5, 1998 by Priscilla Burton, Robert Davidson, and Paul Baker of the Division and Scott Boylen of Canyon Fuels Inc., additional areas of TS soils were noted that were identified as either needing protection during operations or as requiring salvage during the expansion of the site in Phase II, as described below:

- The soils on the southwest facing slope where the north and east drainages of Dugout Creek unite. These soils will be impacted by proximity of the future coal storage pile and they should be salvaged during Phase II expansion.
- The soils on the west facing slope in the area of the coal storage pile. Most of this slope is undisturbed soil that must be salvaged during Phase II expansion. The area of salvage should be from the existing roadway at the north end of the pad to the rock outcrop at the location of the proposed transfer house (not as shown on Plate 5-2, but the new proposed location as explained by Scott Boylen, Dugout Project Engineer). The distance of salvage is approximately 300 feet.

Topsoil Substitutes and Supplements

The Facilities area (Area 1 on Plate 2-2). Soils from Area 1 will be utilized as substitute topsoil at final reclamation if they are not contaminated. Appendix 2-6 provides calculations showing that if 2 feet of material is recovered from this location, approximately 6.504 CY of additional substitute topsoil could be available after testing and approval for use. Any waste will be segregated from the soil material and material heavily contaminated with coal waste will not be used.

Culvert installation and pad construction will require importing fill. The PAP commits to demonstrate the suitability of the imported fill by determining if the fill is acid- and/or toxic-forming prior to placement. Acid and/or toxic-forming materials will not be used.

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Topsoil Storage

As stated in the PAP, the topsoil stockpile will be located at the Soldier Canyon Mine topsoil storage area (Plate 2-3) with the Dugout stockpile marked and kept separate from the Soldier Canyon Mine stored soils. A contiguous containment berm separates the Dugout soil pile from the Soldier Canyon Mine piles. The containment berm is designed as a self contained Alternate Sedimentation Control Area (ASCA). Section 231.400 gives the construction, modification, use, and maintenance of the storage piles. The pile is designed to hold a maximum volume of 17,000 CY of soil. The total projected volume of soil salvage from Dugout, culvert expansion area, and topsoil borrow is 28,455 CY of soil. An expansion of the Soldier Canyon Mine topsoil storage area is anticipated by both the applicant and the Division. An application for expansion must be filed and approved prior to approval of Phase II.

The current Soldier Canyon Mine soil stockpile is infested with Cheatgrass. Therefore, the applicant has committed to maintain, to the extent possible, the stockpile's interim vegetation in a noxious weed- and Cheatgrass-free state. Discussion has focused on controlling the Cheatgrass using both selective and non-selective herbicides in early spring before dormancy breaks with other desirable plants, and by using pre-emergent herbicides in the fall to kill germinating Cheatgrass.

The PAP states that stockpiled soil in jeopardy of being detrimentally affected in terms of soil quantity and quality by mine operations may be temporarily redistributed. Such action will only take place by prior approval of DOGM with appropriate amendment changes to the MRP.

Findings:

The applicant must provide the following, prior to approval, in accordance with the requirements of:

R645-301-234, a designated location for the storage of the additional topsoil to be generated by the expansion of Phase II. The present capacity of existing storage location (17,000 CY) will be exceeded by approximately 11,455 CY.

R645-301-232.100 Descriptions of topsoil and subsoil removal and estimates of salvage volumes during Phase II should include the two locations as discussed during a technical site visit on August 5, 1998 and as described above under the **Topsoil and Subsoil** heading.

INTERIM REVEGETATION

Regulatory Reference: R645-301-332

Analysis:

The plan includes an interim seed mixture in Section 341.200. No specific soil preparation, planting, or mulching methods are shown for interim revegetation areas, so it is assumed the same methods will be used as for final reclamation. The plan for final reclamation is discussed below.

The application says cheatgrass control has been initiated at the Soldier Canyon Mine lower topsoil stockpiles. While control has not been completely successful, it has reduced the amount of cheatgrass. The applicant will need to continue control efforts. The requirements of permit condition 5 of the March 16, 1998, permit has been met.

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Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Road Systems

R645-301-527.100, requires the applicant to classify each road in the permit area as either primary or ancillary. The primary roads in the disturbed area are the primary haul road, the coal storage pad roads, the substation access road, the portal pad access road, and the water tank access road. The ancillary road in the disturbed area is the survey monument access road. The locations of these roads are shown on Plate 5-2.

There are several dirt roads, Jeep trail and wheel tracks in the permit area. The applicant does not plan to use any of the dirt roads, Jeep trails and wheel tracks for mining and reclamation activities with the exception of using the roads for access to monitoring and data collection sites. The applicant requested the dirt roads, Jeep trails and wheel tracks that are outside the disturbed boundaries not be classified.

If the dirt roads, Jeep trails and wheel tracks are classified as ancillary roads then they must be reclaimed. The applicant owns the land and wants to retain the roads for the post mining land use. If the dirt roads, Jeep trails and wheel tracks are classified as primary roads then the applicant would have to bring those roads up to primary road standards. Bringing the dirt roads, Jeep trails and wheel tracks up to primary road standards would be expensive and provide negligible environmental protection.

Several mines in Utah have dirt roads, Jeep trails and wheel tracks used for access to monitoring and data collection sites. The Division does not require those roads be classified since they are used only for monitoring and data collection activities.

The Division will not require the applicant to classify the dirt roads, Jeep trails and wheel tracks that are outside the disturbed area boundaries provided the roads are not used for mining and reclamation activities except access to monitoring and data collection sites. If the dirt roads, Jeep trails or wheel tracks are used for any mining or reclamation activities except access to monitoring and data collection site the applicant must then classify the road.

Plans and drawings.

- (1) The applicant must include a map, appropriate cross sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures. In Section 527.200 of the PAP the applicant states:

Road Specifications. Cross sections of roads that will be used or maintained by SCM are provided in Figure 5-1. Information regarding road drainage structures is presented in Chapter 7.

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The road which will access the mine is a county road that extends from the Soldier Creek Road (Utah Highway 53) to the mine (a distance of approximately 7.5 miles). Carbon County is currently planning the upgrade of this road to handle the increased traffic which is anticipated as a result of mine operation. The County will construct the upgrade and charge SCM a toll for use of the road.

As currently anticipated, primary roads within the proposed surface facilities will have a 16-foot finished width. As indicated in Figure 5-1, the roads will consist of 2 to 4 inches of granular material, asphalt, or concrete on a compacted, in-place subgrade. The surface of the roads will generally slope at angles of 1% to 2% for drainage. The grade of the disturbed area primary roads will vary, but should not exceed 10% generally or 14% locally. Specifically, the primary haul road (see Plate 5-2A) will be constructed at a grade of approximately 7%, the coal storage pad roads will generally be constructed at a grade of 14%, the substation access road will be constructed with an approximate grade of 13%, the portal pad access road will be constructed at a grade of about 13%, and the water tank access road will exist in its current location with an approximate grade of 10 to 14%. The ancillary survey-monument access road will be graded and maintained as a dirt road.

R645-301-527.200 requires the applicant to submit detailed description of each road. The description will include a map, appropriate cross sections and specification such as: road width, road gradient, road surface, road cut fill embankment, drainage ditch and drainage structures. The Division does not have any design specifications. The plans were approved by a registered engineer and the Division considers that certification adequate.

The applicant refers to Plate 5-2A in the road specifications section. The MRP for Phase II does not contain Plate 5-2A. The applicant might be referring to Plate 5-2. The applicant needs to correct the mistake. See R645-301-121.200.

The applicant stated that Figure 1 showed adequate cross sections of the primary road. The cross sections are adequate to determine road surfacing and drainage. The cross sections are not adequate for slope stability analysis. Therefore, the applicant needs to show the location of the primary roads on the surface facilities cross sections, Plate 5-3. See R645-301-527.200.

The applicant did not include cross section for the survey monitoring station road. The applicant must include a typical cross section for the survey monument road as required by R645-301-527.200

- (2) The applicant does not propose: to locate a road in a channel of an intermittent or perennial stream, ford a perennial or intermittent stream, low water crossing.
- (3) In Section 527.200 Drainage way Alterations the applicant states:

Coal haulage trucks will enter and leave the surface facilities area in the loop shown on Plate 5-2 immediately upstream from the sediment pond. Culverting of the stream will allow a sufficient turning angle for the coal trucks to access and safely maneuver in this area.

The surface facilities at the Dugout Canyon Mine have been designed to adequately control sediment which is generated from those facilities. However, as indicated in Section 521.100 and Plate 5-2C of this MRP, past mining at the site has resulted in previous disturbance of the surface area. As a result, several areas along the banks of Dugout Creek which would otherwise not be disturbed by SCM (if the Dugout Creek culvert was not installed) contain overcast, disturbed soils which will continue to erode

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into Dugout Creek (see, particularly, The area of "OB" soils noted on Plate 2-2). Culverting of the creek will protect it from this sediment as well as from wind-blown coal fines which could otherwise be transported to the stream throughout its length within the disturbed area.

The mine surface facilities will be constructed in a narrow canyon, not dissimilar to conditions at Canyon Fuel operations located at the SUFCO and Soldier Canyon Mines. Surface storage and parking requirements at the mine site will be as follows:....

A final advantage of installing the Dugout Creek culvert throughout the disturbed area is the improved safety for surface operations that the culvert will afford. In several areas of the site the embankments into the stream have been over steepened by past activities, with vertical slopes present in selected areas where deep down cutting has occurred from past blockage of an old culvert at the site. Installation of the Dugout Creek culvert will eliminate the safety hazard associated with most of these steep slopes.

R645-301-358.400 requires that coal mining and reclamation operations be conducted in a manner that "will avoid disturbance to, enhance where practicable, restore, OR replace wetlands and riparian vegetation along rivers and streams..." (emphasis added). Installation of culverts UC-4 and UC-5 can unfortunately not be accomplished in a manner that will avoid disturbance to the riparian vegetation along Dugout Creek. However, as noted in Section 322.220 of this MRP, the lost riparian vegetation will be replaced within the Dugout Creek watershed during the operational period at a ration of three feet of replacement to every one foot of lost vegetation. This action will also immediately enhance the riparian vegetation in the areas where the mitigation is implemented.

Furthermore, during reclamation of the site, the riparian vegetation within the disturbed area will be both enhanced and restored. Enhancement of the riparian vegetation will be facilitated through the construction of reclaimed Dugout Creek channels which, as indicated in Section 762.100 of this MRP, have been specifically to improve the geomorphological stability of the stream. By increasing this stability, the riparian vegetation will be enhanced and restored along the stream to condition which more closely mimics that which probably existed prior to disturbance of the site. Hence, through installation of culverts UC-4 and UC-5, the requirements of R645-301-358.400 will be met by immediately replacing and enhancing riparian vegetation in the Dugout Canyon watershed, and by ultimately (upon reclamation) restoring the riparian vegetation within the disturbed area. The enhancement, restoration, and replacement activities will result in an improvement of the riparian system to a condition which greatly exceeds that which is present prior to installation of the culverts.

The Division finds that there is sufficient justification placing the culverts in Dugout Creek and the tributary.

Road Specifications.

Figure 5-1 shows typical cross sections for the primary roads. However, the applicant did not give the Division typical cross sections for the survey monument road. Since the two roads are significantly different the applicant must provide the Division with cross section for the survey monument road. The applicant is required under R645-301-527.200 to give the Division cross section for each road.

The road which will access the mine is a county road that extends from the Soldier Creek Road (Utah Highway 53) to the mine (a distance of approximately 7.5 miles). Carbon County is currently planning the upgrade of this road to handle the increased traffic which is anticipated as a result of mine operation. The County will construct the upgrade and charge SCM a toll for use of the road.

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As currently anticipated, primary roads within the proposed surface facilities will have a 16-foot finished width. As indicated in Figure 5-2, the roads will consist of 2 to 4 inches of granular material, asphalt, or concrete on a compacted, in-place subgrade. The surface of the roads will generally be sloped at angles of 1% to 2% for drainage. The grade of the disturbed area primary roads will vary, but should not exceed 10% generally or 14% locally.

The remaining roads within the permit area that may be used by SCM are private roads that are owned and maintained by Canyon Fuel Company, LLC. These roads are private, unimproved dirt roads and will be used for access to the lease area surfaces for the collection of monitoring data (environmental and subsidence data) as well as other uses deemed appropriate by the landowner.

The applicant did not include cross sections for the dirt roads located outside the disturbed area boundaries in the MRP. The applicant has told the Division that the existing dirt roads will not be used for coal mining and reclamation activities with the exception of passive activities such as access to monitoring and sampling points. The Division allows other mines to have unclassified dirt roads in the permit areas provided the roads are only used for passive coal mining and reclamation activities. The Division will not require any road outside of the disturbed area to be classified. However, if the applicant uses any unclassified dirt road for any nonpassive coal mining or reclamation activities then the applicant must classify the dirt road and include it into the disturbed area.

