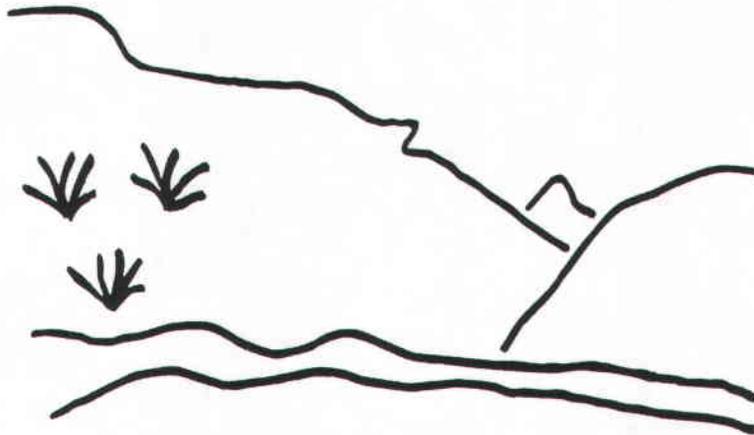


# State of Utah



## Utah Oil Gas and Mining

### Coal Regulatory Program

Bear Canyon Mine  
Wild Horse Ridge Revision  
C/015/025SR98(1)-4  
Technical Analysis  
April 16, 2001

File in:

- Confidential
- Shelf
- Expandable

Refer to Record No. 0009 Date 04/17/2001  
In C/015/025 SR98(1)-4, Outgoing  
For additional information



State of Utah  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

**COPY**

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April 17, 2001

Wendell Owen, Mine Manager  
Co-Op Mining Company  
P.O. Box 1245  
Huntington, Utah 84528

Re: Findings for Wild Horse Ridge Revision, Co-Op Mining Company, Bear Canyon Mine,  
[REDACTED] SR98(1)-4, O [REDACTED]

Dear Mr. Owen:

The above-referenced amendment has been reviewed and there are deficiencies that must be adequately addressed prior to approval. A copy of our Technical Analysis is enclosed for your information. In order for us to continue to process your application, please respond to these deficiencies by May 10, 2001.

If you have any questions, please call me at (801) 538-5325 or Paul Baker at (801) 538-5261.

Sincerely,

Daron R. Haddock  
Permit Supervisor

sm

Enclosure:

cc: Price Field Office

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**INTRODUCTION**

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**TECHNICAL ANALYSIS****INTRODUCTION**

The proposed Wild Horse Ridge significant revision amendment to the Bear Canyon Mine MRP was received by the Division on December 18, 1998. This significant revision is for the addition of Federal Leases U-020668 and U-38727 and fee coal. The proposed leases are east of the Bear Canyon Fault and the proposal includes new surface facilities in the Bear Canyon Right Fork. The Division determined the amendment to be Administratively Complete on November 3, 1999. The first technical review completed on January 24, 2000, found the amendment deficient. The package was resubmitted on May 8, 2000, and the Division sent its technical analysis July 28, 2000. After several extensions, the applicant responded with the most recent submittal on January 24, 2001. Additional information was received in March 2000.

The Division has received concurrence letters from the State Historic Preservation Office and the Fish and Wildlife Service. The Forest Service manages much of the surface within the proposed addition to the permit area, and they have not yet concurred. Some of the supplemental information received in March is intended to satisfy the Forest Service concerns.

**SUMMARY OF OUTSTANDING DEFICIENCIES**

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

- R645-301-121.200**, The applicant must clearly state how many acres are in the permit area. The phrase "lease and permit area" is confusing, since the lease and permit boundaries are not always identical. .... 10
- R645-301-121.200**, The applicant must label the hunting cabin and access road on Plate 3-7G and Plate 3-2G. .... 29
- R645-301-231 and R645-301-120**, Please correct the narrative on page 8-41 (which indicates that a total of 8,539 cubic yards of topsoil will be recovered) to agree with Table 3O-1 which itemizes 8, 700 cubic yards of topsoil. .... 42
- R645-301-333**, Use of the raptor nests near the proposed surface facilities will probably be adversely affected during the operations. The applicant has agreed to submit a proposal for a prey base study as mitigation for this loss. Once approved the applicant needs to implement the mitigation plan. .... 37
- R645-301-521.132, R645-301-521.163 and R645-301-521.190**, The applicant must give the Division a copy of the permit boundary map, Plate 2-1, in an AutoCAD file. The AutoCAD map must also include 1) the permit boundaries, 2) the permitted acreage, 3) the changes to the permit boundaries including the approximate dates when changes were made, 4) the disturbed area boundaries, 5) the disturbed acreage and 6) the changes to the disturbed boundaries including the approximate dates when changes were made. .... 11
- R645-301-521.132**, The permit boundary on Plate 2-1 does not match the description on Section 2.2.2. The permit boundary in Section 26 in the SW1/4 NW1/4 appears to be 200 feet short on the map. .... 11

**SUMMARY OF OUTSTANDING DEFICIENCIES**

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**R645-301-521.190**, On Plate 2-4G the applicant must show the contours extending 100 feet beyond the disturbed area boundaries. See the area by Sediment Pond D. . . . . 29

**R645-301-521.190, R645-301-542.300 and R645-301-553.120**, The applicant must give the Division a cross section for all highwalls that show the premining, operational, and postmining topography and the highwall boundaries. . . . . 58

**R645-301-521.190**, The applicant must state the before and after acreage in the MRP and on Plate 2-1. Information in the MRP must include a description of the acreage added (Township, Range and Section), the number of acres, the project name (Wild Horse Ridge) and the approximate date the change was made. . . . . 10

**R645-301-526.210**, The applicant needs to list all structures that are to be built as part of the Wild Horse Ridge project including the portal fan, the coal storage bin, power lines, and water lines. . . . . 52

**R645-301-528.323.1**, The applicant must address how burning and burned waste material will be handled. Note: R645-301-528.323.1 does not make exceptions for temporary storage piles. . . . . 46

**R645-301-536 and R645-301-521.190**, The applicant must state in the MRP the maximum amount of coal mine waste that will be stored in the temporary waste site at any given time, must develop a plan to have the material tested for acid and toxic properties before the coal mine waste is shipped to the Hiawatha Mine, and must develop a sediment containment plan for the material. . . . . 47

**R645-301-536.510**, Before the Division can allow coal mine waste to be shipped to the Hiawatha mine site the MRP for the Hiawatha mine site must be modified to allow coal mine waste from Bear Canyon to be sent to the Hiawatha mine. . . . . 47

**R645-301-542.200**, The applicant must give the Division detailed maps that show how the backfilling and grading requirements will be met. The specific items missing from maps and cross sections are the location of the highwalls, cut slopes and coal seams. . . . . 67

**R645-301-553.300**, The applicant must show that Pond D will be stable under rapid drawdown conditions. Note: Failure during rapid drawdown occurs when pore pressure in the embankment is not countered by the water, not erosion. The Division has a computer program that they will let the applicant have access to that calculates safety factors for rapid drawdown conditions. . . . . 52

**R645-301-742.312.4**, An approved Stream Alteration Permit obtained from the State Division of Water Rights for the proposed several stream channel alterations will need to be provided when it is received. . . . . 52

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**GENERAL CONTENTS**

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## **GENERAL CONTENTS**

### **IDENTIFICATION OF INTERESTS**

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

#### **Analysis:**

Chapter 1 of the mining and reclamation plan is an introduction describing where information is located in the plan, and proposed changes are minor and general in nature.

Ownership and control information is in Chapter 2. The applicant is Co-Op Mining Company, and the mining and reclamation plan includes Co-Op's address, telephone number, resident agent, and employer identification number. The application also shows the officers and directors of CW Mining Company, a corporation which is doing business as Co-Op Mining Company. Thus, these people are, in effect, the officers and directors of Co-Op Mining Company. CW Mining Company will pay the abandoned mine reclamation fee.

Table 2-1 shows property ownership in and contiguous to the current and proposed addition to the permit area. This information and the legal description in Section 2.2.2 correspond with the information on Plates 2-1 and 2-2 and appear to be correct.

The current plan includes MSHA numbers for the Bear Canyon No. 1 and No. 2 Mines, and the application shows an MSHA number for the proposed facilities the Bear Canyon No. 3 Mine. The MSHA number for the Bear Canyon No. 4 Mine will be included during phase II of Wild Horse Ridge permitting (not yet proposed).

#### **Findings:**

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

### **VIOLATION INFORMATION**

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

#### **Analysis:**

Appendix 2-A of the current mining and reclamation plan has a list of notices of violation and other enforcement actions taken by the Division, the Office of Surface Mining, and the Division of Air Quality. The applicant has received no violation notices in the past three years.

The plan says neither the applicant nor any subsidiary, affiliate, or persons controlled by or under common control with the applicant has had a federal or state permit to conduct coal mining and reclamation operations suspended or revoked in the five years preceding the date of submission of the application; or forfeited a performance bond or similar security deposited in lieu of bond.

**Findings:**

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

## **RIGHT OF ENTRY**

Regulatory Reference: 30 CFR 778.15; R645-301-114

**Analysis:**

The application includes copies of the leases for the areas proposed to be added to the permit area, and the legal descriptions in these leases match the areas shown on the permit area maps and in Section 2.2.2. It appears the applicant has the required right of entry.

**Findings:**

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

## **LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS**

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

**Analysis:**

The proposed operations will not be within 100 feet of a public road or within 300 feet of an occupied dwelling. The existing mine is within 300 feet of occupied dwellings, but the plan contains approval letters from the owners and renters of these buildings.