In Section 542.600 of the PAP the applicant states:

All roads not to be retained for an approved postmining land use will be reclaimed immediately after they are no longer needed for mining and reclamation operations. Roads which will be retained through the disturbed area for access to private land within the permit area are noted on Plate 5-5. All remaining roads within the disturbed area will be reclaimed. All roads to be reclaimed will be graded and /or backfilled as indicated above. Topsoil will be applied to the regraded surfaces and the area will be revegetated as discussed in Chapter 2 and 3 respectively.

Roads within the disturbed area have been designed with a width of 16 to 20 feet (see Section 527.200). The main canyon access road up and downstream from the proposed disturbed area has a current width which generally ranges from 16 to 25 feet, averaging approximately 20 feet. Hence, post-reclamation retention of a road with a width of 16 to 20 feet will be compatible with adjacent roads, including those roads upstream from the disturbed area which will not be altered by mining activities. Therefore, this road width is considered appropriate for the post mining land use.

In Section 534 the applicant states:

534.100 Location, Design, Construction, Reconstruction, Use, Maintenance, and Reclamation

Control of Damage to Public or Private Property. All roads used by SCM have been or will be designed in accordance with applicable county and State standards. By designing according to these standards, damage to public or private property will be minimized.

The Division does not have specific design standards for roads. The primary road has been certified by a registered professional engineer and is considered adequate by the Division. The applicant did not give the Division detailed cross sections for design specification for the ancillary roads. Those issues have been addressed in other section of the TA.

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Road Surfacing.

The applicant states in Section 527.200:

As indicated in Figure 5-1, the roads will consist of 2 to 4 inches of granular material, asphalt or concrete on a compacted, in-place subgrade. ... The ancillary survey-monument access road will be graded and maintained as a dirt road.

The Division does not has standards for road surfacing requirements. The primary road surfacing materials proposed by the applicant are similar to those used in other coal mines. Those materials have been adequate for other coal haulage roads. Therefore, the Division considers those surfacing materials adequate.

The ancillary road to the subsidence monitoring station should have little traffic. The dirt surfacing should be adequate.

The applicant committed to maintain all roads in the permit area. If the proposed road surfacing materials are inadequate the applicant will be required to maintain the roads.

Slope Stability.

The slope stability analysis for the roads is in Appendix 5-4. The location map in Appendix 5-4 shows the elevation at the bottom of the sediment pond to be 6975 feet. The bottom of the sediment pond is shown as 6950 feet on Plate 5-2. The cross section in Appendix 5-4 used for the stability analysis shows a retaining wall next to the sediment pond. The cross sections on Plate 5-3 show no retaining wall near the sediment pond. The cross section used to in the stability analysis must represent field conditions.

Environmental Protection and Safety

The design and reconstruction of the access road will be the responsibility of Carbon County. Safety and environmental protection were primary concerns during the design of other roads within the surface-facilities area. The grade, width, and surface materials used for the roads were selected to be appropriate for the planned duration and use of the roads.

Primary Roads

All primary road designs have been certified by a registered professional engineer. All roads in the disturbed area are considered primary except for the road to the subsidence monitoring point. The regulations do not require that designs for ancillary roads be certified. However, ancillary roads must meet the same performance standards as primary roads.

Road Alignment.

Selection of the final alignment of the reconstructed access road will be the responsibility of Carbon County. The alignment will be located generally along the alignment of the existing dirt road. The current road location had been in existence for many years and had not experienced major stability problems. Thus, the road will be located on the most stable available surface, giving consideration also to safety and environmental protection.

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Road Surfacing.

In Section 527.200 of the PAP the applicant states:

As currently anticipated, primary roads within the proposed surface facilities will have a 16 foot finished width. As indicated in Figure 5-1, the roads will consist of 2 to 4 inches of granular material, asphalt, or concrete on a compacted, in-place subgrade. The surface of the roads will slope at angles of 1 to 2 percent for drainage.

The applicant gave the Division the specifications for the road surface. The Division does not have specific requirements for road surfaces. The Division usually relies on the design specification of the engineer who designed the road. The Division has no reason to believe that the road designs are inadequate.

Road Maintenance.

The access road will be maintained by Carbon County. The applicant committed in Section 527 subheading Road Maintenance all private roads in the permit area.

Road Culverts.

Culverts to be installed within the surface facilities have been designed in accordance with the hydrologic criteria discussed in Section 742.300. These culverts will be installed in accordance with manufacturer's recommendations to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

Performance standards.

The applicant has met all the engineering performance standards for primary roads with the exception of demonstrating that the embankment have a safety factor of 1.3 or greater. Those engineering stands include:

- Prevent or control damage to public or private property
- Use nonacid- and nontoxic-forming substances in road surfacing
- Maintain all roads to meet the performance standards of this part and any additional criteria specified by the Division. A road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred.
- The construction or reconstruction of primary roads shall be certified in a report to the Division by a qualified registered professional engineer, or in any State which authorizes land surveyors to certify the construction or reconstruction of primary roads, a qualified registered professional land surveyor, with experience in the design and construction of roads. The report shall indicate that the primary road has been constructed or reconstructed as designed and in accordance with the approved plan;
- Each primary road embankment shall have a minimum static factor of 1.3. The Division may establish engineering design standards for primary roads through the State program approval process, in lieu of engineering tests, to establish compliance with the minimum static safety factor of 1.3 for all embankments;

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- Primary roads shall be surfaced with material approved by the Division as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road.

Primary road certification.

The applicant has provided certified maps and plans for the primary road design as required by R645-301-512.250

Other Transportation Facilities.

In Section 521.100 the applicant states:

Three material handling conveyors will be constructed on the surface at the mine site. As noted on Plate 5-2, the mine conveyor will transport coal from the mine to the coal stock pile. The reclaim belt will convey coal from the stock pile (via a reclaim tunnel) to the crushing facility. The loadout belt will convey coal from the crusher to the truck loading bin, from which the coal will be loaded into trucks for off-site transport. Each conveyor will be of sufficient size to handle the production levels coming from the mine and the anticipated truck loading rates, Conveyor widths will range from 42 to 60 inches.

Findings:

R645-301-527.200, The applicant has not met the minimum regulatory requirements of this section. The applicant must show the location of the primary and ancillary roads on Plate 5-3 as required by R645-301-527.200.

R645-301-527.200, The applicant has not met the minimum regulatory requirements of this section. The applicant must provide the Division with typical cross section for the survey monument road as required by R645-301-527.200.

R645-301-121.200, The applicant must change the reference of Plate 5-2A to Plate 5-2 in the MRP.

R645-301-534.130, The applicant must use cross sections in the stability analysis that are similar to field conditions. The applicant must also include a stability analysis for the survey monument road.

SPOIL AND WASTE MATERIALS

Regulatory Reference: R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Noncoal

In Section 528.300 of the PAP the applicant states:

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Non-coal (non-waste rock) waste generated in the permit area will be temporarily stored in a dumpster to be situated at a convenient location within the disturbed area. This dumpster will be located adjacent to the office/bath house shown on Plate 5-2. This waste will be disposed of periodically through Carbon County at a permitted landfill.

Liquid wastes such as oil and solvents will be contained and disposed of or recycled, in accordance with applicable State and Federal regulations, at facilities which are permitted to accept such wastes. Small quantities of such wastes (e.g. resulting from cleanup or small spills, etc.) May be contained onto absorbent pads prior to disposal. In all cases, disposal and/or recycling will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

No non-coal (non-waste rock) waste will be permanently disposed of within the permit area other than, potentially, some durable rock-type construction materials such as cinder block, which may be disposed of underground. Non-coal (non-waste rock) waste will be temporarily stored at the site prior to permanent off-site disposal either in a dumpster or in the temporary waste-rock storage area. Off-site disposal will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

It is currently anticipated that no non-coal waste that is defined as hazardous under 40 CFR 261 will be generated at the mine. If such waste is generated in the future, it will be handled in accordance with the requirements of Subtitle C of the Resource Conservation and Recovery Act and any implementing regulations.

The applicant committed in Section 528.300 of the PAP to dispose of all non-coal waste in either in state approved landfill or in an on site disposal area. The applicant has committed to dispose of all non-coal waste in an approved manner.

Coal Mine Waste

The Division defines coal mine waste as coal processing waste and underground development waste. Coal processing waste means earth materials separated from the coal during cleaning, concentrating, or the processing or preparation. In Section 528.300 of the PAP the applicant states that SCM will not process their coal at the Dugout Canyon Mine beyond crushing. Thus, the applicant will generate no coal processing waste in the permit area.

The Division defines underground development waste as waste-rock mixtures of coal, shale, claystone, siltstone, limestone, or related materials that are excavated moved, and disposed of from underground workings in connection with underground coal mining and reclamation activities. In Section 528.200 of PAP the applicant states:

Underground development waste which is generated at the Dugout Canyon Mine will be disposed of either:

- Underground within the Dugout Canyon Mine;
- At the approved water-rock disposal facility at the SUFCO Mine; or
- At the approved waste-rock disposal facility at the Skyline Mine

Description of the waste-rock disposal facilities at the SUFCO Mine and the Skyline Mine are provided in their respective MRP's. A discussion of disposal of development waste in the underground workings of the Dugout Canyon Mine is provided in Section 536.500 of this MRP.

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The Division approved the disposal of waste rock material generated at the Dugout Mine to be placed in the waste rock disposal facilities at both the Skyline and SUFCO mines.

Refuse piles.

In Section 513.400 of the PAP the applicant states:

“Waste rock generated from the Dugout Canyon Mine may be temporarily stored on the surface of the mine site at the location shown on Plate 5-2A. This storage will be for a short period of time prior to ultimate disposal either underground or in the waste-rock disposal areas associated with the SUFCO and/or Skyline Mines. Waste rock will be disposed of after a truck load of material accumulates or every 3 months, whichever is shorter. The short-term nature of this storage precludes the need for special precautions related to spontaneous combustion of the stored materials. Runoff from the stored materials will drain to the site sedimentation pond.

In Section 536 of the PAP the applicant states:

The coal mine waste generated from the Dugout Canyon Mine may be temporarily stored on the surface of the Dugout Canyon Mine facilities at the location shown of Plate 5-2A prior to ultimate disposal. Coal mine waste which is stored at the mine site will be removed from the temporary waste rock storage area and placed in its final disposal area at least once each calendar year. Runoff from the temporary waste rock storage area will report to the mine site sedimentation pond and be treated accordingly. During the period of temporary storage, berms will be installed around the temporary storage area to contain and direct runoff to ditch DD-2a (see Plate 7-5). The berms around the temporary waste rock storage area are not noted on Plate 7-5 or elsewhere since these will be located as necessary, depending upon the extent of the waste rock storage.

The applicant states in Section 513.400 that the material in the temporary storage site will be removed every three months or less.

After the applicant submitted Phase II, they submitted amendment 98C. That amendment modifies the refuse pile operations. Those changes are not included in Phase II. If the Division approves 98C before Phase II, then the approval of Phase II would void amendment 98C. The applicant needs to modify Phase II to contain all changes proposed in 98C or wait until Phase II has been approved and then submit 98C. The applicant has not met the requirements of R645-301-121.200.

Impounding structures

In Section 533 of the PAP the applicant states:

“The only impoundment with an embankment that will be constructed, used, or maintained by SCM will be the sedimentation pond at the mine surface facilities (the remaining two impoundments noted on Plate 7-5 will be totally incised).. A slope-stability analysis which was performed on this pond embankment is provided in Appendix 5-4. According to this analysis, the minimum safety factors for the sedimentation pond embankment are 4.2 under static unsaturated conditions, 2.1 under static saturated conditions, and 1.6 under seismic saturated conditions. All analyses were performed assuming that the pond was full to its maximum design depth. These safety factors exceed the minimum requirements of R645-301-533.100.

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The applicant did not address the stability of the two incised ponds. The Division looked at the cross sections of the ponds and saw that the width of the embankment is more than 5 times the height. That ratio is large enough to ensure that the ponds will be stable.

Foundation Considerations

Soils investigations have been conducted at the site of the proposed surface facilities. Results of these investigations are presented in Chapter 2 and Appendix 5-4 of this MRP. During these investigations, foundation conditions in the area of the proposed sedimentation pond were evaluated. Based on these investigations, no conditions were encountered which suggested that the foundations upon which the pond would be constructed would be unstable. The slope-stability analyses presented in Appendix 5-4 indicate that the pond foundations will also be stable under operating conditions.

Prior to construction of the sedimentation pond, all vegetative matter and topsoil will be removed from the foundation area. Detailed cross sections of the sedimentation pond are presented on Plate 7-4 of this MRP.