According to the current mining and reclamation plan, no portion of the area to be permitted is within an area designated as unsuitable for mining, and it has several paragraphs, some of which were revised for this submittal, describing why it should not be considered unsuitable. The Division is unaware of any study or petition for designation as unsuitable.

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GENERAL CONTENTS

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**Findings:**

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

**PERMIT TERM**

Regulatory References: 30 CFR 778.17; R645-301-116.

**Analysis:**

The projected termination date for mining operations was changed from 2007 to 2023, but the applicant has otherwise not proposed to change this section of the plan. The permit term would not change.

**Findings:**

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

**PUBLIC NOTICE AND COMMENT**

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

**Analysis:**

The application includes a copy of the proof of publication. The advertisements ran from December 7 through December 28, 1999, in *The Salt Lake Tribune*, the *Deseret New*, and the *Emery County Progress*.

**Findings:**

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

**FILING FEE**

Regulatory Reference: 30 CFR 777.17; R645-301-118.

**Analysis:**

The filing fee is not required except for new permits.

**Findings:**

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

**ENVIRONMENTAL RESOURCE INFORMATION****ENVIRONMENTAL RESOURCE INFORMATION**

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

**GENERAL**

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

**Analysis:**

Analyses of the existing, premining environmental resources within the permit and adjacent area that may be affected or impacted by the proposed underground mining activities are discussed under other headings in this TA

**Findings:**

A determination of adequacy for this section will be determined to meet the regulatory requirements when all other information in this TA are determined adequate.

**PERMIT AREA**

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

The permit area is described in Section 2.2.2 of the Application and shown on Plate 2-1, Permit Area Map. The permit area has the following boundaries:

Township 16 South, Range 7 East, SLBM

- Section 13: W1/4
- Section 14: S1/2, NE1/4
- Section 23: E1/2, E1/2 W1/2
- Section 24: W1/2, SE1/4, W1/2 NE1/4, SE1/4 NE1/4
- Section 25: ALL
- Section 26: NE1/4 NE1/4, NW1/4 NE1/4, N1/2 SW1/4 NE1/4

Township 16 South, Range 8 East, SLBM

- Section 19: S1/2 NW1/4, SW1/4, SW1/4 SE1/4
- Section 30: W1/2, W1/2 NE1/4, NW1/4 SE1/4
- Section 31: NE1/4 NW1/4, NW1/4 NE1/4

The applicant states that a total of 3,336.18 acres are included in the permit area and lease areas. The phrase "lease and permit area" is confusing since the permit and lease areas can be different. The applicant needs to clarify the permit acreage.

With the addition of the Wild Horse Ridge amendment, the permit acreage increased from 1,377.75 acres to 3,336.18 acres. The applicant should state the change acreage before and after the approval of the Wild Horse Ridge project in the mining and reclamation plan (MRP) text and on Plate 2-1. The Division needs this information for a history of the mining activities.

The Division checked Plate 2-2 and noticed that the permit boundaries do not match the legal description. The permit boundary in Section 26 in the SW1/4 NW1/4 appears to be 200 feet short on the map.

The disturbed area boundaries for the Wild Horse Ridge are shown on Plate 2-4B, Plate 2-4C, Plate 2-4F and Plate 2-4G, which are the surface facilities maps. The disturbed area boundaries are also shown on the premining and postmining contour maps. The disturbed acres are listed in Section 3.3.14 on Table 3.3-1, Surface Disturbance Summary. The applicant will increase the disturbed area from 29.10 acres to 35.99 acres. None of the new disturbed acreage contains lands disturbed by mining activities prior to 1977. The new disturbed areas include the Wild Horse Ridge access road, conveyor belt access/topsoil stockpile, upper conveyor belt No. 1 and No. 2 access roads, and the Wild Horse Ridge Blind Canyon seam portal area.

The Division needs a copy of the permit boundary map in an AutoCAD file if possible. The map should also include the following:

- The permit boundaries
- The permitted acreage
- The changes to the permit boundaries including the approximate dates when changes were made
- The disturbed area boundaries
- The disturbed acreage
- The changes to the disturbed boundaries including the approximate dates when changes were made

Note: the Division is in the process of getting all permittees to submit AutoCAD files for permit and disturbed area boundaries. If the applicant has any questions about this issue, they should contact Wayne Western at the Division.

#### **Findings:**

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

**R645-301-121.200**, The applicant must clearly state how many acres are in the permit area. The phrase "lease and permit area" is confusing, since the lease and permit boundaries are not always identical.

**R645-301-521.190**, The applicant must state the before and after acreage in the MRP and on Plate 2-1. Information in the MRP must include a description of the acreage

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**ENVIRONMENTAL RESOURCE INFORMATION**

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added (Township, Range and Section), the number of acres, the project name (Wild Horse Ridge) and the approximate date the change was made.

**R645-301-521.132**, The permit boundary on Plate 2-1 does not match the description on Section 2.2.2. The permit boundary in Section 26 in the SW1/4 NW1/4 appears to be 200 feet short on the map.

**R645-301-521.132, R645-301-521.163 and R645-301-521.190**, The applicant must give the Division a copy of the permit boundary map, Plate 2-1, in an AutoCAD file. The AutoCAD map must also include 1) the permit boundaries, 2) the permitted acreage, 3) the changes to the permit boundaries including the approximate dates when changes were made, 4) the disturbed area boundaries, 5) the disturbed acreage and 6) the changes to the disturbed boundaries including the approximate dates when changes were made.

## **HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.12; R645-301-411.

### **Analysis:**

The current MRP contains information about one cultural resource site, the Bear Creek Shelter, in the area of the lower part of the conveyer. The application contains a report discussing the significance of this site and also showing results of a survey of the entire area proposed to be disturbed. No other sites were found. The Bear Creek Shelter is considered eligible for listing in the National Register of Historic Places.

The application contains a copy of a cultural resources report done by Kenneth Juell of the University of Utah Archeological Center. Part of the survey was done in the Wild Horse Ridge area and included four drill sites and associated access roads, mainly on Wild Horse Ridge. No cultural resource sites were found. According to this report, no other sites had previously been found in the area.

### **Findings:**

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

## **CLIMATOLOGICAL RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.18; R645-301-724.

### **Analysis:**

The Mayo and Associates PHC, dated August 1999, incorporates current climatic information into the plan. Average annual precipitations are recorded between 10 and 15 inches from lower

elevation gauging stations within the permit and adjacent area. Average annual precipitation is recorded as 29 and 33 inches in the high elevation gauging stations. The Palmer Hydrologic Drought Index for Utah Division 4 and Division 5 climatic regions are presented and discussed.

**Findings:**

The application meets the minimum requirements for this section.

## VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.19; R645-301-320.

**Analysis:**

Appendix 9-G is a report on the vegetation of the area that would be disturbed. It includes quantitative measurements of vegetative cover and woody plant density in the proposed disturbed area and a reference area. It also contains measurements of vegetation productivity.

The proposed disturbed area has a variety of vegetation communities because there is a variety of aspects and soils over the length of the proposed conveyor and road. Except for the facilities area, disturbances would be fairly narrow and small in each community, so the different communities were not sampled separately. This did not, however, lead to a large sample size.

The vegetation communities in the proposed disturbed area include varying amounts of riparian, Salina wild rye, pinyon/juniper, Ponderosa pine, mountain brush, and sagebrush/grass. Dominant species were Salina wild rye, needle and thread grass, Utah juniper, and smooth brome, but several other species were also present. Vegetative cover was 42.50%, and woody plant density was 1010 per acre.

The reference area was chosen to be transitional between the lower drainage area and the pinyon/juniper/grass areas on the upper slopes. Dominant species in the reference area were Salina wild rye, corymbid buckwheat, rubber rabbitbrush, Kentucky bluegrass, and hoary aster. While the proposed disturbed area was strongly dominated by grasses, the proposed reference area had cover more balanced between grasses and shrubs. Vegetative cover was 46.25%, and woody plant density was 1405 per acre.

Productivity in the area proposed to be disturbed was 125.31 pounds per acre for herbaceous species and 122.37 pounds per acre for woody species for a total of 247.68 pounds per acre. Vegetation productivity in the reference area was 286.17 pounds per acre for herbaceous species and 310.15 pounds per acre for woody species for a total of 596.32 pounds per acre. Obviously, productivity in the reference area was much greater than in the proposed disturbed area. This is acceptable because the success standard would be higher than what currently exists, and the consultant who wrote the report argues that the reference area continues to be an appropriate standard.

**Findings:**

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

## FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.21; R645-301-322.

### Analysis:

#### Wildlife Information

Plates 3-3 and 10-1 have been revised to include the proposed addition to the permit area. These maps show raptor nests and big game habitat. The entire proposed addition to the permit area is either critical elk or deer winter range. Several raptor nests are in the area including two within about 2000 feet of the proposed surface facilities.

The right fork of Bear Creek consistently has water in a few places, but it is not a fishery.

The Division has consulted with the Division of Wildlife Resources concerning the adequacy of wildlife information in the application and in the current MRP. The applicant has updated the raptor nesting information as a result of the survey conducted earlier this spring.

#### Threatened and Endangered Species

Most threatened or endangered species that could be in Emery County occur at lower elevations than the mine and have no habitat in the proposed disturbed area. These are Barneby reed-mustard, Jones cycladenia, last chance Townsendia, Maguire daisy, Despain footcactus, Wright fishhook cactus, and the Winkler cactus. There have been no confirmed sightings of black-footed ferrets in Emery county in several years.

Bald eagles are common in the area during the winter and could occasionally fly through or roost in the proposed addition to the permit area. Mining would have negligible effects on these birds.