Slope Protection

The outslopes and inslopes of the sedimentation pond will be revegetated following construction to minimize surface erosion and protect the embankments against sudden drawdown. The seed mix to be used for this revegetation effort is described in Section 341.200 of this MRP.

In the event of a storm, rapid drawdown in the sedimentation pond would be restricted to the vertical distance between the spillway and the peak water level, a distance of 0.20 foot (Plate 7-4). Drawdown of this magnitude is not considered significant and, therefore, not of erosional concern.

During normal decant of the sedimentation pond, flow rates (and drawdown) will be controlled. Hence, it is unlikely that this drawdown will cause surface erosion of the embankment face.

Embankment Faces

Embankment inslopes and outslopes will be revegetated following construction of the sedimentation pond, as outlined in Section 533.300. Riprap will also be placed on the upstream face of the embankment near the discharge structure.

Highwalls

No highwalls will be located below the water lines of the sedimentation pond.

MSHA Criteria

The sedimentation pond does not meet the size criteria of 30 CFR 216(a).

Pond Operation and Maintenance Plans

The sedimentation pond has been designed in accordance with R645-301-740. Details of these designs, and the requirements for operation and maintenance of the pond, are presented in Chapter 7 of this MRP.

The sediment pond and the two incised pond are the only impoundment at the mine site. The sediment pond does not meet the criteria for being classified as an MSHA pond because the structure is less than 20 feet

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high, does not impound more than 20 acre-feet nor is the sediment pond located where failure would be expected to cause loss of life or serious property damage. Sediment ponds that do not meet the MSHA criteria have fewer stringent design and performance standards.

The designs for the sediment pond are in Appendix 7-8 of the PAP and on Plate 7-4. A registered professional engineer certified the designs and drawing.

The report on the slope stability analysis is in Appendix 5-4. The engineer that did the analysis concluded that the minimum safety factors for the sediment pond embankment are 4.2 under static unsaturated conditions, 2.1 under static saturated conditions and 1.6 under seismic saturated conditions.

Stability during rapid drawdown is discussed in Appendix 5-4 of the PAP. The analysis indicates that the upstream slope of the embankment will be stable and have a safety factor of 1.6. Only the upstream slope was evaluated for stability during rapid drawdown. The applicant believes that when rapid drawdown does occur failure will first occur on the upstream slope. The Division agrees with that belief and considered the rapid drawdown analysis adequate.

Burning and Burned Waste Utilization

In Section 528.300 of the PAP the applicant states:

If coal mine waste fires occur at the SUFCO and Skyline Mines, they will be controlled in the manner outlined in their respective permits.

Waste rock will only be temporarily stored at the surface of the Dugout Canyon Mine prior to ultimate disposal. If spontaneous combustion of this material does occur, the burning section will be removed from the pile using a backhoe or other appropriate means. The affected waste rock will then be spread so that the material can cool and mixed with soil to extinguish the fire. The extinguished material will then be returned to the waste pile.

The plan to handle burning waste rock is adequate. The plan is similar to those used by other mines and the Abandoned Mines Land Program.

Return of coal processing waste to abandoned underground workings.

In Section 536.500 of the MRP the applicant states:

Coal mine waste generated at the Dugout Canyon Mine will be disposed of at either the approved SUFCO facility, or the approved Skyline facility, or in underground workings within the permit area. The source of this material will be primarily waste rock resulting from partings and splits in the coal seam. As indicated in Chapter 6, neither acid- nor toxic-forming materials are present in the overburden, underburden, or coal (i.e., the material that will comprise the waste rock that will be generated from the Dugout Canyon Mine). Prior to the disposal of underground development waste within the permit-area mine workings, approval for such disposal will be obtained from MSHA.

The Division reviewed the plan for disposing of coal mine waste underground and determined that the plan meets the minimum regulatory requirements of Section R645-301-536.500. Prior to implementing the plan MSHA must also approve the plan. The applicant has the responsibility of providing the Division with proof that MSHA has approved the plan.

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Excess Spoil

In Section 512.200 of the Pap the applicant states that they will generate no excess spoil from the permit area. The applicant has met the minimum regulatory requirements for handling excess spoil.

Findings:

Refuse piles.

R645-301-121.200, The applicant needs to clarify if they want the amendment 98C incorporated into Phase II. If the applicant wants amendment 98C incorporated into Phase II then they need to amend Phase II.

R645-301-536.500 and R645-301-521.190 The applicant did not provided the Division with proof that MSHA has approved the plan to dispose of coal mine waste underground. Since the Applicant provided all other information the Division should approve the underground disposal of coal mine waste on the condition that prior to underground disposal the applicant show MSHA has approved the plan.

HYDROLOGIC INFORMATION

Regulatory Reference: R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Underground mining and reclamation activities are planned to be conducted to minimize disturbance of the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, and to support approved postmining land uses in accordance with the terms and conditions of the approved permit and the performance standards of this part. The Division has not required additional preventative, remedial, or monitoring measures to assure that material damage to the hydrologic balance outside the permit area is prevented.

Baseline and operational water-monitoring data obtained since the original PAP was prepared need to be included in the proposed amendment to the MRP and evaluated as part of the PHC determination.

There is no SPCC in the MRP nor any indication a SPCC has been prepared for the Dugout Canyon Mine. Page 7-50 states a commitment to prepare a SPCC.

By defining terms, stating objectives, and identifying responsibilities, UDOGM Coal Regulatory Program Directive Tech-004 (Tech-004) is meant to clarify the Division's position on what constitutes an appropriate monitoring program and provides methodology for consistently amending these monitoring programs. Under Tech-004, amendments to monitoring programs will be approved on a site specific basis.

The monitoring plan at Dugout Canyon Mine conforms to the amended monitoring plan approved for the Soldier Canyon Mine, which is based on Tech-004. The amended Soldier Canyon Mine monitoring plan was approved in accordance with the procedure in section 5E of Tech-004:

- a. Canyon Fuel Company appears to be the owner of the surface in all areas where monitoring

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- was stopped. Canyon Fuel Company also owns the water rights for the springs that have been removed from the monitoring plan. The only surface-water right involved that is not owned by the mine is upstream of the mine, beyond the area affected by subsidence, and the monitoring point on that reach of stream is to be replaced by one downstream, closer to the mine.
- b. Historical quality data show that, except for some problem samples, a good cation/anion balance exists with these data.
 - c. Data can be used in a regression analysis to demonstrate that conductivity correlates to the specific water quality of that site, as measured by TDS.
 - d. The site is not critical to the ongoing PHC determination.
 - e. Monitoring is no longer necessary to achieve the purposes set forth in the approved monitoring plan.
 - f. Subsidence monitoring information indicates that further subsidence is not likely and that future mining will not occur in adjacent areas that could affect these water sources.

Sites above and below the disturbed areas and discharge points of both the Soldier Canyon (G-5, G-6, and G-10) and Dugout Canyon Mine (DC-1, DC-2, and DC-3) are monitored quarterly for flow and operational field and laboratory parameters.

Ground-water monitoring.

Wells GW-10-2, GW-11-2, and GW-24-1 (all completed in the Castle Gate Sandstone) and springs SC-65 (Colton Formation), SP-20 (Flagstaff Formation), SC-14 (North Horn Formation), and SC-100 (North Horn Formation at Price River Formation contact) will be used to monitor ground water conditions in the proposed Dugout Canyon Mine permit area. Locations of wells and springs to be monitored are on Plate 7-1. Ground-water monitoring protocols are given on pages 7-53 through 7-56.

Quarterly operational monitoring of springs at Dugout Canyon Mine, as at the adjacent Soldier Canyon Mine, has been reduced to field parameters only: flow, pH, specific conductance, and temperature. During the first "wet" year and first "dry" year following permit issuance, flows will be measured weekly between April 1 and August 31, with the intent of preparing base flow hydrographs from the data. Instead of one complete operational sample to be collected yearly during the low flow season (August or September) as outlined in Tech-004, operational water-quality parameters will be determined semi-annually during these "wet" and "dry" years only; this is the one notable variation from Tech-004.

Operational ground-water quality parameters to be monitored at the Dugout Canyon Mine are listed in Table 7-4 of the MRP. They correspond with the operational parameters in Table 4 of Tech-004 except that total alkalinity and hardness are not included.

Water depth in wells will be monitored quarterly.

For springs, Tech-004 recommends that water quality samples be analyzed for baseline parameters every fifth year, the samples to be collected at low flow either during the year preceding re-permitting or at midterm review. For other ground-water quality monitoring sites the samples for analysis of baseline parameters can be collected anytime during the same year. There is no provision for this 5-year monitoring in the operational ground-water monitoring plan.

Surface-water monitoring.

Sites DC-1, DC-2, and DC-3, located above and below the disturbed areas and UPDES discharge points, are to be monitored quarterly for flow and operational field and laboratory parameters. In addition DC-

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2, DC-3, DC-4, and DC-5 are to be monitored weekly between April 1 and August 31 during the first "wet" year and first "dry" year following permit issuance: flows will be measured with the intent of preparing base flow hydrographs from the data, and samples will be collected semi-annually at DC-4 and DC-5 for laboratory analysis of operational water-quality parameters.

Surface-water monitoring protocols are given on pages 7-56 through 7-59. Operational surface-water quality parameters to be monitored at the Dugout Canyon Mine are listed in Table 7-5 of the MRP. They correspond with the operational parameters in Table 3 of Tech-004 except that total alkalinity and hardness are not included.

For surface water, Tech-004 recommends one water quality sample at low flow every fifth year, either during the year preceding re-permitting or at midterm review, to be analyzed for baseline parameters. There is no provision for this in the operational surface-water monitoring plan.

Acid and toxic-forming materials.

Analyses presented in Chapter 6 of the proposed Phase II MRP indicate that acid- and toxic-forming materials are not present within the permit area. Parameters defining acid- and toxic-forming materials will periodically be monitored as described in Chapter 6. In the event that acid- or toxic-forming materials are identified, they will be disposed of in appropriate waste-rock disposal facilities as described in Chapter 5 of the proposed Phase II MRP. No storage of acid- and toxic-forming materials and underground development waste is planned for the Dugout Canyon Mine. (Although not part of this permit submittal, future development of a waste-rock disposal site has been contemplated.) Waste rock will not be used during reclamation, and soil substitutes will be used only if their chemical and physical properties are determined to be adequate through appropriate analyses.

Transfer of wells.

Ownership of wells will be transferred only with prior approval of UDOGM and the conditions of such a transfer will comply with State and local laws. Soldier Canyon Mine will remain responsible for management of the wells until bond release. This is discussed on page 7-59 under Section 731.400.

Discharges into an underground mine.

In Section 513.600 of the PAP the applicant states that no discharges will occur from the surface to mine workings underground.

Gravity discharges.

No gravity discharges will be made from an underground mine in the permit and adjacent areas (p. 7-60).

Water quality standards and effluent limitations.

Discharges of water from disturbed areas will be in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining contained in 40 CFR Part 434 (p. 7-90).

Diversions.

Dugout Creek and its eastern tributary will be routed under the entire disturbed area in a 60-inch corrugated metal culvert. The culvert has been sized giving due consideration to the watershed runoff

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characteristics, including vegetation types, soil types, and the harvesting of timber above the mine site. DOGM calculations indicate the culvert is conservatively designed using minimum slopes resulting in a capacity 25.3% greater than the design event. There is a hydraulic jump energy dissipator at the downstream end of the culvert which is designed to have a water exit velocity slightly less than the natural stream channel velocity. This should result in minimum erosion problems to the stream channel below the disturbed area.

Plate 7-5, and some of the other plates, show a culvert at the extreme lower end of the disturbed area. This culvert is not designated and no design information could be found. Since it is inside the disturbed area, it is part of the MRP and must have design information provided. The design needs to include the inlet and outlet design to minimize erosion. It will probably be necessary to provide an energy dissipator or riprap at the culvert outlet to prevent erosion.

This situation is unique in that this culvert is directly and immediately downstream of the energy dissipator at the outlet of the main culvert under the disturbed area. In addition, there is a substantial side drainage entering Dugout Creek at the inlet to the undesignated culvert. Further, the stream bends and the flow exiting the energy dissipator does not run straight into the culvert. There is potential for high flows to seriously damage the road at the upstream inlet to the undesignated culvert. Consideration should be given to reorienting the energy dissipator, or the undesignated culvert, or both, to better align them and provide a smooth flow between them and still allow for the side drainage. It may be best to provide a second separate culvert under the road to accommodate the side drainage.

The county road ending in this area is not relevant to this issue since it is all contained within the disturbed area.

Stream buffer zones.

Stream buffer zones are designated and markers will be placed adjacent to Dugout Creek within the disturbed area noted on Plate 5-2A. Each buffer zone marker will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area. Page 5-21 further delineates stream buffer zone marker locations and intervisibility between signs.

Sediment control measures.

Measures to control sediment include the main sediment pond, containment berms, silt fences, and straw bales. The runoff and sediment control plan has been designed to ensure the operations within the disturbed area should not cause or contribute to degradation of water-quality or the stream channel quality.

Siltation structures.

The sediment pond is the only siltation structure proposed in the application. It is discussed below.

Sedimentation ponds.

Although the disturbed area has been made larger, the surface hydrology aspects of the area remain basically the same. That is, the sediment pond is at the lowest end of the site and the ditches and culverts are in the same locations. The disturbed drainage areas and undisturbed drainage areas changed somewhat, generally becoming larger. The runoff curve numbers remained the same as previously approved.

The pond was designed using the appropriate 10-year, 24-hour design event. The primary spillway

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was designed using the appropriate 25-year, 6-hour event. Water exit velocity is below that of the natural stream flow. There is a separate emergency spillway which discharges into Dugout Creek with appropriate riprap protection. The emergency spillway was designed using the appropriate 25-year, 6-hour event. The pond has a decant with valve control and the pond has adequate sediment storage and storm event volume. The applicant has committed to pond construction before mining begins.

Other treatment facilities.

There are no other treatment facilities in the project.

Exemptions for siltation structures.

ASCA areas are discussed on page 7-71 and are shown on Plate 7-8. Considering the road drainage, ASCA-2 should continue along the road to the edge of the disturbed area. With that, it seems appropriate to combine ASCA-1 and ASCA-2 into one area. Similarly, page 7-72, para. one, indicates the maintenance of ASCA-1 will end when the area is no longer used for a staging area. The applicant needs to commit to contemporaneous reclamation of the area once maintenance ends.

The county road ending in this area is not relevant to this issue since it is all contained within the disturbed area.

Discharge structures.

There are discharge structures to accommodate flows from the sediment pond primary spillway and emergency spillway as well as discharges from the mine itself. All of these discharges have been designed using the appropriate design event, to have water velocities below that of the natural stream, and to be protected from erosion.

There is a large hydraulic jump energy dissipator at the downstream end of the Dugout Creek culvert which is designed to have a water exit velocity slightly less than the natural stream channel velocity. The energy dissipator is over 56 feet long and nine feet wide with two- to three-foot thick rock lining. This should result in minimum erosion problems to the stream channel below the disturbed area.

Impoundments

- In Section 533.600 of the PAP the applicant states that the sediment pond does not meet the size criteria of 30 CFR 216(a).
- Richard White a registered professional engineer certified the designs for the sediment pond.
- The embankment stability study for the sediment pond is in Appendix 5-4. The cross section in Appendix 5-4 do not correspond to the cross sections in Plate 5-3. The pond elevation in Figure 1 of Appendix 5-4 do not correspond to the elevation in Plate 5-2. The applicant failed to provide the Division with slope stability analysis that shows the sediment pond will be stable.

In Section 533.200 of the PAP the applicant states:

The applicant has conducted soil investigations at the site of the proposed surface facilities. Results of these investigations are presented in Chapter 2 and Appendix 5-4 of this MRP. During these investigations, the applicant evaluated foundation conditions in the proposed sedimentation pond.

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Based on these investigations, the applicant encountered no conditions which suggested that the pond's foundations would be unstable. The slope-stability analysis presented in Appendix 5-4 shows that the pond foundations will also be stable under operating conditions.

Prior to construction of the sedimentation pond, all vegetative matter and topsoil will be removed from the foundation area. Detailed cross sections of the sedimentation pond are presented on Plate 7-4 of this MRP.

The location of the sediment pond in Phase II is different than the sediment pond in Phase I. The applicant needs state that they have investigated the foundation conditions at the new site. The applicant did not meet the minimum requirements of R645-301-533.200.

In Section 533.300 of the PAP the applicant states:

The outslopes and inslopes of the sedimentation pond will be revegetated following construction to minimize surface erosion and protect the embankments against sudden drawdown.

The analysis presented in Appendix 5-4 indicates that the upstream slope of the embankment will be stable under conditions of rapid drawdown (minimum safety factor of 2.0)

The cross section in Appendix 5-4 show a retaining wall next to the sediment pond. Plate 5-2 and Plate 5-3 show that there is no retaining wall next to the sediment pond. The cross section in Appendix 5-4 does not match those in Plate 5-2 and Plate 5-3. The applicant must use cross sections in the stability analysis that represent field conditions. The rapid draw down analysis in Appendix 5-4 is not valid. The applicant failed to meet the requirements of R645-301-533.300.

In Section 533.500 of the PAP the applicant states that no highwalls are below the water lines of the sediment pond. The Division agreed with that statement and concluded that the applicant has met the minimum requirements of R645-301- 533.500.

In Section 514.300 of the PAP the applicant states that:

Regular inspections will be made during construction of the sedimentation pond as well as upon completion of construction. These inspections will be made by or under the direction of a registered professional engineer experienced in the construction of similar earth and water structures.

Annual inspections of the sedimentation pond will continue until removal of the structure or release of the performance bond. A certified report of inspection will be prepared by a qualified registered professional engineer and submitted to the Division within two weeks after each inspection. The report will discuss any appearances of instability, structural weakness or other hazardous conditions, depth and elevation of any impounded waters, existing storage capacity, and existing or required monitoring procedures and instrumentation, and any other aspects of the structure affecting stability. A copy of this report will also be maintained at the mine site.

No impoundments are anticipated within the permit area that are subject to 30 CFR 77.216.

The applicant has committed to meet the requirements of R645-301-514.311 to R645-301-514.313. Inspections will be done during the critical phases of construction and copies of the reports will be available on site. A qualified registered professional engineer will inspect the pond annually.

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Casing and sealing of wells.

Procedures for casing and sealing, capping, backfilling or otherwise properly managing drilled holes, exploration holes and boreholes, and wells are discussed on pages 5-68, 6-18, 7-69, 7-90, and 7-91.

Hydrologic Balance Protection.

Several places in the MRP reference a mine water discharge to Dugout Creek. These include pages 7-49, 7-52, 7-69, and the UPDES Permit Appendix. Commitment is made to provide erosion protection if the discharge is outside of a culvert. In order to meet the coal regulatory program monitoring requirements, the applicant will need to define for themselves where and how the samples will be taken. The applicant is cautioned that this needs to take into account the MSHA and related safety issues attendant to the sampling, for example, inside culverts if that's where it occurs.

There are a minimum of four silt fences to be placed across Dugout Creek before installation of the culvert is begun. These need to remain in place until AFTER ALL construction is complete since these are the last line of defense to prevent sediment from leaving the site. Presently the plan calls for them to be removed as construction proceeds. This was called out in the last TA and has not been corrected.

Several places in the MRP reference the use of straw bales as shown in Figure 5-4 for sediment control. The methods of bale orientation and securing the bales are NOT the Best Technology Currently Available. The applicant can reference numerous design manuals, available from DOGM and elsewhere, for more current and effective designs.

Plate 7-5 shows no riprap protection for the outlets of Culverts DC-8 and DC-9. This would result in erosion at the culvert outlets. The applicant needs to provide riprap at the culvert outlets.

Appendix 7-9, page 20 shows most of the ditches in the disturbed area are concrete lined which is optimal for erosion protection. Some less-steep sections do not need concrete and are riprap lined.

Analysis:

Although the Probable Hydrologic Consequences have already been evaluated, on March 6, 1998 BLM sent a letter to the Utah Division of Water Rights indicating several concerns on the Dugout Mine stream alteration permit. While most of the concerns were administrative in nature, one of the issues raised was the possible interruption of groundwater recharge due to culverting the stream over a 1970 foot length. This has been determined to be not a significant problem for the following reasons.

Examination of the Geologic Map of Pine Canyon Quadrangle shows the formation in the mine disturbed area is the Blackhawk, including sandstone, siltstone, and shale. That is underlain by the Mancos Shale. All of these formations have low water conductivity. There are two faults on the entire quadrangle. One is 300 feet long and the result of cliff face slumping while the other is located two miles northeast of the disturbed area on the outer edge of the Dugout Creek drainage. There are no faults in the disturbed area where the culvert will be placed. There are two vertical joints in the disturbed area, but since there is no displacement, they are not believed to contribute to water infiltrations.

The dip, or slope, of the strata is 6 degrees to the north, while the stream flow is to the southwest. This is consistent with the Castle Gate Potentiometric Surface as shown on Plate 7-3 of the mine plan which shows the gradient of the surface sloping to the north-northwest. The Castle Gate formation is above the Blackhawk. There are no known regional aquifers in the area.

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While there is alluvium in the stream at the mine site, it is thin and not shown on the geologic map. About 1500 feet downstream from the disturbed area Quaternary alluvium and pediment gravels are shown. By way of perspective the Dugout Creek drainage area above its confluence with Grassy Trail Creek (near Utah Highway 6) is over 43 square miles or 27,520 acres, as compared to the mine disturbed area of 10.4 acres. Similarly, the culvert would occupy 1,970 feet of the over 9.5 miles, or 50,160 feet, of stream channel between the mine and Grassy Trail Creek.

Water will not be lost by passing through the culvert. The water will be returned to the natural stream channel at the outlet where it will continue to recharge the groundwater in the area. There is no evidence to suggest that the reach of stream occupied by the culvert is of special significance to such recharge. Interestingly, other studies, such as Wadell, and Price and Plantz show considerable variation in streams gaining and losing flow with water stage as they cross the Blackhawk formation. Similar variation is found with the base flows contributed to the stream by springs above the mine site.

USGS has monitored a site at the lower end of the disturbed area for several years. Unfortunately, no monitoring was done above the site to define whether the disturbed area is a gaining or losing section. From the initial submission, the Mining and Reclamation Plan has in it, plans to monitor above and below the site to determine a gain-loss hydrograph. One set of observations was made on August 27, 1997 (the driest time of year) which showed the flows above and below the disturbed area to be exactly the same.

The overall view is that the culverted reach of stream is of very minor consequence when compared to the recharge mechanism for any springs that may issue from the Mancos shale downstream of the mine disturbed area. Similarly, the streamflow in Dugout Creek is not expected to suffer any significant impacts.

Ponds, Impoundments, Banks, Dams, and Embankments

- Plate 7-4 show the sediment pond design. The plan was certified by Richard White, a registered professional engineer.
- The applicant gave the Division certified maps, and cross section of the sediment pond. Plate 7-4 shows detailed information about the sediment pond.
- Plate 5-7 shows the areas where the applicant anticipate subsidence. On that plate the sediment pond is outside the area of potential subsidence.

Findings:

Operations hydrologic information provided in the proposed Phase II MRP is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-724, -728.100, Operational water-monitoring data obtained since the original PAP was prepared: these need to be included in the proposed amendment to the MRP and evaluated as part of the PHC determination.

R645-301-121.200, Clarify what appears to be a typo at the bottom of page 7-57: instead of "Table 7-4" (the ground-water monitoring parameters) it seems it should be "Table 7-5" (the surface-water monitoring parameters).

R645-301-731, For springs, Tech-004 recommends one water quality sample at low flow every fifth

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year, during either the year preceding re-permitting or at midterm review, to be analyzed for baseline parameters. For other ground-water quality monitoring sites, one sample anytime during the same year. There is no provision for this sampling and analysis in the operational ground-water monitoring plan.

R645-301-731, For surface water, Tech-004 recommends one water quality sample at low flow every fifth year, during either the year preceding re-permitting or at midterm review, to be analyzed for baseline parameters. There is no provision for this sampling and analysis in the operational surface-water monitoring plan.

R645-301-742.311, Provide culvert design information for the undesignated culvert at the downstream end of the disturbed area. The design must consider alignment with the energy dissipator and side drainage inflows.

R645-301-752.100, The undesignated culvert must have a description of how it will be dealt with at reclamation. Will it be removed or left? How does this fit into post-mining land use? Who is responsible for maintenance after reclamation if it is left?

R645-301-742.240, Redesign ASCA-1 and ASCA-2 to fit the site conditions and contemporaneously reclaim the areas that are no longer maintained.

R645-301-731.121, and 742.120, Removal of silt fences at the lower end of the disturbed area across Dugout Creek will be done only after completion of all construction. Straw bales will be installed according to the Best Technology Currently Available as provided in current design methods. Provide riprap erosion protection at the outlets of DC-8 and DC-9.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: R645-301-526.

Analysis:

Support Facilities

The applicant committed to construct, operate, maintain and reclaim all support facilities as required by the SMCRA and the Utah coal program.

Water Pollution Control Facilities

The applicant committed to construct, operate maintain and reclaim all water pollution control facilities as required by SMCRA and the Utah coal program.