The proposed disturbed area does not contain habitat for the southwestern willow flycatcher, but it is not known whether suitable habitat exists in other parts of the proposed permit area addition. The proposed disturbed area has some willows and riparian vegetation, but it was not enough that it was encountered in vegetation cover samples or that it would provide habitat for southwestern willow flycatchers. Woody plant density measurements included coyote willow at a density of 25 per acre.

Canyon sweetvetch (*Hedysarum occidentale* Var. *canone*) is listed by Region 4 of the Forest Service as a sensitive species. This species has been found in the proposed disturbed area, and locations are documented in the vegetation report in Appendix 9-G.

The Link Trail columbine (*Aquilegia flavescens* Var. *rubicunda*) is a Forest Service Region 4 sensitive species, and there are columbines in the right fork of Bear Creek (and elsewhere in the area) that have been tentatively identified as this species. The areas where these plants grow should not be disturbed.

**Findings:**

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

**SOILS RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

**Analysis:**

Chapter 8, Soil Resources, Sections 8.1 through 8.7, discusses the soil resources within the proposed Wild Horse Ridge project for the Bear Canyon Mine. Relevant soils information includes a prime farmland investigation, current and past soil surveys, soil characterizations, and substitute topsoil identification. The Analysis section discusses resource information as follows:

- Prime Farmland Investigation
- Soil Survey Information
- Soil Characterization
- Substitute Topsoil

**Prime Farmland Investigation**

A Prime Farmland site investigation was performed by the Natural Resources Conservation Service (NRCS). A negative determination was made for Prime Farmland or farmland of statewide importance within the Wild Horse Ridge area (sections 24 and 25 T.16S. R. 7E. and sections 19 and 30 T.16S. R. 8E). The determination letter from the NRCS is dated July 9, 1999, and is included in Appendix 8-C.

**Soil Survey Information**

Chapter 8 supplies soil resource information for the Bear Canyon Mine and the proposed Wild Horse Ridge expansion based on six soil surveys as follows:

1. 1980. Soil and vegetation survey for Bear Canyon, USDA San Rafael Soil Conservation District and the Soil Conservation Service, Appendix 8-B pp 1 to 13.
2. 1990. Order I soil survey, USDA Soil Conservation Service, Appendix 8-B pp 13
3. 1992. Substitute topsoil survey for Bear Canyon, Appendix 8-E.
4. 1996. Soil samples collected by Co-Op for Wild Horse Ridge. Appendix 8-F.
5. 1998. Order II soil survey of Wild Horse Ridge, USDA Natural Resource Conservation Service.
6. 1999. Order I soil survey of Wild Horse Ridge, conducted by Environmental Industrial Services, Appendix 8-F. The survey incorporates information from the 1998 Order II, NRCS soil survey and the 1996 soil sampling. The Wild Horse Ridge site contains seven soil mapping units as follows:

**ENVIRONMENTAL RESOURCE INFORMATION**

- A Pathead-Cabba Complex, 30 to 70 % slopes
- B Winetti, High Elevation, 5 to 30 % slopes.
- C Winetti, High Elevation-Rock Outcrop, 10 to 30 % slopes
- D Doney, Deep, 10 to 30 % slopes
- E Datino-Guben Complex, 30 to 80 % slopes
- F Guben-Pathead Complex, 30 to 80 % slopes
- G Doney-Cabba-Podo Complex, 30 to 80 % slopes

All mapping and soil survey work were performed according to the standards of the National Cooperative Soil Survey. Based on the site-specific soil descriptions, and laboratory data, each of the soils was classified according to current NRCS soil taxonomy, and correlated with NRCS's Order II soil survey. Documentation of field data is presented in Map B-Soil Data Collection Map; Appendix C-Field Soil Profile Descriptions and Transect Data; Appendix D-Soil Profile and Landscape Photographs. Appendix F contains information comparing soil mapping units between the 1999 Order I soil survey to NRCS's Order II soil survey. Adjustment summarizations were given for each specific change in identifying and renaming soils within the Wild Horse Ridge area.

The 1990 and 1999 Order I soil survey for the Bear Canyon Mine and Wild Horse Ridge cover approximately 32 acres in Bear Canyon and in the Wild Horse Ridge mine expansion area. Approximately 480 acres are mapped on two soil maps (Plate 8-1 and Plate 8-1A) which are scaled at 1-inch equals 200-feet, with 5-foot contour intervals. A total of 10 different soil mapping units are identified. Plate 8-1 shows three soil mapping units as DZE, PDR, and TR, with "D" identified as disturbed area soils. These three mapping units are for the existing Bear Canyon Mine disturbance area. Plate 8-1A identifies the 7 soil mapping units as contained in the 1999 Order I soil survey for the Wild Horse Ridge mine expansion project as follows:

Appendix 8-F Soil Map Unit	MRP Soil Map Unit	Soil Name
A	PC	Pathead-Cabba Complex
B	WIN	Winetti, High Elevation
C	WR	Winetti, High Elevation-Rock Outcrop
D	DON	Doney, Deep
E	DG	Datino-Guben Complex
F	GP	Guben-Pathead Complex
G	DCP	Doney-Cabba-Podo Complex

Appendix 8-F identifies the approximate range and average soil salvage depth for each soil map unit, based on evaluations of all field and laboratory data, plant rooting depth and soil rock content. In the following table, DOGM staff have itemized the depth of salvage along with root and subsurface rock information for each soil type:

**ENVIRONMENTAL RESOURCE INFORMATION**

Map Unit	Salvage Layer (inches)		Fine Roots Rooting Depth (inches)	Subsurface Rock Within Soil Salvage Layer (percent)
	Approximate Range	Average Depth		
PC	8 - 15	12	15	<5 to 45
WIN	10 -30	15	no pit	no pit information
WR	0 - 20	10	24	50 to 60
DON	30 -60	40	60	7 to 15
DG	20 - 40	30	20	45
GP	0 - 30	10	36	60
DCP	6 - 30	15	34	12 to 40

**Soil Characterization**

Section 8.3, Soil Information, identifies and describes each of the 10 soil groups as contained in the 1990 and 1999 Order I soil surveys. Soil descriptions for each of the 10 soil mapping units are summarized in Table 8.3-1 and in Section 8.3.2.

*Wild Horse Ridge*

In May 1999, a site specific Order 1 soil survey for the proposed Wild Horse Ridge project area was performed and prepared by Mr. Daniel Larsen, Soil Scientist, Environmental Industrial Services (Appendix 8-F). The detailed survey contains soil descriptions, soil pedon descriptions, soil salvage suitability analysis, laboratory soil testing data, field soil profile descriptions, soil and landscape photographs, soils map, soil data collection map and salvageable soils map. Soil pedons were characterized by the soil horizons at each sampling location. All profile descriptions were recorded on standard NRCS forms and are provided in Appendix C within Appendix 8-F. Field parameters for each soil pedon description includes horizon information, soil color, texture, rock fragment, soil structure, roots, clay films, and effervescence with 0.1N hydrochloric acid. In addition, general site descriptions include vegetation, climate regimes, land form physiography, relief, elevation, slope, aspect, erosion condition, permeability, drainage class, depth to saturation (ground water) if encountered, salts or alkali if present, and surface rock. Generalized soil properties are summarized as follows for each soil type:

In 1996, four soil pits (WHRS-1 thru WHRS-4) were analyzed in the Wild Horse Ridge planned disturbance area. Test results are included with the Order I soil Survey in Appendix F. Pit locations are shown on Plate 8-1A.

## ENVIRONMENTAL RESOURCE INFORMATION

Map Unit	Map Symbol	Land Form	% Slope	Parent Material	Soil Depth	Texture	Rock Fragment Class	General Vegetation
A	PC	foothills	30-70	colluvium and shale	shallow to deep	sl, l, cl	stony to very cobbly	Pinion-Juniper
B	WIN	narrow canyon bottoms	5-30	alluvium and colluvium	deep	sl, l, ls	gravelly to bouldery	Cottonwood Douglas-fir Dogwood Wild rose
C	WR	narrow canyon bottoms	5-30	alluvium, colluvium and sandstone	shallow to deep	sl, l, ls	gravelly to bouldery	Cottonwood Douglas-fir Dogwood Wild rose
D	DON	toe slope, slight bench	10-30	colluvium, slope wash	deep	sl, l, ls	non-stony to stony	Ponderosa Pine Juniper Douglas-fir
E	DG	steep canyon slope, north aspect	30-80	colluvium and shale	moderate deep to deep	sl, l, cl	very stony to non-stony	Douglas-fir Pinion Mt. Mahogany Serviceberry
F	GP	canyon side slope	30-80	colluvium, sandstone and shale	shallow to moderate deep	sl, l, cl	very stony to bouldery	Douglas-fir Pinion Mt. Mahogany
G	DCP	steep canyon slope, south aspect	30-80	sandstone, shale and colluvium	shallow to moderate deep	sl, l, cl	very stony to non-stony	Pinion-Juniper Grass

Seven soil samples were selected from representative soil layers during soil inventory and were characterized according to the State of Utah Division of Oil, Gas and Mining (DOGM) guidelines for topsoil and overburden<sup>1</sup>. Sampled parameters include: pH; electrical conductivity; saturation percent; SAR includes Ca, Mg, and Na; texture includes % very fine sand, sand, silt and clay; TOC (total organic carbon) includes organic matter percent; CaCO<sub>3</sub>; Boron (CaCl<sub>2</sub> extraction); Selenium (AB-DPTA extraction); AWC (available water capacity) includes 1/3 and 15 bar analyses; and ESP.