Support Facilities

The applicant has met the minimum regulatory requirements.

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Water Pollution Control Facilities

Findings:

The applicant met the minimum requirements of R645-301-526 with regard to support facilities.

SIGNS AND MARKERS

Regulatory Reference: R645-301-521.

Analysis:

Mine and Permit Identification Signs

A mine and permit identification sign will be displayed at the point where the county road ends and the private road forks into the surface-facilities area. This sign will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area. The sign will contain the following information:

- Mine name,
- Company name,
- Company address and telephone number,
- MSHA identification number, and
- Permanent program permit identification number as obtained from the

Division.

The applicant committed to place the mine and permit identification signs at all entrances that are accessible from a public road.

Perimeter Markers

The perimeter of all areas affected by surface operations or facilities will be clearly marked before beginning mining activities. The markers will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area. Figure 5-2

Buffer Zone Markers

Stream buffer zone markers will be placed adjacent to Dugout Creek within the disturbed area noted on Plate 5-2. The buffer zones will be located at the upstream and downstream ends of the Dugout culverts. Each buffer zone marker will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area.

Topsoil Markers

Markers will be placed on all topsoil stockpiles. These markers will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area.

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Findings:

The applicant has met the minimum regulatory requirements.

USE OF EXPLOSIVES

Regulatory Reference: R645-301-524.

Analysis:

In Section 524 of the MRP the applicant states:

Mining and reclamation activities at the Dugout Canyon Mine may require the use of blasting or explosives on the surface during construction of the surface facilities. SMC will comply with all local, State, and Federal laws in the use of explosives during construction of the site and at any other times when blasting is required at the Dugout Canyon Mine. A certified blaster will direct all blasting operations with the help of at least one other person. SCM will ensure that all appropriate contractors working on any project at the site are made aware of proper blasting procedures. All blasting records will be kept on file at the mine for the required period of time.

All explosives containers used at the mine will be constructed to meet or exceed the requirements of the Mine Safety and Health Administration. The surface storage containers (one for caps and one for powder) will be placed in a location that will ensure the protection of the environment and personnel (see Plate 5-2). The containers, which will rest on skids, will be constructed of 1/4 to 1/2 inch steel plate with a lining of 1/2 inch plywood. Each storage container will be secured with a five tumbler padlock and will contain two vents measuring approximately 3 inches by 3 inches.

A small metal utility trailer will be used for transportation of explosives underground. This trailer will be lined with plywood, with separate compartments for caps and powder. No metal parts will be exposed to the caps or powder. All underground blasting activities at the mine will be conducted under the direction of a MSHA certified blaster.

The applicant does not know if or when surface blasting will be needed. They did notify the Division in Section 534 of the MRP that some blasting may occur. The Division realizes that the need for surface blasting can usually only be determined during construction. In such cases the Division will accept a general blasting plan and stipulate that prior to any surface blasting that the applicant obtain Division approval. The Division will approve Section 524 of the MRP with the stipulation that blasting will only occur after the Division has approved the blasting plan.

Findings:

R645-301-524, The Division should approve Section 534 of the MRP with the stipulation that prior to any surface blasting the applicant first has their blasting plan approved by the Division.

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MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Affected area maps.

The applicant has met the requirements of R645-301-521.141 by giving the Division with Plate 5-7 that clearly shows the boundaries of all areas proposed to be affected over the estimated total life of the coal mining and reclamation operations.

In Section 523 of the PAP the applicant states that they schedule mining to begin in 1998. The dates on Plate 5-7 show that the applicant hopes to mine from 1998 till 2020.

Not all the proposed mining areas are in the permit area. Before permitting the life-of-mine affected area the applicant wants to learn more about the mining conditions in the permit area. If mining conditions are favorable, the applicant will apply for expanding the permit boundary.

The Division understands the applicant cannot determine that mining condition until production begins. The applicant does not want to permit areas that may never be mined. Therefore, the Division agrees to process permit boundary expansion in the future.

Mining facilities maps.

Plate 5-2 shows the location of the proposed surface facilities. The Division considers this map adequate for describing the proposed surface structures.

Mine workings maps.

The applicant did not give the Division a detailed map of the proposed mine workings. The Division needs a detailed mine map similar to those required to MSHA. In Phase I the applicant committed to supply the Division with a detailed mine map but has not yet fulfilled that commitment. The applicant has not yet met the requirements of R645-301-521.141.

Monitoring and sample location maps.

Locations and approximate elevations of bore holes are shown on Plate 6-1. Collar elevations, some estimated from topographic maps, and elevations of cored sections are given in Appendix 6-1.

Elevations and locations of monitoring stations used to gather operational water quality and quantity data are on Plate 7-1.

There are no permanent wildlife monitoring sites. Habitat enhancement, the riparian area along Dugout Creek, is shown on reclamation maps.

No map of air quality monitoring sites has been required by UDOGM.

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Certification Requirements.

Cross sections, maps, and plans have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer.

Findings:

R645-301-521.141. The applicant did not provide the Division with detailed mine workings maps. The Division needs detailed mine workings maps similar to those required by MSHA.

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GENERAL REQUIREMENTS

Regulatory Reference: R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

The applicant did not have any general comments about the engineering requirements in the reclamation section of the TA. All engineering comments about the reclamation plan were given in other sections of the TA. All engineering topics of the reclamation plan were addressed by the applicant. Therefore, the Division considers the applicant's response to the general requirements adequate.

Findings:

The applicant has met the minimum regulatory requirements of this section.

POSTMINING LAND USES

Regulatory Reference: R645-301-412, -301-413, -301-414

Analysis:

The postmining land use will be livestock grazing and wildlife habitat. The plan says final reclamation activities, such as grading and seeding, will be completed in a manner to provide lands able to support the postmining land use. Many of the slopes are considered too steep for livestock grazing. In developing a grazing management plan for the Randolph unit, the Bureau of Land Management produced suitability tables based on slope percent and slope length. They found any slopes steeper than 50% (2h:1v) were unsuitable for grazing. Plates 5-3 and 5-4 show numerous cross sections where slopes are steeper than 50%. The applicant justifies the slope lengths and steepness by saying they are similar to the surrounding area. The Division recognizes the premining area has steep slopes; however, given the land use and the unstable condition of the area until vegetation establishment, steep slopes should be confined to upland areas and should not be in the riparian zone (riparian zone as defined in Plate 3-1A and subsequent Division field measurements).

Much of the disturbed area was previously mined and not reclaimed to the current standards. Using current definitions, previous mining activities can be classified as having disturbed or just affected the land. Exploration activities occurred on the site in the 1980's and then again in the 1990's. No topsoil was saved in initial development. However, adequate substitute material should be available to make up the difference as growth medium.

A road exists (prior to current mining) through the permit and disturbed areas. This road will remain for the postmining land use. The plan says the road has a width of 16 to 25 feet within the disturbed area. The reclaimed road will also have a width of about 16 feet.

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The Bureau of Land Management and State of Utah own the land in the disturbed area. Appendix 4-3 contains a letter from the State concurring with the postmining land use, but the plan need to contain comments from the Bureau of Land Management concerning the postmining land use.

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-412.200, The applicant needs to provide comments from the Bureau of Land Management concerning the postmining land use.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The site was disturbed before the passage of SMCRA. There are no detailed topographic maps of the pre-disturbed site. The applicant will not try to restore the site to the pre-mining topography. Instead the applicant plans the reclaimed site so it will blend into the surrounding area. The Division has determined that the topography of the reclaimed site will be similar to the surrounding area. Therefore, the reclamation plan meets the approximate original contour requirements of Section R645-301-531, R645-301-533, R645-301-536 and R645-301-542.

Findings:

The applicant met the minimum requirements of this section.

BACKFILLING AND GRADING

Regulatory Reference: R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

The engineering requirements for the backfilling and grading requirements of the reclamation plan are stated in R645-301-537, R645-301-552 and R645-301-553.

- R645-301-537 deals with regraded slopes that need special Division approval for alternative specification of if steep cut slopes are to be retained.

In Section 537 of the MRP the states:

No mining or reclamation activities will be conducted in the permit area that require approval of the Division for alternative specifications of for steep cut slopes due to the inability of SCM to meet the regulatory requirement of R645-537.100.

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R645-301-537.100 deals with steep cut slopes. Usually retained steep cut slopes are associated with road cuts. All roads in the disturbed area will either be retained or be fully reclaimed. The designs for all retained roads have been certified by a professional engineer to meet the performance standards. The Division has determined that the designs for the retained roads are adequate. No cut slopes will be associated with the reclaimed roads. The applicant did not request for that alternative specifications be used for steep cut slopes. Therefore, the Division has not granted any variances from standard backfilling and grading requirements due to the retention of steep cut slopes. The applicant has met the minimum requirements of this section.

R645-301-537.200 applies to settled and revegetated fill. Under certain condition settled and revegetated fills do not have to be regraded during reclamation to achieve AOC. The applicant states that they will grade all settled and revegetated fills at the site. The applicant has not applied for a waiver from the AOC requirements based on the settled and revegetated fills exemption. Therefore, the Division has not granted any variances from the standard backfilling and grading requirements due to settled and revegetated fill. The applicant has met the minimum requirements of R645-301-537.200.

- Section 552 deals with small depression and permanent impoundments.

R645-301-552 deals with permanent features such as small depression and permanent impoundments. The applicant will leave small depression to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation. No permanent impoundments will be left after reclamation. The Division encourages the applicant to leave small depression on the regrade slopes to aid in revegetation and slope stability. The applicant has met the minimum requirements of R645-301-552.

- In Section 553 of the MRP the applicant states that the backfilling and grading plan are presented in Section 542.200.

In Section 542.200 of the MRP the applicant states:

The Dugout Canyon regrading plan was designed to meet the objectives of balancing cut and fill quantities, maintaining a geotechnically stable base. The primary features of this plan are:

- Removal of the pad upon which surface activities will be constructed at the mine, thereby creating a slope, which will adequately drain while minimizing long-term erosion concerns
- Backfilling to remove highwalls within the objectives noted above (cut and fill balance, site stability, and erosion control)
- Construction of stable channels across regraded areas
- Placement of topsoil
- Revegetation and mulching of the topsoiled site
- Removal of the sedimentation pond (together with accompanying regrading, topsoil, revegetation, and mulching of the sedimentation pond area) and implementation of interim sediment-control measures

Plates 5-5 and 5-6 show the reclaimed surface and cross sections. The plates show that the pad area will be removed. The adequacy of the slopes to control erosion will be discussed in the hydrology section of the backfilling and grading plan.

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Preexisting highwalls exist at the site. In Section 553.100 the MRP the applicant states that the backfilling and grading plans have been designed to eliminate highwalls at the site. In Section 553.500 of the MRP the applicant restates his commitment to reclaim all preexisting highwalls. In Section 553.600 the applicant states that the reclamation plan has been designed to eliminate all preexisting highwalls.

In Section 553.600 the applicant states that if during reclamation field conditions show that all available materials are not sufficient to eliminate the existing highwalls without exceeding the performance criteria outlined in the MRP small section of highwalls may be retained. The applicant states that before any highwall retention the Division approval will be obtained. The Division realizes that field conditions may require the applicant to modify the approved reclamation plan. Should the applicant request to leave part of the preexisting highwalls during reclamation the Division will evaluate that request. The applicant met the minimum requirements of R645-301-553.120

The channel stability will be discussed in the hydrologic section of the backfilling and grading plan.

In Section 341.200 of the MRP the applicant discusses the distribution of topsoil and seedbed preparation. In subsection **Method Used for Planting and Seeding** the applicant states:

The area will be graded to final contours, then ripped to relieve compaction. Ripping will be completed to a maximum depth of 2 feet on approximately 4-foot centers. Final ripping depths will be determined by the soil materials being ripped, to prevent incorporation of less desirable soil/rock into productive soils.

Following ripping, topsoil (or substitute topsoil) will be applied to the ripped surface and left in a roughened state. Topsoil samples will be collected and sent to the laboratory for analysis to determine fertilizer requirements. The area will be broadcast fertilized with a recommended fertilizer using a hand held "cyclone-type" seeder in small areas or a rotary implement attached to the revegetation tractor in larger areas. All nutrients will be applied in a single application.

On slopes less steep than 2:1 a disc will be attached to the tractor, and used to incorporate the fertilizer into the soil. Seeding for grasses and forbs will be accomplished by drilling where possible, otherwise the seeds will be broadcast. All equipment used will be equipped with metering devices. Except as noted below all area will be fertilized and seeded the same.

Slopes 2:1 or steeper will not be ripped where slope degree or size of disturbed area is prohibitive. On steep slopes, the rough, fertilized disturbed surface will be treated by dozers tacking paralleling the contour or pocking by trackhoe to incorporate the fertilizer. Either technique is considered an acceptable preparation technique for steep slopes unaccessible to agricultural machinery. Tracking will be accomplished by traversing a dozer or trackhoe perpendicular to the slope contour. Broadcast seeding will be used on slopes greater then 3:1.