Soil samples were sent to Inter-Mountain Laboratories, Inc. for analysis. Appendix B contains the laboratory data sheets for all analysis on the seven samples. Some summaries of soil laboratory results are noted below, excluding sample CW10-1 which is discussed below:

<sup>1</sup>Leatherwood, James and Dan Duce. 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.

**ENVIRONMENTAL RESOURCE INFORMATION**

Parameter	Results (Range)	DOGM Rating *
pH	7.4 - 7.8	Good
EC (mmhos/cm)	0.33 - 0.64	Good to Poor
Saturation %	30 - 48	Good
SAR	0.3 - 0.7	Good
Texture	SIL, SL, L	Good
Boron (mg/Kg)	0.5 - 1.6	Good
Selenium (mg/Kg)	<0.02	Good
Avail Water Cap. (in/in)	0.06 - 0.14	Fair to Good

\* State of Utah Division of Oil, Gas and Mining (DOGM) guidelines for topsoil and overburden.

For all soils, except CW10-1, soil tests indicate that the soils generally rate fair to good for reclamation use. The one exception is soil sample CW10-1, which was taken from a light-colored soil layer at about 20 to 30 inches in depth on a road cut in Soil Map Unit F. The sample was taken to document properties of a calcic horizon in a Guben soil. Soil test results indicate an unacceptable level of selenium (0.26 mg/Kg) and a poor rating for electrical conductivity (10.2 mmhos/cm). The sample was also higher in boron (2.5 mg/Kg), calcium (7.5 meq/L), magnesium (160 meq/L), sodium (35 meq/L), SAR (3.7) and pH (8.3) than the other soil samples. The CW10-1 sample site is at the edge of the existing road accessing the future portal site. The soil survey states that Co-Op Mining does not anticipate that this soil would be involved in site disturbance for portal development and that further assessment may be required if disturbance along this section of road is proposed. Every effort should be made to minimize disturbing and/or mixing the deeper subsoils (20 to 30 inches) of this section of road cut.

The **percent rock content** within the mine site disturbance or proposed facilities area is the main deterrent for soil suitability based on the current DOGM guidelines. Although DOGM suitability criterion considers >30% (by volume) rock fragments (for both gravels <3" in size and cobbles 3 to 10" in size) to be unacceptable, and >10% stones and boulders >10" in size to also be unacceptable, the recent trend by DOGM is to salvage **native soils with intrinsic or indigenous rock content**. Using indigenous rocky soils should enhance reclamation success by providing an environment similar to native conditions. However, higher rock content greater than is present in the surface soils needs to be avoided. Natural, intrinsic rock content provides for a more stable reclaimed surface, aids in water harvesting and water holding capacity of interstitial soils, and creates wildlife habitat and niches on the surface were surface boulders and larger cobble sized rocks are placed.

**Substitute Topsoil**

The applicant does not propose any borrow as a source for substitute topsoil. However, in 1992, in-place overburden and disturbed soils within the facilities area, were evaluated for use as substitute topsoil material. Results are contained in Appendix 8-E.

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**ENVIRONMENTAL RESOURCE INFORMATION**

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**Findings:**

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

**LAND-USE RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.22; R645-301-411.

**Analysis:**

According to information in the application and the current MRP, the current permit area and the proposed addition are zoned by Emery County as Mining and Grazing and Critical Environmental. The land is used for mining, cattle grazing, timber, recreation, and wildlife. Parts of the area are included in a Private [Posted] Hunting Unit, and the access road to the Wild Horse Ridge surface facilities also provides access to a hunting cabin. This road will be maintained during the mining operations.

The application discusses previous mining activity in the Bear Canyon area. Various entities have operated these mines since 1885.

The application says there are no public parks, cemeteries, or units of the Wild and Scenic Rivers system or the National System of Trails.

**Findings:**

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

**ALLUVIAL VALLEY FLOORS**

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

**Analysis:**

The right fork of Bear Creek is an intermittent stream at the very upper end of the watershed. The stream channel contains a thin veneer of alluvial deposits derived from the bedrock immediately adjacent on the canyon walls. As indicated in the USDA/Natural Resources Conservation Service letter in Appendix 8-C, "These areas can be very narrow and are adjacent to these small streams." That same letter indicates that "After site investigation, the NRCS has determined that no prime farmland . . . occurs on the Wild Horse Ridge area . . ." A location map is included. The annual rainfall is about 30 inches in the upper elevations decreasing to about 12 inches in the lower elevations. There is no historical evidence of flood irrigation being used in the canyon or of any agricultural activity in the canyon. There are no stream deposits sufficient to conduct agricultural activities. There are no alluvial valley floors.

## **Finding**

The amendment meets minimum regulatory requirements.

## **PRIME FARMLAND**

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

### **Analysis:**

A Prime Farmland site investigation was performed by the Natural Resources Conservation Service (NRCS). A negative determination was made for Prime Farmland or farmland of statewide importance within the Wild Horse Ridge area (sections 24 and 25 T.16S. R. 7E. and sections 19 and 30 T.16S. R. 8E). The determination letter from the NRCS is dated July 9, 1999, and is included in Appendix 8-C.

### **Findings:**

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

## **GEOLOGIC RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

### **Analysis:**

Changes to the text, mostly minor, have been made on pages 6-3, 6-6, 6-10, 6-11, 6-13, 6-16, 6-18, and 6-19 of Chapter 6. The proposed permit boundary as shown on revised Plates 6-1 through 6-12 includes federal leases U-020668 and U-38727 and fee coal owned by C.O.P. Development. Plate 6-1 is the Geology Map. Plates 6-2, 6-6, and 6-10 are overburden maps, Plates 6-3, 6-7, and 6-11 are isopach thickness maps, Plates 6-4, 6-8, 6-12 are structure contour maps, and Plates 6-5 and 6-9 are interseam isopach maps. Plates 6-2 through 6-12 are based on information from numerous borings and outcrop measurements: logs from many of these borings are in the MRP.

Plates 7-9 and 7-9A are stratigraphic cross-sections. Generalized logs for bore-holes T-1, T-2, T-3, T-5, SDH-1, SDH-2, and SDH-3 are shown on Plate 7-9 and those for WHR-1, WHR-2, WHR-3, WHR-5, WHR-8, F-76-1, F-77-5, F-76-6, 77-3A, and F-77-11-A are on Plate 7-9A. The logs are not arranged on Plate 7-9A in a sequence that would usually be expected of a geologic cross section. 7-J1 and 7-J2 are stratigraphic cross-sections based on logs from bore holes SDH-1, SDH-2, MW-116, and MW-117. Well completion diagrams for SDH-1, SDH-2, SDH-3, MW-116, and MW-117 are in Appendix 7-A, but the MRP does not contain original logs for any of these bore holes. The well completion diagram for MW-114 has been submitted for inclusion in Appendix 7-A. Except for F-76-4 and F-77-B (Plate 7-9A), Plate 6-2 shows the locations for all bore-holes on Plates 7-9, 7-9A, 7J-1, and 7J-2.

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**ENVIRONMENTAL RESOURCE INFORMATION**

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Appendix 7-A also contains logs for in-mine drill-holes 1- and 2-UP and 1-, 6-, 7-, 9-, 10-, 11-, 12-, 13-, and 14-DOWN and SBC-2, -3, and -4, but locations for these are not on a map. Locations for an "H" series of in-mine bore holes are shown on Plates 6-5 and 6-7, but there are no logs for these holes in the MRP.

Drill-hole DH-3 was abandoned in 1993 and replaced by DH-4. Bore-hole logs and well completion diagrams for DH-1, DH-2, DH-3, and DH-4 are in Appendix 7N-G (p. 6-13).

Logs for drill holes TS-6 through TS- 10 and TS-14 are in Appendix 6-A, but logs are not available for TS-12 and TS-13; there is apparently no TS-11. Locations for TS-6 through TS-10 are shown on Plates 6-9, 6-10, and 6-11.

There is no hydrology information available for the "WHR" series of bore-holes (Section 7.1-4, p. 7-20).

The current MRP includes a description of the areal and structural geology of the proposed permit and adjacent areas, including federal leases U-020668 and U-38727 and fee coal tract owned by C.O.P. Development. The description is based on maps and plans required as resource information for the plan, detailed site specific information, and geologic literature and practices. Additional geologic information has been submitted as part of Appendix 7J-I, Investigation of Groundwater and Surface Water Systems and Probable Hydrologic Consequences, a report by Mayo and Associates, LC. These descriptions show how areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water.

Coal isopach thickness maps indicate the Blind Canyon and Tank seams, but not the Hiawatha seam, are of mineable thickness in portions of the Wild Horse Ridge area. The Hiawatha seam was previously thought to be continuous and of mineable thickness, but recent drilling has revealed several sandstone channels that render the seam unmineable in the vicinity of Bear and Fish Creeks (pp. 6-18 and 6-19 and Plate 6-7) and this seam is described as not mineable in Table 3C-1. Revised Plates 3-4A and 3-4C show projected mining in the Blind Canyon and Tank seams, respectively, in the Wild Horse Ridge addition.

Subsidence is discussed in Appendix 3-C. Total calculated subsidence in the Wild Horse Ridge area is 7.3 feet, based on an average total thickness of 16.5 feet for the Tank and Blind Canyon seams: in the existing permit area, the calculated maximum subsidence is 14.1 feet based on an average total thickness of 22 feet for the Tank, Hiawatha, and Blind Canyon seams (Table 3C-1). Average thickness of the Blind Canyon seam is 9 feet and average depth is 1,200 feet, and for the Tank seam the averages are 7.5 feet thick and 950 feet deep.

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 Utah Coal Mining 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 to the Division to waive, in whole or in part, the requirements of the bore hole information or analysis required of this section.

**Findings:**

Information on geologic resources is considered adequate to meet the requirements of this section.

**HYDROLOGIC RESOURCE INFORMATION**

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

**Analysis:**

**Sampling and analysis**

Holding time and sample analysis problems occurred at sites 16-7-13-1, 16-18-14 and 16-8-20-1. See Tables 2b and 3 in this TA. For surface water site WHR-1, fluoride was not distilled for baseline data on June and August 1993; however, fluoride is no longer considered a required baseline parameter. Holding time expired on Sulfate on 10/93. For all samples dissolved metals, which were filtered at lab, were received within one day. Lab sheets for all sites where data was collected on July 1991 were missing from the amendment since they could not be found. However, the data had been recorded and was submitted.

**Baseline information**

Appendix 7-M, Spring and Seep inventory Federal Lease Area, provides a discussion of the seeps, springs, and streams in and adjacent to the Wild Horse Ridge addition. Attachment 7M-A, Surface and Groundwater Water Quality Information provides the lab sheets for baseline monitoring. Table 7.1-8, Water Monitoring Matrix: Operational Phase of Mining lists the proposed monitoring plan for the mine which now includes the new addition. The surface and ground water parameters monitored remain the same as in the original Mining and Reclamation Plan. The plan clearly states that the operational monitoring will continue through reclamation to bond release. Also, the monitoring points are divided into wells, springs, and streams. This is consistent with the PHC, which is formatted in this manner, and is standard practice for coal mines that the Division regulates.

Although included, adjacent area sampling associated with the Mc Cadden Hollow area were not reviewed. This information was not considered to be directly related to the proposed Wild Horse permit area, but will be considered applicable to the Cumulative Impact Area (CIA) information.

**Ground-water information**

Numerous sources for ground water related information is found throughout the plan. The baseline information relative to groundwater, seeps, and springs in the proposed Wild Horse Ridge permit are presented in Tables 1, 2 and, 2b in this TA. Data for groundwater well information, identified in Table 1, were collected in 1996 and 1997.

## ENVIRONMENTAL RESOURCE INFORMATION

**Table-1: Wild Horse Ridge Monitoring Wells\***

<b>Well Number</b>	<b>Formation Monitored &amp; Relative Location</b>	<b>Screen Intervals</b>	<b>General Observations</b>
MW-114	Spring Canyon Sandstone - East of the Bear Canyon Fault.	Upper screen interval 1795-1805 ft. Lower screen interval 1819-1829 ft.	Water elevation measured on 8/22/96, 09-24-96 and 10-23-97 varied from 7649.5 to 7650.5 feet. Potentiometric water level - approximately 26 ft below Hiawatha Seam.
MW-116	Spring Canyon - East of the Bear Canyon Fault	Upper screen interval 1720-1730 ft. Lower screen interval 1743.3-1753.3 ft.	Water elevation measured on 10/18/95, 7/19/96, 09/24/96 and 10/23/97 varied from 7743.9 to 7744.5 feet. Potentiometric water level - approximately 71.2 ft below Hiawatha Seam.
MW-117	Spring Canyon - near fault line - East of the Bear Canyon Fault Section 12, T. 16 S. R.7 E.	Upper screen interval 1720-1730 ft. Lower screen interval 1743.3-1759.7 ft.	At 1720 ft. fault gouge and fractured material encountered. Caving continued with out a defined Star Point Formation. Water elevation measured on 10/18/95, 07/19/96, 9/24/96 and 10/23/97 varied from 7746.2 to 7746.5 feet. Hiawatha Seam not identified on log.

\*Data obtained from Cyprus-Mohrland Project Drill Report.

The Wells MW-114 and 117 will be monitored for water level prior to mining the Wild Horse Ridge to verify the existing water elevations recorded at these wells are the same as the elevations obtained during 1996 and 1997. This way, should mining in the Wild Horse Ridge intercept water from a sand channel or other significant in mine flow, the pre-mining status at these wells will not be in question. The Operator commits to collect water age dating and chemical make-up to verify the information found west of the Bear Canyon Fault can be applied to the Star Point Sandstone Formation east of the Fault. This commitment extends to all new wells within and adjacent to the Wild Horse Ridge area. See pg.7-34.

### Spring Data

Spring sampling was conducted for the Wild Horse Ridge lease addition and adjacent area as summarized in Table 2 below. Information on springs within and adjacent to the Wild Horse Ridge area include springs WHR-2, WHR-3 and WHR-4. Spring WHR-4A was included in the Probable Hydrologic Consequence document and on a map, but there was no flow recorded for that location (Figure 1, Mayo and Associate Report, August 1999). Spring identification labels have been clarified by providing both labels on Plate 7-4, Water Monitoring and a cross reference table is included in Appendix B of the Mayo and Associates Report. In addition, Table 1 includes a legend of geologic formation abbreviations, and Figure 15 includes the geologic structure for the various stiff diagrams.

**Table 2: Baseline Spring Sampling Wild Horse Ridge Mayo Report**

Site/Location	No. Data Samples sampling period	Geology	Flow rate (gpm) Min/Max
WHR-2 Fish Creek LF-East	7 7/31/91 - 8/30/94	Tf-TKnh	0.2/20
WHR-3 Head Fish Creek	8 7/30/91 - 10/31/94	Tf	0.5/70
WHR-4/SBC-13/SBC-16 Fish Creek LF-West	8 7/30/91 - 10/31/94	Tf-TKnh	0/65
WHR-5/SBC-15 Bear Canyon RF (above coal outcrop)	8 7/31/91 - 10/30/94	Tf-TKnh	0.0/17
WHR-6/SBC-14 Bear Canyon RF (near disturbed area)	8 10/26/93 - 6/24/97	Kbh	0.5/15
WHR-7 Fish Creek LF- West	1 7/30/91	Kbh	40
WHR-8 Wild Horse Ridge	1 7/31/91	Kbh	5
16-7-24-3 Bear Canyon Cliff Face	1 3/17/99	Kbh	no flow reported- chemical analysis obtained
16-7-24-4/SBC-17 Bear Canyon Fault	1 3/17/99	Kbh	no flow reported- chemical analysis obtained

Tf- Flagstaff Formation

TF-TKnh- at the contact between the Flagstaff and North Horn Formation

Kbh-Black Hawk Formation

## ENVIRONMENTAL RESOURCE INFORMATION

Revised :April 16, 2001

Table 2b: Baseline Spring Sampling Wild Horse Ridge

Site/Location	Date				Comments
	1st Q	2nd Q	3rd Q	4th Q	
WHR-2 1991 1992 1993 1994 1997		6/24/93 5/30/94 6/25/97	7/31/91 8/15/93 8/30/94 9/10/97	10/28/92 10/13/93 10/31/94 10/20/97	Left Fork Fish Creek east side dry 10/31/94
WHR-3 1991 1992 1993 1994 1997		6/24/93 5/30/94 6/25/97	7/30/91 8/15/93 8/30/94 9/10/97	10/27/92 10/13/93 10/31/94 10/20/97	Head waters of Fish Creek Fluoride not distilled 10/92, 6/93, 8/93. Holding time expired on Ortho Phosphate 10/13/93. Dissolved metals filtered at lab received within a day. Sample > 6 deg C on 10/94.
WHR-4 1991 1992 1993 1994 1997	03/22/93 03/30/94	6/24/93 5/30/94 6/24/97	7/30/91 8/15/93 8/29/94 9/10/97	10/28/92 10/13/93 10/31/94	Left Fork Fish Creek west side. 03/93, 03/94 not accessible. Fluoride not distilled 10/92, 6/93, 8/93. Holding time expired on Ortho Phosphate 10/13/93. Dissolved metals filtered at lab received within a day. Sample > 6 deg C on 10/94.
WHR-5 1991 1992 1993 1994 1997		6/24/93 5/30/94 6/24/97	7/30/91 8/15/93 8/29/94 9/10/97	10/28/92 10/13/93 10/31/94 10/20/97	Right Fork - Left Fork Bear Canyon 03/93, 03/94 not accessible. Fluoride not distilled 10/92, 6/93, 8/93. Holding time expired on Ortho Phosphate 10/13/93. Dissolved metals filtered at lab received within a day. Sample > 6 deg C, on 10/94.
WHR-6 1993 1994 1995 1997	3/23/94	6/01/94 5/24/95 6/24/97	8/28/94 8/22/95 09/18/97	10/26/93 10/26/94 10/28/97	Right Fork - Right Fork Bear Canyon 03/94 not accessible. Holding time expired on Sulfate 10/93. Possible matrix interference with Cl-6/94. Possible matrix interference with Nitrite- 10/94. Possible matrix interference with Selenium- 5/95. Dissolved metals filtered at lab received within a day. Sample > 6 deg C, on 8/95.

The Mayo Report discusses spring discharge rates by formation using a calculated R-value which is the sum of the minimum flows, over the sum of the maximum flows for all springs issuing from the formation. This analysis provides a generalized description for the formation while individual r-values for springs within the formation may vary from the generalized description. Data used for the springs do not have a continuous record; therefore, high and low flow data is not represented for each year within the period

of record (1991 to 1999). The climate, from 1991 to 1999, consisted of the end of a 4 year long dry spell, moving into short periods of moderately to severely wet climate disrupted by intermittent dry periods (Region 4 and 5 drought index). Some data used in the analysis may be influenced by historic mining activities. Although the Mayo Report states that Figure 6a and 6b represent the maximum and minimum discharge rates from each formation, the data record is not continuous enough to support this statement. However, the general high and low flow pattern for these formations is probably representative.