In Section 242.100 subsection **Soil Thickness** of the MRP the applicant states:

The topsoil will be distributed on all areas with slopes less than 2:1 that are to be reclaimed. During reclamation, the topsoil will be allowed to settle and attain equilibrium with its natural environment. This procedure will be followed for all areas in which facilities such as road beds, mine pads, and building site are to be abandoned.

Based on the results of the sampling and analysis of soil test pits TP-1, 4, 5, 6, 7, 8 and 9 and the description of pits 14 and 14A, approximately 28,455 CY of topsoil/growth media will be

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available to be distributed on reclaimed surfaces within the disturbed area boundary (Appendix 2-6). An estimated 14.7 acres within the disturbed area will receive topsoil. Based on the estimated quantity of available topsoil and the area to be covered, approximately 14.4 inches of topsoil will be placed in the reclaimed areas.

In Section 242.200 of the MRP the applicant states:

Since the mine area has been disturbed by previous mining activities, there are no private or public topographic maps which can be used to accurately determine the original geometric configuration of the canyon. Prior to topsoil redistribution, the disturbed area will be regraded to agree with final reclamation topography (Chapter 5).

On slopes less than 2:1, regraded land will be scarified by a ripper-equipped tractor or other appropriate equipment. The surface will be ripped to a maximum depth of 18 to 24 inches where possible to reduce surface compaction, provide a roughened surface to assure topsoil adherence, and promote root penetration.

In the area of Dugout Creek, the soils removed during culvert construction will be returned and placed along the slopes of the reclamation channel. Where dictated by the design of the reclamation channel, the soils will be placed within the interstitial spaces of the riprap to promote the establishment of riparian vegetation. The soils placed outside the riprap portion of the channel area will be reseeded with the appropriate seed mix following soil preparation and roughening.

The Division identified deficiencies with the backfilling and grading plan. Those deficiencies are as follows:

- The applicant states that topsoil will be placed on slopes no steeper than 2:1. Several slopes are as steep as 1.5:1. The applicant does not address how topsoil will be placed on slopes steeper than 2:1. Therefore, this section of the backfilling and regrading plan is deficient. The applicant must include plans and designs for placement of topsoil for slopes steeper than 2:1 (See R645-301-553.100)
- The applicant states that on slopes not steeper than 2:1 that the soil may be ripped on the contour. The Division is not aware of any ripping equipment that can safely rip on the contour on a slope steeper than 3:1. If the applicant wants to rip on the contour on steep slopes, he must identify equipment that can safely operate in those conditions. The Division finds the applicant's backfilling and grading plan deficiencies regarding ripping on steep slopes. The applicant must address how slopes greater than 3:1 will be ripped (See R645-301-533.100).
- The applicant states that a tractor with a disc will be used on slopes as steep as 2:1. The Division is not aware of any tractor that can be operated on a slope steeper to 3:1. The applicant must either identify equipment that can operate on a slope steeper than 3:1 or modify the backfilling and grading plan (See R645-301-533.100).

The placement of vegetation and mulch, and the interim sediment control measure will be discussed in other sections of the backfilling and grading section of the TA.

The Division reviewed the slope stability analysis in Appendix 5-4. The results of the applicant's slope stability analysis show that reclaimed slopes as steep as 1:1.5 is stable under all likely circumstances. The Division conducted a slope stability analysis based on the applicant's data and assumptions. The results of the

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Division's stability analysis were consistent with the applicant's analysis. However, the Division now questions some data and assumptions used in the stability analysis.

- The applicant does not include information about the imported soils in Appendix 5-4. That information must be included in the slope stability analysis.
- An assumption used in the stability analysis is that water pressure will not be a factor. In the spring of 1998 slides did occur in Dugout Canyon upstream of the mine site. Water may have played a factor in the slope failure. If water was a factor then the assumption that water pressure can be ignored is no longer valid. The applicant needs to address this issue.
- The applicant assumed that the maximum height of a reclaimed slope would be 30 feet. Some reclaimed slopes on Plate 5-6 are higher than 30 feet. The applicant must include analysis on slopes that are as high as the actual reclaimed slopes.

The applicant did not meet the requirements of R645-301-553.130 because they did not give the Division an adequate slope stability analysis on the reclaimed slopes.

In Section 542.700 subheading **Disposal of Coal Mine Waste** the applicant states that all coal mine waste generated at the Dugout Canyon Mine will be disposed of either underground or at the waste rock disposal sites at the SUFCO or Skyline Mines. Since Phase II was submitted, the Division did approve of disposing of 1,400 cubic yards of coal mine waste at the Dugout Canyon Mine. The applicant needs to state how the coal mine waste will be disposed of on the site.

Findings:

R645-301-553.100, Before approval the applicant must submit plans for placing topsoil on slopes steeper than 2:1, ripping slopes that are steeper than 3:1 and alternatives to using tractors on slopes steeper than 3:1.

R645-301-553.100, Before approval the applicant must submit a detailed slope stability analysis to the Division. The slope stability analysis must include the physical characteristic of the imported fill, give supporting evidence to the assumption that pore pressure will not be a factor in slope stability (the slope up the canyon failed during a high rainfall year) and stability analysis will be done on a slope similar to those that will be constructed during reclamation (an assumption in the stability analysis is that the maximum slope height will be 30 feet but some slopes shown on Plate 5-6 are higher than 30 feet).

R645-301-542.730, Before approval the applicant must submit a detailed plan for how coal mine waste that will be used for construction of the pad will be disposed.

MINE OPENINGS

Regulatory Reference: R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

A detailed description plan for sealing underground openings is given in Section 542.700 of the MRP.

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In Section 542.700 the applicant states:

All mine openings will be sealed at least 25 feet inside the mine opening. Prior to installation of the seal, all loose material will be removed from the roof, floor, and rib of the mine within 3 feet of the seal area. The seal will then be constructed using solid concrete blocks (average minimum compressive strength of 1,800 psi) with nominal dimensions of 6 inches high, 8 inches wide, and 16 inches long. Mortar will consist of one part cement, three parts sand, and no more than 7 gallons of water per sack of cement.

The seal will be recessed at least 16 inches deep into each rib and 12 inches deep into the floor. No recess will be made into the roof. In the bottom course, each block will be laid with its long axis parallel to the rib. The long axis in succeeding higher courses will be perpendicular to the long axis of the blocks in the preceding course. An interlaced pilaster will be constructed in the center.

The seals will have a thickness of approximately 16 inches. Following seal construction, the entries will be backfilled from the seal to the outside surface with soil that is sloped at the surface to match the final slope at the entry. The soil will then be raked and revegetated with the approved seed mixture.

Alternatively, a cast-in-place MSHA approved, seals will be installed with a minimum thickness of 3 feet and a minimum compressive strength of 200 psi.

Under R645-301-551 the applicant is required to seal and backfill all mine openings. The seals and backfilling requirements must be consistent with MSHA, 30 CFR 75.1771. The backfilling and seal plan meets those requirements.

Findings:

The applicant met the minimum regulatory requirements of this section.

TOPSOIL AND SUBSOIL

Regulatory Reference: R645-301-240.

Analysis:

Chapter 2, Soils, Sections 240 through 250, discusses the soil's reclamation plan for the proposed Dugout Canyon Mine. Appendix 2-6 provides information on topsoil volumes. Chapter 5, section 542.200, and Chapter 3, section 341.200, address slope stability and erosion control, respectively. Reclamation Topography is shown on Plate 5-5 and Reclamation Cross- Sections are shown on six sheets of Plates 5-6. This Analysis section discusses reclamation information as follows:

- Soil Redistribution
- Soil Nutrients and Amendments
- Soil Stabilization

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Soil Redistribution

Cut and fill calculations for the site are found on page 5-61 and Appendix 5-5. An estimated 99,630 CY are needed for fill and an estimated cut quantity is 97,575 CY. This leaves a difference of 2,055 C Y of fill.

Topsoil will be replaced on all areas with slopes less than 2:1 (page 2-38). Based on the 28,455 CY of salvaged soil (see Appendix 2-6) and 14.7 acres or 640,332 sq ft to receive topsoil, the average soil redistribution will be a depth of 14.4 inches as stated on page 2-39 of the MRP. However, the soils salvaged from the culvert expansion, 1,568 CY, were included in the soil redistribution depths, but should not have been, since these soils will be returned to the reclaimed channel area. This reduces the reclamation topsoil depth to 13.6 inches. ($26,887 \text{ CY} \times 27 \text{ CF/CY} = 725,949 \text{ CF}$. $725,949 \text{ CF} \times 640,332 \text{ SF} = 1.13 \text{ ft}$ or 13.6 inches.) If the underlying material is suitable, these soil depths will allow for the implementation of surface roughening reclamation techniques, such as deep pocking, or gouging of the soil surface without penetrating the subsurface fills. Should the additional 6,504 CY of topsoil substitute material become available during reclamation, the topsoil depth would increase to approximately 16 inches. If excess soil is available after channel reclamation, then these excess soils may be used elsewhere in the disturbance area.

Where dictated by the reclamation channel design, riparian soils (1,568 CY salvaged and stored separately) will be placed within the interstitial spaces of the riprap to promote riparian vegetation establishment. Soils placed outside the riprap areas will be reseeded following soil preparation and surface.

As noted in the backfilling and grading section of the engineering review within this Technical Analysis, all slopes should receive topsoil (R645-301-553.100). Any areas which will not receive topsoil should be identified on the Reclamation Topography Map, Plate 5-5.

Soil Nutrients and Amendments

Soil nutrients and amendments will be applied to the redistributed soils based on analyses of samples collected from the stockpiled topsoil.

Soil Stabilization

Soil stabilization practices include surface roughening techniques such as gouging and/or deep pocking, and "high-quality" erosion mat placement on slopes 2:1 or steeper (pages 2-28, 2-41, 3-40, 3-45, and 3-51). No calculations for the added cost of the erosion matting and installation were found in Appendix 5-6 Bond Calculations. The Division is unclear as to how the application of erosion control matting will occur over the gouged surface.

Soil may be replaced at grades of up to 1.5h:1v (page 5-70). The steepness of these slopes will be reduced at their base, providing a concave slope. Slopes which are 3h:1v or steeper will be gouged using a trackhoe (page 5-70).

Soil redistribution with the culvert expansion area will require placing soils on slopes greater than 2:1. According to the reclamation cross sections, these steep slopes exist throughout the reclaimed channel for Dugout Creek. Figure 3-1 shows a cross-section of the riprapped channel. The PAP does not discuss soil placement techniques on these steep slopes that drop directly into Dugout Creek.

The plan explains that any contaminated surface soil within the disturbed area will be removed and stored during final reclamation. Furthermore, the plan says that if the contaminated soils can not be

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rehabilitated, the contaminated material will be buried along with excess gravels, crushed stone, or other contaminants.

Soil stabilization techniques after topsoil is placed on steep slopes greater than 2:1 are needed, especially within the stream corridor where the culvert will be removed. Specific techniques should be stated in accordance with slope steepness to ensure that soil will remain intact on the steep slopes while vegetation is being established.

Findings:

The applicant must provide the following, prior to approval, in accordance with the requirements of:

R645-301-242, The soils salvaged from the culvert expansion, 1,568 CY, were included in the soil redistribution depths in Appendix 2-6, but should not have been, since these soils will be returned to the reclaimed channel area. This reduces the reclamation topsoil depth to 13.6 inches. Appendix 2-6 should be modified to reflect the segregation and selective replacement of the riparian area soils.

R645-301-233, Specific locations of erosion control matting use should be identified in the MRP and calculated into the bonding. Other possible soil stabilization techniques for slopes greater than 2:1 should be stated, should erosion control matting be eliminated from the plan.

R645-301-240, The MRP should be revised to indicate that all slopes will receive topsoil. Slopes which will not receive topsoil should be identified on the Reclamation Topography Map, Plate 5-5.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

All roads in the disturbed area will be retained as part of the Postmining land use or fully reclaimed. Dirt roads outside the disturbed area will only be used for access to monitoring and data collection sites. The Division determined that since the dirt roads outside the disturbed area existed before the permit was issued and that mining activities will have a small impact that the dirt roads outside the disturbed area do not need to be reclaimed. The only paved road outside the disturbed area is a county road. The Division does not permit public roads. Therefore, the Division will not require the County or applicant to reclaim the county road.

The dirt road in the disturbed area will be reclaimed. No cut slopes from the dirt road will be left.

The main haul road will be modified and left as part of the postmining land use. The Division determined that the road was needed to support the postmining land use and that the designs for the road are adequate. Therefore, the applicant met all the requirements of this section.