### **Surface-water information**

The Mayo Report identifies Trail Creek, Bear Creek, Fish Creek and Lower Cedar Creek as perennial. The upper Trail Creek, Mc Cadden Hollow, Blind Canyon, and Upper Cedar Creek are intermittent or ephemeral.

Baseflow to Lower Trail Creek was attributed to be sustained by flow from springs in the area especially TS-1. Baseflow appears to be about 25 gpm for the period of record until mid 1995 where baseflow appears to increase. Baseflow to Bear Canyon Creek is estimated to be about 30 to 50 gpm and is attributed to be sustained from springs such as FBC-12, emerging from the North Horn Formation.

According to the PHC, Fish Creek is a perennial stream. During 1996 and 1997 low flow was 15 gpm in Fish Creek in both the Left and Right Forks. It's suspected that these drainages may become intermittent during periods of prolonged drought.

### **Baseline cumulative impact area information**

Adjacent area information is included within this permit application package for areas where future mining is likely to occur.

ENVIRONMENTAL RESOURCE INFORMATION

**Table 3: Baseline Stream Sampling Wild Horse Ridge**

Site/Location		Date				Site Flow Rates (gpm)	Comments
		1st Q	2 <sup>nd</sup> Q	3rd Q	4th Q		
CK-1 (not on Map)			06/94 06/95 07/96		10/94 10/95 10/96	Max 1104 Min 103 Average 666	Field data only. No sample date.
CK-2 (not on Map)			06/94 06/95 07/96		10/94 10/95 10/96	Max 950 Min 4 Average 241	Field data only. No sample date.
LF-1	1994 1995 1996		06/09/94	07/10/95 07/16/96	10/27/94 10/18/95 10/15/96	Max 266 Min 15 Average 68.5	
RF-1	1994 1995 1996		06/09/94	07/10/95 07/16/96	10/27/94 10/18/95 10/15/96	Max 191 Min 15 Average 66.5	
WHR-1	1991 1992 1993 1994 1997	03/29/93 03/23/94	06/24/93 06/01/94 06/29/97	07/31/91 08/15/93 08/29/94 09/17/97	10/28/92 10/26/93 10/30/94	Max 650 Min 0 Average 89.0	No access on 03/93. Dry 08/94. No flow recorded 10/28.

**Modeling**

Modeling is not proposed to be used instead of data acquisition.

**Alternative water source information**

No additional information on alternative water source information was presented in this amendment.

**Probable hydrologic consequences determination**

The probable hydrologic consequences determination is provided in Mayo and Associates, LC "Investigation of Groundwater and Surface - Water Systems in the C.W. Mining Company Federal Coal Leases and Fee Lands, Southern Gentry Mountain, Emery and Carbon Counties, Utah: Probable Hydrologic Consequences of Coal Mining in the Bear Canyon Mine Permit Area and Recommendations for Surface Water and Ground Water Monitoring" August 1999. Pertinent portions from this determination will be used to update the CHIA and complete technical directive process at Birch Spring and Big Bear Spring.

**Findings:**

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

**MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

**Analysis:**

**Affected Area Boundary Maps**

The applicant did not give the Division a map that identifies the affected area boundaries. The Division usually assumes that the permit and affected area boundaries are the same unless otherwise noted. Information in the application suggests that the permit area and affected area boundaries are the same. The applicant did give the Division a permit boundary map, Plate 2-1. The Division found Plate 2-1 to be adequate.

**Archeological Site and Cultural Resource Maps**

The archaeological reports contain maps showing the locations of cultural resource surveys that have been done in the area.

**Existing Structures and Facilities Maps**

The only existing structure in the Wild Horse Ridge area mentioned by the applicant is a hunting cabin and the access road. Both are shown on Plate 2-4G and Plate 3-7G. The hunting cabin is not labeled on Plate 3-7G, but an outline of the building is shown. For clarification the access road and hunting cabin should be labeled on Plate 3-7G.

**Existing Surface Configuration Maps**

Plate 3-7F and Plate 3-7G, show the existing surface topography. The hunting cabin is not labeled but an outline of the building is shown on Plate 3-7G.

**Mine Workings Maps**

The applicant gave the Division maps that show the mine workings in the Blind Canyon Seam, Plate 3-4A, and the Tank Seam, Plate 3-4C.

**Monitoring and Sampling Location Maps**

Plate 7-4, Water Monitoring, shows nearly all the monitoring locations proposed in Table 7.1-8, Water Monitoring Matrix, Operational Phase of Mining. Sites SBC-3 and MW-117 could not be shown due to the scale of the map, however, they are shown on Plate 7N-2, Water Sampling Locations.

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**ENVIRONMENTAL RESOURCE INFORMATION**

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**Permit Area Boundary Maps**

Plate 2-1, Permit Area, show the location of the permit boundaries. The Division addressed the permit boundary maps in the permit area section of this TA.

**Surface and Subsurface Ownership Maps**

Plate 2-2 shows the surface ownership with the permit boundaries for the Wild Horse Ridge area. Plate 2-3 shows the subsurface ownership with the permit boundaries for the Wild Horse Ridge area.

**Surface Water Resource Maps**

Water rights have been updated on Plate 7-4. A check of the Utah Division of Water Rights Internet page shows the appropriate water rights have been shown on the map.

**Vegetation Reference Area Maps**

The vegetation reference area is shown on Plate 9-1.

**Contour Maps**

There are several maps that show the topography for the entire permit boundary, such as Plate 7-4, Water Monitoring. Plate 3-7F and Plate 3-7G show the location of the premining contours. Plate 3-7G shows the premining contours extending 100 feet beyond the disturbed area boundaries. Plate 3-2G shows the postmining contours extending 100 feet beyond the disturbed area boundaries. However, the operational map 2-4G does not show the contours extending 100 feet beyond the disturbed area boundaries by Sediment Pond D. For consistency the extent of the contours on the operational map should be the same as for those on the premining and postmining maps.

**Findings:**

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

**R645-301-121.200**, The applicant must label the hunting cabin and access road on Plate 3-7G and Plate 3-2G.

**R645-301-521.190**, On Plate 2-4G the applicant must show the contours extending 100 feet beyond the disturbed area boundaries. See the area by Sediment Pond D.

# **OPERATION PLAN**

## **MINING OPERATIONS AND FACILITIES**

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

### **Analysis:**

#### **General**

In Section 3.4 the applicant states, "Co-Op started its mining operating through an existing mine in the Blind Canyon Seam and later extended into the Hiawatha seam below. Access to the Hiawatha Seam was made in the summer of 1986 through two new portals in the outcrop, and through a rock slope tunnel from the Blind Canyon seam. In 1995, Co-Op extended operations into the Tank Seam, located above the Blind Canyon seam. In 1999 (2001), Co-Op plans to extend operations into the Blind Canyon and Tank Seams East of the Bear Canyon Fault. The four main seams in the Bear Canyon property are, the Tank seam, the Bear Canyon seam, Blind Canyon seam and Hiawatha seam. The applicant does not plan to mine the upper Bear Canyon seam due to the proximity of the seam to the Blind Canyon Seam (0.30 feet interburden). Nor do they plan to mine the Hiawatha Seam in Wild Horse Ridge due to the thinning of the seam. The mine plan, sequence and projected development for the Bear Canyon, Hiawatha and Tank seams are shown on Plate 3-4A, 3-4B and 3-4C respectively."

#### **Type and Method of Mining Operations**

In Section 3.4.1.2 the application says, "The mining at the Bear Canyon complex is done by continuous miners. The miners discharge into shuttle cars (diesel or electric) which carry the coal to a feeder breaker. The feeder breaker discharges the coal onto the belt conveyor where it is taken out of the mine." The mining methods are consistent with the proposed surface facilities expansion. If market conditions warrant, annual production will reach 1,100,000 tons per year.

#### **Facilities and Structures**

A list of new structures associated with the Wild Horse Ridge is given in Appendix 3A. The new structures are shown on Table 3A-1, in Appendix 3A. The new structures include a conveyor belt, substation, shop building, water tank and fuel tank. See the Support Facilities and Utility Installations section of this TA for more details.

### **Findings:**

Information provided in the amendment is adequate to meet the regulatory requirements for this section.

## **EXISTING STRUCTURES:**

Regulatory Reference: 30 CFR 784.12; R645-301-526.

### **Analysis:**

The application states that the only existing structure in the mineable portion of the permit area consists of a hunting lodge that exists in the Wild Horse Ridge area. The hunting cabin is shown on Plate 2-4G.

A road exists in the permit area that allows access for property owners and the Forest Service. That road is a permanent feature that will remain after mining.

### **Findings:**

Information provided in the amendment is adequate to meet the regulatory requirements for this section.

## **PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES**

Regulatory Reference: 30 CFR 784.17; R645-301-411.

### **Analysis:**

The Bear Creek Shelter is the only known cultural resource in the proposed addition to the permit area that is eligible for listing in the National Register of Historic Places. This site is not within the proposed disturbed area. In the lower part of the canyon in the vicinity of this shelter, the conveyor is on the other side of a ridge and the road is on the other side of the canyon. For these reasons, there is little likelihood for accidental disturbance.

The Division has received a letter from the State Historic Preservation Office concurring with the Division's determination that no historic properties would be affected based on avoidance of the Bear Creek Shelter.

### **Findings:**

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

## **RELOCATION OR USE OF PUBLIC ROADS**

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

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**OPERATION PLAN**

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**Analysis:**

No public roads exist in the Wild Horse Ridge area. However, the Bear Canyon haul road and the No. 3 Mine Access road are also used by customers of Sportsman's Hunting to access a hunting cabin that exists in the right fork of Bear Canyon. Hunters will use the road primarily from May to November, typically 2-3 times per week.

A road can be defined as a public road if there is more than incidental use by the public. The term incidental use is not defined but is left to the discretion of the Division. The Division considers the use of a road 2-3 times per week for seven months by a hunting club's members incidental because (1) the general public does not access the area because of the steep canyon slopes that limit recreational activities that can be accessed by the road, and (2) hunting club members will use the cabin less than 100 times per year.

**Findings:**

Information provided in the amendment is adequate to meet the regulatory requirements for this section.

**AIR POLLUTION CONTROL PLAN**

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244.

**Analysis:**

The regulations require the applicant to show its coordination efforts with the Division of Air Quality, and the application contains a copy of the Air Quality Approval Order.

**Findings:**

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

**COAL RECOVERY**

Regulatory Reference: 30 CFR 817.59; R645-301-522.

**Analysis:**

The applicant gave the Division a general commitment to maximize coal recovery. Most of the information in the resource recovery and protection plan (R2P2) is contained in the MRP. The applicant plans to mine the coal using room-and-pillar methods. The projected coal recovery rate is between 70% to 80% of the mineable coal. The Division reviewed the mine maps and other information in the application about coal recovery and found that the applicant is planning to maximize coal recovery.

Before the applicant can begin mining, the mining plan must be approved by the BLM. One item that the BLM reviewed is the maximum economic coal recovery plan. Thus, the coal recovery plan is reviewed by state and federal agencies., and those agencies must then concur with the Division's finding.

**Findings:**

Information provided in the amendment is adequate to meet the regulatory requirements for this section.

**SUBSIDENCE CONTROL PLAN**

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

**Analysis:**

**Renewable resources survey**

The applicant and the Division found that renewable resources exist within the Wild Horse Ridge mining unit. The Division is concerned that subsidence could: impact ground and surface water, create large subsidence cracks similar to those that occurred on the Bear Canyon Ridge, cause escarpment failure, and damage eagle nests. Since renewable resources were found in the area, the applicant is required to develop a subsidence control plan.

**Subsidence control plan**

- The applicant proposes to use room-and-pillar mining to extract all the coal in the Bear Canyon complex. The applicant expects to recover 75% of the coal in full extraction areas and 50% in first mining areas. The sequence and timing of mining is shown on the mine maps 3-4A, Blind Canyon Seam (lower), and 3-4C, Tank Seam (upper). No mining is scheduled for the Hiawatha Seam in the Wild Horse Ridge project. Subsidence should not occur in first mining only areas but should occur in areas where second mining (pillar recovery) occurs.
- The application shows the underground workings for the Blind Canyon Seam (lower) on Plate 3-4A and the Tank Seam (upper) on Plate 3-4C. Plate 3-3 shows the projected subsidence for the Wild Horse Ridge project. Plate 3-4A and Plate 3-4C show the projected subsidence for each seam.

Plate 3-3, Subsidence Map, shows the subsidence protection areas that include escapement areas. Plate 3-4C shows where pillars will be left as part of the subsidence protection zone.

- Mine maps in the application show where second mining (pillar recovery) will occur. Areas marked panel or development will be first mined only. Areas that will be second mined are identified as pillar and development.

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**OPERATION PLAN**

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- Descriptions of the physical conditions that affect the likelihood or extent of subsidence are addressed in the geologic section of the technical analysis.
- Section 5 of Appendix 3C describes the monitoring program. The applicant committed to installing 26 monitoring points in the Wild Horse Ridge area. The stations will be monitored yearly plus the applicant will conduct an annual on the ground survey to look for subsidence effects. The subsidence monitoring program is similar to the existing program that has proved to be adequate.
- The applicant proposes to protect sensitive surface features from subsidence by first mining only. The protected areas are marked on Plate 3-3. The pillars in the subsidence protection zones have safety factors of 1.5. The application quotes references that state subsidence should not occur if the pillar safety factor is at least 1.5. The reference is a NIOSH publication, and it is included in the application.
- The estimated amount of subsidence in the Blind Canyon Seam is 3.2 feet and subsidence in the Tank Seam is 4.1 feet. The maximum amount of subsidence in the Wild Horse Ridge area is 7.3 feet.
- The applicant described the measures that will be taken to mitigate or remedy any subsidence-related damage. The main item of concern is water replacement. The applicant committed to purchase either water rights to replace damaged water right or to repair damage to existing rights. Should subsidence cracks occur, the applicant will fill those cracks to the extent practical.

**Performance standards for subsidence control**

The applicant is required to meet the performance standards for subsidence control.

**Notification**

The applicant is required to meet the performance standards for subsidence control.

**Findings:**

Information provided in the amendment is adequate to meet the regulatory requirements for this section.

**SLIDES AND OTHER DAMAGE**

Regulatory Reference: 30 CFR Sec. 817.99; R645-301-515.

**Analysis:**

In case of a slide or other damage, the applicant committed to notify the Division by the fastest possible method. The applicant will repair the damage. If the applicant is unable to determine the best way

of repairing the damage, they will wait for the Division to recommend a repair plan.

**Findings:**

Information provided in the amendment is adequate to meet the regulatory requirements for this section.

**FISH AND WILDLIFE INFORMATION**

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

**Analysis:**

**Protection and enhancement plan**

Subsidence is not likely to adversely affect critical big game habitat, but the disturbed areas would be lost during the life of the mine. The applicant is required to use the best technology currently available to protect and enhance wildlife habitat. On March 13, 2001, a Division representative spoke with Chris Colt, (habitat biologist for the Division of Wildlife resources). They agreed that for this project only (the disturbance associated with the Wild Horse Ridge application), the mitigation at a ratio of three acres of enhanced habitat for each acre disturbed would not be required. The deer and elk in that area tend to winter and feed on the exposed ridge faces above the proposed disturbed area.

Because the surface disturbance would be in critical winter range, construction should not be started in the winter months from about November 1 until April 15. The applicant has committed to consult with the Division of Wildlife Resources prior to construction.

The application has been revised to contain more design information about the conveyor. Conveyors can inhibit big game movements, and although deer and elk are known to cross under conveyors, they usually need at least three feet of clearance. The most common deer and elk movements in the winter are along ridges, but there is some movement through canyon bottoms and up and down the sides of canyons. The conveyor has been designed to not overly restrict these movements providing a minimum of three feet of clearance.

**Endangered and threatened species**

The application says the applicant will work with the Division of Wildlife Resources prior to surface facilities construction to develop a mitigation plan for potential effects on raptors. As discussed below, the Division, Wildlife Resources, and the Fish and Wildlife Service have considered a few mitigation options.

On December 21, 1999, two Division representatives met with Chris Colt of the Division of Wildlife Resources and with the applicant's representative to discuss eagle nests in the area. It was decided nesting birds could be adversely affected if construction was begun during the nesting season and if any of the nearby nests was active. Therefore, construction should be started outside the nesting season, February 1-August 15, unless monitoring shows the nests are not active. If construction or mining has already begun when the nesting season starts, the birds would have the opportunity to judge whether they can accept the disturbance and nest or if they should go elsewhere.

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**OPERATION PLAN**

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The Fish and Wildlife Service recommended constructing two or three nearby alternate nests at least one-half mile from human disturbance areas. In a telephone conversation, a Wildlife Resources representative suggested a better alternative might be to do some habitat manipulation to increase the prey base, mainly jackrabbits and cottontail rabbits. This could be done in a degraded pinyon/juniper area and could be in conjunction with the mitigation for loss of big game habitat. A Fish and Wildlife Service representative agreed, again by telephone, that this would be an acceptable choice but suggested the applicant could do a combination of artificial nest sites and habitat manipulation. On March 6, 2001, Division representatives Susan White, Paul Baker, and Joe Helfrich met with Charles Reynolds from Co-Op Mining Co. and Chris Colt, habitat biologist for Wildlife Resources. Diana Whittington, ecologist for the U.S. Fish and Wildlife Service, was not present but, according to Mr. Colt, had concurred with Wildlife Resources regarding the development of a prey base study as mitigation to raptor displacement. Mr. Reynolds agreed to have a consultant prepare a proposal pending the development of the goals and objectives of the study by Mr. Colt. Once approved, the applicant needs to implement the plan.

The mine plan has been designed so no mining that would cause subsidence is planned for any areas under known raptor nests.

As discussed in the wildlife information section of this review, no proposed or listed threatened or endangered species is known to have habitat in the proposed addition to the permit area; however, the mine has potential, through water depletions, of adversely affecting four listed threatened and endangered fish species of the upper Colorado River drainage. The Fish and Wildlife Service requires mitigation when water depletions exceed 100 acre-feet annually. According to information in Section 3-3.6, the total estimated water requirements will be 0.05 cubic feet per second or 36.2 acre-feet annually. Therefore, no mitigation is required.

**Findings:**

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

**R645-301-333**, Use of the raptor nests near the proposed surface facilities will probably be adversely affected during the operations. The applicant has agreed to submit a proposal for a prey base study as mitigation for this loss. Once approved the applicant needs to implement the mitigation plan.

Water use by the mine may potentially adversely affect threatened and endangered fish of the upper Colorado River drainage, but since the depletion is less than 100 acre-feet, no mitigation is required. No other threatened or endangered species should be adversely affected by this development. The Fish and Wildlife Service has concurred with these findings.