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Findings:

The applicant met the minimum requirements of this section.

HYDROLOGIC INFORMATION

Regulatory Reference: R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Ground-water monitoring.

Wells GW-10-2, GW-11-2, and GW-24-1 (all completed in the Castle Gate Sandstone) and springs SP-45 (Colton Formation), SP-2 Flagstaff Formation), SC-14 North Horn Formation), and SC-80 (Castle Gate Sandstone) will be used to monitor ground water conditions in the proposed Dugout Canyon Mine permit area. Locations of wells and springs to be monitored are on Plate 7-1. See the discussion of Ground Water Information under Baseline Information in the Environmental Resource Information section.

Data will be collected under the groundwater monitoring program every year until 2 years following the completion of surface reclamation activities. During the post-mining period, water levels will be collected from the monitoring wells and data/samples will be collected from the identified springs once each year during September or October (i.e., the low-flow season while the sites are still accessible). Groundwater monitoring during the post-mining period will continue until bond release (p. 7-56). Exploration or monitoring wells are planned to be sealed before final release of bond, but if ownership is transferred Canyon Fuel Company will remain responsible for the management of the wells until bond release (pp. 7-59 and 7-60).

The schedule for reclamation ground-water monitoring, in particular the time at which ground-water monitoring will end, is unclear. Monitoring until 2 years following the completion of surface reclamation activities will not coincide with bond release. The Utah Coal Mining Rules call for monitoring up until bond release; however, UDOGM can modify the monitoring requirements, including the parameters covered and the sampling frequency, if specific conditions are met by the mine operator. The MRP contains no information to support the ending of ground-water monitoring 2 years following the completion of surface reclamation activities.

Surface-water monitoring.

Data will be collected from the sedimentation pond discharge point in accordance with the UPDES permit. Data will be collected under the surface water monitoring program every year until bond release (p. 7-59). Locations of surface-water monitoring sites are on Plate 7-1.

Acid and toxic-forming materials.

Numerous places in the text describe how there are no acid- or toxic-forming materials at this site. Included are Chapter 6, Geology, Chapter 5, Engineering, and Chapter 7, Hydrology. It appears this is not a problem at this site.

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Transfer of wells.

Before final release of bond, exploration or monitoring wells will be sealed in a safe and environmentally sound manner. Ownership of wells will be transferred only with prior approval of the Division, and conditions of such a transfer will comply with State and local laws. Canyon Fuel Company will remain responsible for the management of transferred wells until bond release (pp. 7-59 and 7-60).

Discharges into an underground mine.

No discharges of surface water will be made to an underground mine in the permit and adjacent areas (p. 7-60).

Gravity discharges.

No gravity discharges will be made from an underground mine in the permit and adjacent areas (p. 7-60).

Water quality standards and effluent limitations.

Discharges of water from disturbed areas will be in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining contained in 40 CFR Part 434 (p. 7-90).

Diversions.

All corrugated metal culverts are removed during reclamation and the canyon is restored to its approximate original contour. The stream reclamation plan is covered on pages 7-92 through 7-100, and in Appendix 7-11. The basic plan is to line Dugout Creek and its main eastern tributary reclamation channels with riprap to form a stable "macrochannel". The required 100-year, 6-hour design event was used to size the channels. The channels are eight feet wide and three feet deep resulting in 1.9 feet of freeboard. The riprap is two feet thick with filter blankets sized to the underlying soil. Filter design will be finalized at reclamation to base the design on soils present at that time since there will be a mixture of soils during reclamation. Estimated riprap and filter quantities are contained in the appendix.

In addition, there will be a series of 29 "Channel Stability Enhancement Structures", to provide a "microchannel" environment to increase sediment deposition above the macrochannel. These are shown in Fig. 7-12 and are spaced about every 60 feet along the channel. Three types are employed: Low-Stage Check Dams, Bank-Placed Boulders, and Rock or Log Spurs. The overall impact of the stream reclamation will be to provide a channel that is significantly improved over that which was left by pre-SMCRA mining and a channel that will promote riparian revegetation. It should be noted that no fish have been found in Dugout Creek.

Page 3-21 describes a mitigation plan whereby about 7,500 feet of streambank above the mine disturbed area is reseeded and vegetation is planted in the stream. This is consistent with the typical 3:1 mitigation for such projects and will result in immediate and long-term benefit to the stream.

The second phase of the plan extends the length of Dugout Creek to be reclaimed and includes additional side channels, but the methods remain the same.

Plate 7-5, and some of the other plates, show a culvert at the extreme lower end of the disturbed area. This culvert is not designated and no design information could be found. Since it is inside the disturbed area, it is part of the MRP and must have design information provided. The design needs to include the inlet and outlet

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design to minimize erosion. It will probably be necessary to provide an energy dissipator or riprap at the culvert outlet to prevent erosion.

This situation is unique in that this culvert is directly and immediately downstream of the energy dissipator at the outlet of the main culvert under the disturbed area. In addition, there is a substantial side drainage entering Dugout Creek at the inlet to the undesignated culvert. Further, the stream bends and the flow exiting the energy dissipator does not run straight into the culvert. There is potential for high flows to seriously damage the road at the upstream inlet to the undesignated culvert. Consideration should be given to reorienting the energy dissipator, or the undesignated culvert, or both, to better align them and provide a smooth flow between them and still allow for the side drainage.

The county road ending in this area is not relevant to this issue since it is all contained within the disturbed area.

Stream buffer zones.

No information could be found in the plan regarding stream buffer zones being established and adhered to during reclamation.

Sediment control measures.

The sediment control measures during reclamation include silt fences and straw bales, which are considered adequate when used as described. Removal of the sediment pond is primarily filling in an excavation. However, since reclamation will be every bit as large a project as the construction of the site, it would be expected that similar sediment control measures would be employed. Specifically, the minimum of four silt fences at the lower end of the site need to be used.

Siltation structures.

The only siltation structure is the sediment pond, which is described in the next section.

Sedimentation ponds.

R645-301-542.400 and R645-301-542.500 state the requirements for sediment pond reclamation. Under the requirements in R645-301-542.400 the applicant is required to remove all temporary sediment structures and ensure that all permanent structures are in good working condition. Under the requirements of R645-301-542.500 the applicant is required to supply a timetable for the removal of each sediment pond.

In Phase II the applicant plans to replace the Phase I sediment pond with the Phase II sediment pond. The Division considers the removal of the Phase I sediment pond as part of the operation plan rather than the reclamation plan.

Figure 5-3, Reclamation Timetable, shows that the sediment ponds will be removed after most of the reclamation activities have been completed. Most of the reclamation work that will be done after the sediment ponds have been reclaimed involve reclaiming the sediment ponds themselves.

Other treatment facilities.

There are no other treatment facilities at the mine.

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Exemptions for siltation structures.

This does not apply to this project.

Discharge structures.

The applicant does not propose to have surface waters discharge into underground mine openings. The backfilling and grading plans do not show water flowing into the mine openings. The applicant met the requirements of this section.

Impoundments.

The only impoundment at the Dugout mine is the sediment pond. See the section on sediment ponds.

Casing and sealing of wells.

In Section 551 of the MRP the applicant states that all monitoring wells will be sealed when no longer needed. Sealing of the wells will occur according to the requirements of the Utah Division of Water Rights. The Division determined that the well sealing plan is adequate.

When no longer needed for monitoring or other use approved by the Division and upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well, each well will be capped, sealed, backfilled, or otherwise properly managed as required by the Division. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters (p. 7-101).

Findings:

Reclamation hydrologic information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval, the applicant must provide the following information:

R645-301-121.200, -731.214, Clarification of when reclamation ground-water monitoring will end; monitoring until 2 years following the completion of surface reclamation activities will not coincide with bond release.

R645-301-752.100, The undesignated culvert must have a description of how it will be dealt with at reclamation. Will it be removed or left? How does this fit into post-mining land use? Who is responsible for maintenance after reclamation if it is left?

R645-301-600, Provide a description of the stream buffer zones to be established and maintained during reclamation.

R645-301-732, Provide the same level of interim sediment control during reclamation as was used during construction, namely a minimum of four silt fences at the lower end of the site.

REVEGETATION

Regulatory Reference: R645-301-341, R645-301-342

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Analysis:

Timing

A reclamation timetable is in Figure 5-4. Seeding and planting would be done in late August through late October with some seeding and planting done the following spring or fall if the planting window was to close before planting was completed. Traditionally, seeding is done in the fall with planting done in the spring. However, recent experience at another mine has shown that transplanting in the fall can be very successful.

Soil Stabilizing Practices, Seeding, and Mulching

Areas being reclaimed will be graded to final contours then ripped to a maximum depth of two feet on approximately four-foot centers. The plan needs to specify the minimum ripping depth for the Division to be able to determine it to be adequate.

Next, topsoil will be spread and left in a roughened state, and fertilizer will be applied. Slopes less steep than 2v:1h will then be disced to incorporate the fertilizer. Discing would almost completely eliminate the surface roughness and is not desirable, even to incorporate the fertilizer.

Slopes steeper than 2h:1v will not be ripped where ripping is prohibited by the size of the area of by the slope angle. These slopes will be treated either by dozer tracking parallel to the contour or by gouging with a trackhoe. Section 553.100 says all slopes steeper than 3h:1v will be gouged with a trackhoe. This contradicts the plan to use dozer tracking, and dozer tracking is not acceptable. It leads to smooth slopes where rill and gully erosional features are likely to develop. The plan to use dozer tracking needs to be eliminated.

The plan contains two seed mixtures, one for riparian areas and the other for all other areas. With this revision, the seed mixes have been changed in accordance with requirements in condition 20 of the March 16, 1998, permit. Every species in these mixtures is native to Utah, and they should provide vegetation that meets the performance standards, including the requirement that they have value for wildlife.

The plan says seed mix 1 will be used on the area above the mine site which has been logged and designated to be planted as a mitigation project; however, Section 322.200, page 3-21, contains a seed mix to be used in this same area. The applicant needs to clarify which seed mix would be used in the mitigation area.

Grass and forb seeds will be drilled where possible; otherwise, the seed will be broadcast. All slopes steeper than 3h:1v will be broadcast seeded. Although both drilling and broadcast seeding are acceptable, the Division has seen very good results with carefully controlled broadcast seeding and recommends this method. Drilling tends to reduce surface roughness.

Methods for establishing vegetation in the riparian areas are discussed in the "Riparian Restoration and Planting" section below.

Following seeding, disturbed areas will be mulched with a Division-approved mulching material. For bonding calculations, wood mulch applied at the rate of 2000 pounds per acre was assumed. On slopes steeper than 3h:1v, high quality erosion control matting will be used to anchor the mulch. This fulfills the requirement of condition 24 of the March 16, 1998, permit.

It is assumed "wood mulch" is wood fiber mulch rather than another material, such as sawdust or bark. Wood fiber mulch is generally more expensive to apply than some other mulches, so using this for bonding

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calculations is acceptable. However, before actually applying mulch, the applicant will need to have the specific mulch approved by the Division. It is expected mulch will be applied for interim revegetation seedings as early as the fall of 1998.

Under "Irrigation, Pest and Disease Control," the plan says no irrigation is planned and pesticides will not be used unless previously approved by the Division. In the discussion on riparian area planting, it says an irrigation program will be considered if the cottonwoods are planted as transplants. The topsoil storage area at the Soldier Canyon Mine will be treated to attempt to control cheatgrass.

Riparian Restoration and Planting

The applicant plans to restore Dugout Creek using a concept of macro- and micro-channels. The macro-channel will be a riprapped ($D_{50} = 12"$) channel 8 to 12 feet wide. The micro-channel within the macro-channel is approximately 3 feet wide and 1 foot deep. The micro-channel will be developed by establishment of 3 types of in-stream structures spaced about every 60 feet. The structures are thought to trap sediment which in turn will allow vegetation establishment. These structures are low stage check dams, bank-placed boulders, and rock or log spurs. Figure 7-12 shows typical drawings of these structures, and Plate 7-9 illustrates where they will be placed. This satisfies the requirements of condition 17 of the March 16, 1998, permit.

Stream banks will be seeded with the Final Reclamation Seed Mix #2 (Section 341.200). Trees and shrubs will be planted as specified in the mixture. According to specifications in the plan, the following plantings should occur:

- Narrowleaf cottonwoods and Rocky Mountain maples will be planted on the top of the bank at the rate of approximately 500 per acre. This will provide an 8 foot distance between individuals that will be 2 deep (wide).
- Willows will be planted at the rate of 1000 per acre. Assuming the area in which they would be planted is about five feet wide on each side of the stream, this would equate to a spacing of about one cutting every nine feet. This is not adequate. Maximum spacing in suitable areas is two feet between plants. The applicant needs to commit to this type of spacing which is about 4000 per acre. Realizing that the entire area next to the stream may not have areas suited for planting, the applicant may qualify the commitment.
- Sedge and horsetail plugs will be planted at the rate of 1000 per acre. Species of sedges to be used will need to be determined based on availability and what species are present in the area.
- The mid- to upper bank zone will be planted at a rate of 2250 plants per acre which is the equivalent of 4.4-foot spacings. Species to be used include woods rose, currant, snowberry, elderberry, and serviceberry. The width of this zone varies widely through the length of disturbance.

These planting densities are recommended by the NRCS. Figure 3-1 illustrates the various planting zones within the riparian area, top of channel, reclaimed slope, and top of riprap. This figure has been modified in accordance with the requirement of condition 18 of the March 16, 1998, permit. Because of the use of in-stream structures, most plantings will need to be done in clumps in the most favorable locations along the reclaimed channel rather than at specific intervals along the full length. Nevertheless, it will be necessary to have some plantings even away from the structures.

The plan does not say specifically what type of plant material will be used to establish cottonwoods, but

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either seedlings or pole plantings could be used. Seedlings should be large enough that they would have an influence on the riparian area after ten years. If poles are used, the applicant commits to have them be long enough to reach the water table and at least 1-3 inches in diameter. While the level of the water table is not known, the applicant commits to drill periodic holes to find this level so the poles can be planted deeply enough. These commitments satisfy the requirements of condition 19 of the March 16, 1998, permit. Enough of the poles should be left above ground so they will be above the surrounding vegetation. Two to twelve year old wood (non-furrowed, smooth bark) is best. The most important factor is to place the pole eight to ten inches below the summer (lowest) water table.

In the designs provided in the application, the applicant has adequately responded to condition 15 of the March 16, 1998, permit.

Success Standards

Revegetation success standards are discussed primarily in Section 356. The cover standards are based on range site baseline sampling done in 1997. They are 66% and 85% cover for the pinyon/juniper and riparian areas, respectively. Raw data and statistical information are in Appendix 3-1.

The woody plant density standard is 2200 stems per acre for both communities. This is a technical standard based on baseline information and professional experience.

The applicant has included range site descriptions for Upland Very Steep Shallow Loam (pinyon/Utah juniper), Semiwet Streambank (narrowleaf cottonwood), and Wet Saline Streambank (coyote willow) range sites. The descriptions of soils, slopes, vegetation, and precipitation for the Upland Very Steep Shallow Loam site appear to match the pinyon/juniper areas of Dugout Canyon fairly well.

The Wet Saline Streambank range site definitely does not apply to the Dugout Canyon riparian area. In this range site description, slopes are mostly 0-2% with elevations from 4600 to 4900 feet. The Dugout Creek stream gradient is about 5%, and the elevation is about 7000 feet. Other aspects of the description do not match.

The Semiwet Streambank range site more closely describes the Dugout Creek riparian area, but it is not a precise match, either. The slope in the range site description is 0-4%, the elevation is 4700 to 6400 feet, and the precipitation is 5-12 inches. Also, the range site description mentions a braided stream channel which does not occur in the stretch of Dugout Creek in the disturbed area. Some of the dominant species in the range site description, such as alkali sacaton, basin big sage, squawbush, and Baltic rush, are either not present or are present in relatively low numbers rather than being dominant.

The applicant needs to find a range site description that more closely matches the riparian area in Dugout Canyon. This can be used to compare to the data for the premining conditions and for a range site that could be used for revegetation comparison, such as in Fish Creek Canyon.

The plan indicates the productivity estimates given by the NRCS would be used as success standards. These values are 800 and 1500 pounds per acre for the pinyon/juniper and riparian areas. The applicant commits to sample productivity at corresponding range sites if the NRCS production estimates are insufficient to satisfy regulatory requirements.

According to the plan, range sites for reclamation comparison will be chosen and designated the first year of reclamation activity. The designated range sites would be used as reference areas until final revegetation bond release has been issued.

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The Division's Vegetation Information Guidelines only approve the NRCS productivity estimation as a success standard when using the reference area method after the reference area is approved based on statistical cover similarity to the proposed disturbed area. The applicant needs to select range sites for comparison of productivity to reclaimed areas now rather than waiting until the time of reclamation. The range sites to be used for productivity comparisons need to have at least as much vegetation cover as the areas to be disturbed.

The "MRP Attachment A Response," received June 3, 1998, separately from the Phase II revision, contains a map designated Plate 3-1D showing the Fish Creek Range Site area. This range site was chosen in a joint visit by the Division, the applicant, and the applicant's consultant, but it needs to be sampled for cover and compared to the riparian area to be disturbed in Dugout Canyon before it can be approved. Also, the applicant would need to officially propose an amendment to the mining and reclamation plan.

The diversity standard will be a technical standard. The success standard for both the pinyon/juniper and riparian areas is that there will be two tree and shrub species, three grasses, and two forbs each with at least five percent cover. It is unknown how the success standard was selected, but with the other success standards, it should ensure a community that meets regulatory requirements for diversity. However, achieving this standard may be difficult.

The applicant has chosen to not apply the revegetation success standard in R645-301-356.250. Parts of the area to be disturbed have been previously disturbed, others have only been affected, and some are undisturbed. It would be difficult to apply the different standards over the relatively small disturbed area.

Condition 23 of the March 16, 1998, permit requires the applicant to either revise Plate 5-2C or to remove a statement about the applicability of R645-200 to certain parts of the disturbed area. The statement has been removed and the plate renumbered as Plate 5-4.

Fish and Wildlife Habitat

The reclamation plan, including species selection, meets the requirements of R645-301-342.

Findings:

Information provided in the plan does not meet the minimum requirements of this section. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-341, The applicant has committed to rip regraded areas to a maximum of two feet deep, but the plan needs to show a minimum ripping depth or other method of relieving compaction.

R645-301-341, Section 553.100 says all slopes steeper than 3h:1v will be gouged with a trackhoe, but Chapter 3 indicates some slopes may be treated with dozer tracking. This contradiction needs to be eliminated. Dozer tracking is not an acceptable treatment since it is likely to lead to smooth, steep slopes where rill and gully erosional features will develop. This is a requirement of condition 21 of the March 16, 1998, permit.

R645-301-341.210, The applicant needs to clarify which seed mix will be used in the mitigation area above the mine site.

R645-301-341.210, The number of willows to be planted in the riparian area needs to be increased to about 4000 per acre. Because the entire area may not be suited for planting willows, the applicant may need to qualify the commitment based on appropriate planting areas. This

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requirement is part of condition 16 of the March 16, 1998, permit.

R645-301-356, The applicant needs to either sample the pinyon/juniper and riparian areas in accordance with the Vegetation Information Guidelines requirements for final bond release or commit to selecting range site reference areas with cover at least as great as found in the disturbed area.

In addition, the plan says certain areas will be disced to incorporated fertilizer. Discing will probably reduce surface roughness and is highly discouraged. The Division also recommends broadcast seeding all areas since drill seeding tends to reduce surface roughness.

The plan will need to show what type of mulch will be used prior to the mulch being applied. Interim revegetation seeding and mulching could occur in the fall of 1998.

CESSATION OF OPERATIONS

Regulatory Reference: R645-301-515, -301-541.

Analysis:

In Section 515.300 the applicant discusses temporary cessation. In that section the applicant commits to follow the requirements of R645-301-515.300. The Division considers the commitment adequate to meet the minimum regulatory requirements.

Findings:

The applicant met the minimum regulatory requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Reclamation monitoring and sampling location maps.

Elevations and locations of monitoring stations used to gather reclamation water quality and quantity data are on Plate 7-1.

Certification Requirements.

Cross sections, maps, and plans have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer.

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Affected area boundary maps.

The affected area boundaries are similar to the disturbed area boundaries and the subsidence area boundaries. See Section R645-100-200 for the definition of the affected area. Plate 5-7 shows the anticipated subsidence area boundaries. Since the extent of subsidence will not be known until mine has been completed and the only reclamation requirements in the subsidence area are to mitigate unforeseen subsidence damages the Division considers the Plate 5-7 adequate.

Plate 5-5 and Plate 5-6 show the disturbed area boundaries. Some disturbed areas shown in Phase I was not included in Phase II. All disturbed areas in Phase I must be included in the Phase II disturbed area boundaries. **The applicant did not correctly identify disturbed area boundaries as required by R645-301-542.310.**

Bonded area map.

The bonded area maps identify the initial and successive areas or increments for bonding. These maps were intended for surface mines where mining and reclamation are conducted concurrent. Underground mines usually reclaim all disturbed areas at the same time. The applicant's reclamation plan shows that all disturbed areas will be reclaimed at the same time. Therefore the Division does not need a map that shows when each area will be reclaimed. Plates 5-5 and Plate 5-6 show the reclaimed surfaces and are considered adequate bond area maps by the Division.

Reclamation backfilling and grading maps.

Plates 5-5 and Plate 5-6 show the backfilling and grading plans. The Division considers these maps adequate.

Reclamation facilities maps.

Plates 5-5 show the facilities that will be left after reclamation. The Division considers that maps adequate.

Final surface configuration maps.

Plates 5-5 and Plate 5-6 show the final surface configuration. The Division considers those maps adequate.

Reclamation monitoring and sampling location maps.

Elevations and locations of monitoring stations used to gather reclamation water quality and quantity data are on Plate 7-1.

There are no permanent wildlife monitoring sites. Habitat enhancement, the riparian area along Dugout Creek, is shown on reclamation maps.

No map of air quality monitoring sites has been required by UDOGM.

Reclamation surface and subsurface manmade features maps.

These maps should show the location of all buildings in and within 1,000 feet of the proposed permit

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area, with identification of the current or proposed use of the buildings at the time of final reclamation. The location of surface and subsurface manmade features within, passing through, or passing over the proposed permit area. The location of each public road located in or within 100 feet of the proposed permit area and all roads within the permit area that are to be left as part of the post-mining land use.

There are no buildings or other structures within 1,000 feet of the permit area except for roads. The Division does not need a map that shows the reclamation permit boundaries and all lands within 1,000 feet of the permit boundaries. The Division considers the maps of the reclaimed disturbed area adequate for this section.

Reclamation treatments maps.

Figure 7-12 and Plate 7-9 show details of structures to be used in the stream to enhance or restore riparian habitat. A 7500-foot section of riparian area upstream from the mine will be enhanced as mitigation, but no other wildlife enhancement or monitoring features are planned. Text descriptions of other reclamation treatments, such as seeding and mulching, are considered adequate.

Certification Requirements.

Cross sections, maps, and plans have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer.

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

R645-301-542.310, The applicant must include all disturbed areas in Phase I in the Phase II disturbed area. The maps must be revised to show the correct disturbed area boundaries.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: R645-301-800, et seq.

Analysis:

Form of bond. (Reclamation Agreement)

The bond cannot be posted until the Division determines the amount.

Determination of bond amount.

R645-301-830.100 states that the performance bond will be in an amount determined by the Division. The Division cannot determine the bond amount until the reclamation plan is approved. Since the reclamation plan has not been approved (the backfilling and grading plan has not been approved) the Division cannot finalize the bond calculations. After the Division approves the reclamation plan but before the Division issues final approve, the Division will calculate the bond amount.

RECLAMATION PLAN

R645-301-830.140 states that the bond estimate is based on a detailed cost estimate provided by the applicant. The detailed cost estimate is based in part on the backfilling and grading plan. Since the backfilling and grading plan is deficient so if the reclamation cost estimate. The applicant failed to meet the requirements of R645-301-840.140 because they did not give the Division detailed plans for earthwork calculations.

Terms and conditions for liability insurance.

The applicant has a permit to operate the Dugout Mine. As part of the permit conditions the applicant must have adequate insurance. The insurance requirements will not change if Phase II is approved. Therefore, the Division has determined that the applicant has adequate insurance.

Findings:

The Division will evaluate the reclamation agreement after the bond amount is determined. The applicant did not meet the requirements of R645-301-830.140. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-830.140, The applicant needs to give the Division a detailed reclamation cost estimate. Part of the detailed reclamation cost estimate is the backfilling and grading plan. Since the backfilling and grading plan is inadequate the Division cannot determine the earthwork costs. Therefore, the reclamation cost estimate is inadequate.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: R645-301-730.

UDOGM has provided an assessment of the probable cumulative hydrologic impacts (CHIA) of the Dugout Mine operation and all anticipated mining upon surface- and ground-water systems in the cumulative impact area. It has been determined that the Dugout Mine operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The proposed Phase II operation has been reviewed by the Division and it has been determined by the Division that a new or updated CHIA is not required. The permitted area will remain within the boundaries of the existing CIA, and there will be no mining operations in hydrologic basins other than those approved in the current permit. There is no need for additional cumulative impact area information.