**TOPSOIL AND SUBSOIL**

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

**Analysis:**

**Topsoil removal and storage**

Chapter 8, Soil Resources, Section 8.8, Removal, Storage and Protection of Soils, and Section 8.9, Selected Overburden Materials or Substitutes, and Appendix 3O, Wild Horse Ridge are all pertinent to the discussion of the plan for topsoil salvage and protection during operations of the proposed Wild Horse Ridge area. Five tables in the plan for the Wild Horse Ridge area are also key to the discussion of soil salvage activity:

Table 8.9-3 Summary Table  
Table 8.3-2, Soil Unit Acreage Within the Disturbed Area,  
Table 8.9-1, Reclamation Area Summary, and  
Table 8.11-1, Final Grading Test Sample Density.  
Table 3O-1, Summary of Cut and Fill Volumes

The Applicant considers the Summary Table 8.9-3 as being the most accurate table in the plan.<sup>2</sup> All other Tables must reconcile with this one. Table 8.3-2 divides recontour acres by soil type, with soils PC, WIN, WR, DON, DG, GP, DCP being located within the 3.6 acre Wild Horse Ridge disturbance. Table 8.9-1 divides recontoured areas by designated operational areas. Table 8.9-1 divides the recontoured areas by disturbed area. Tables which include disturbed acreage values all agree that the total disturbed acreage for Wild Horse Ridge is 3.6 acres.

This discussion of operational practices will cover the following topics:

- Topsoil and Subsoil Removal
- Topsoil Substitutes and Supplements
- Topsoil Storage

**Topsoil and Subsoil Removal**

*Topsoil Salvage Volumes*

Topsoil salvage areas are identified on the Soil Suitability Map C, Appendix 8-F, Order 1 Soil Survey. Cut and fill volumes are located in Table 3O-1 of Appendix 3-O, Wild Horse Ridge Blind Canyon Seam Pad and Conveyor Access Roads.

Table 3O-1 shows 8,700 CY of topsoil salvaged from the lower conveyor access road (1,669 CY), the upper conveyor access road (2,171 CY), and the Blind Canyon seam portal pad (4,860 CY). This soil will be stored in wooded area between the proposed lower conveyor access road and the right fork of Bear Creek as shown on Plate 8-7, WHR Topsoil Stockpile and Plate 7-1F, Hydrology Map.

Section 8.9.6 indicates that the soil below the stockpile (Doney soil, map unit D) could provide an additional 2,354 CY of topsoil during reclamation. This soil additional soil is included in the summary Table 8.9-3 as being available. Therefore, the sum total provided for Wild Horse Ridge in Table 8.9-3 (11,054 cubic yards) is 2,354 cubic yards more than that itemized in Table 3O-1.

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<sup>2</sup>Personal communication with Charles Reynolds during site visit 3/23/01.

However, there still is a discrepancy between the narrative on page 8-41 which indicates that a total of 8,539 cubic yards of topsoil will be recovered and Table 3O-1 which itemizes 8,700 cubic yards of topsoil.

Table 8.3-2 projects that approximately 11,049 CY of soil will be salvaged from all the Wild Horse Ridge area. The Division arrived at the 11,049 CY figure by multiplying the "acreage with topsoil recovered" column by the "estimated topsoil depth column" for soils with symbols PC, WIN, WR, DON, DG, GP, DCP (see Table below). This approximation of 11,049 includes the Doney soil which will be buried under the WHR topsoil pile. This approximation is within 5 yards of the 11,054 CY of topsoil stated in Table 8.9-3, the difference is probably due to rounding errors.

Wild Horse Ridge Topsoil Areas and Available Salvage Volumes					
Soil Map Unit	Estimated Salvage (inches)	Total Disturbance Acres	Potential Volume (yd <sup>3</sup> )	Projected Salvage Acres	Projected Volume (yd <sup>3</sup> )
PC	12	0.53	1,097	0.41	661
WIN	15	2.45	4,255	0.52	1,049
WR	10	0.72	968	0.50	670
DON	40	0.45	2,312	0.43	2,310
DG	30	1.71	7,058	1.44	5,808
GP	10	1.16	1,560	0.08	107
DCP	15	0.28	383	0.22	444
Total		7.30	17,633	3.60	11,049

In Table 8.9-1, reclamation areas for the Wild Horse Ridge are labeled TS-12, TS-13, TS-14, and TS-15. Table 8.9-1 itemizes the acreage to be reclaimed within each area and acreage to be graded within each of these areas. According to Table 8.9-1, areas TS-12 through TS-15 will add 7.3 acres of total area to the permit. All of the 7.3 acres will be reclaimed, however, only 3.6 acres will require recontouring during reclamation. The difference is due to:

1. The Wild Horse Ridge access road, 3.04 acres of which is pre-existing; and
2. The lower conveyor belt access road, 0.36 acres of which will not require grading during final reclamation; and
3. The upper conveyor belt access road, 0.3 acres of which will not require regrading during final reclamation.

Re-contour acres agree with projected soil salvage acres for Wild Horse Ridge. Table 8.9-1 shows re-contouring on 3.6 acres while Table 8.3-2 shows projected soil salvage over 3.6 acres.

The plan states that actual soil salvage depth and resulting volumes may vary according to actual conditions as they are encountered in the field during construction. State regulation R645-301-232.100 is specific in requiring that all topsoil be removed from the area to be disturbed. The plan states that Charles Reynolds or other supervisory personnel approved by the Division will be present during topsoil salvage to instruct equipment operators in the proper techniques of salvage and to ensure that required horizons are removed. Approved supervisory personnel will document topsoil salvage operations, including salvage history, soil salvage areas, soil salvage volumes, and soil placement in the stockpiles.

### *Subsoil Segregation and Soil Salvage Practices*

In several of the soil mapping units the topsoil is less than six inches. State regulations state that if topsoil is less than six inches, the operator may remove the topsoil and the unconsolidated materials immediately below the topsoil and treat the mixture as topsoil. Therefore, the Order I soil survey, Appendix 8-F, shows that topsoil salvage will include the topsoil and the horizon immediately below the topsoil, based upon rooting depth and other criteria established in the Order 1 soil survey soil salvage will be between 10 and 40 inches.

A single elevated report of selenium was noted in Guben-Pathead soil taken from a cutslope near the switchback of the existing Wild Horse Ridge Road. The site of the sample is shown on Map B in Appendix F as CW 10 (20 - 30 inches depth). The road to the No. Mine will be constructed from this in-place material: page 3-7 of the application states, "the road base material was analyzed.....none of the soil investigations revealed any acid- or toxic- forming materials." This statement is not entirely correct as high EC (10.2 mmhos/cm) and elevated selenium (0.26 mg/kg) were reported from 20 - 30 inches in the GP soil. The area of discussion is only 0.08 acres. The top ten inches of this soil will be salvaged and placed in the topsoil pile. The Division will allow the use of the subsoil as road base because of the very small acreage involved and because the level of selenium identified is within the limit of 0.3 ppm in upland ephemeral drainage as recommended in the soon to be published revised soil guidelines.<sup>3</sup>

### *Adverse Conditions*

Section 8.9.6, Wild Horse Ridge Disturbance, states that topsoil salvage will vary where bouldery material precludes accurate salvage of the specified depths. If bouldery surface areas and otherwise steep areas are accessible to construction machinery, then soils in these same areas are expected to be salvaged. Either steep, rocky surface slopes are safe for constructing cut slopes and likewise soil salvage, or they're not safe for either activity. Likewise, if steep, rocky slopes and extremely bouldery surface materials render themselves suitable for construction and as construction fill using conventional construction equipment, then these same areas and indigenous materials can be rendered suitable for topsoil salvage. Therefore, the plan states that topsoil will be salvaged from all areas accessible by equipment, including bouldery and steep slopes.

### *Rocks - Boulders and Large Stones*

Reference to Robert Davidson's discussion with Jim Nyenhuis (Nyenhuis 1997) concerning salvaging soils with higher rock content has been misrepresented in the Appendix 8-F, Section 2.5, Soil

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<sup>3</sup>Burton, Priscilla and Robert Davidson. 2001. Guidelines For Management of Topsoil and Overburden.. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining. This document has been reviewed by academics and regulatory personnel and will be published after review by industry representatives.

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Suitability for Salvage. The general idea is to salvage otherwise suitable soil containing indigenous amounts of rock that are typical within the soil salvage area. The main idea is that native soils with a higher intrinsic rock content than Division guidelines deem acceptable, offer a greater potential for reclamation success as follows:

1. Allow a greater potential for moisture infiltration into the interstitial soils.
2. Provide for a more stable reclaimed surface.
3. Provide additional surface cover in sparsely vegetated areas, thus helping protect against rain drop impact and resulting soil surface erosion.
4. Create wildlife habitat niches.
5. Create micro-climates for plant establishment and vegetation survival.

### **Topsoil Substitutes and Supplements**

Wild Horse Ridge topsoil pile is estimated as containing the 8,700 CY of salvaged soils and 2,354 CY of soil beneath the pile (in-place) for a total of 11,054 CY of soil. The native, undisturbed soil held in place will be demarcated by permeable fabric strips placed over the soil surface prior placing salvaged topsoil in the stockpile. Co-Op Mining has proposed using the additional 2,354 CY of topsoil held in place for other areas during reclamation; therefore, this soil is actually considered soil borrow.

### **Topsoil Storage**

The Section 8.9.6 states that the Wild Horse Ridge topsoil stockpile will be located in the lower section of the right fork of Bear Canyon in the area of soil map unit "DON" (Plate 8-1A). The topsoil stockpile is shown on Plate 2-4F in the lower convergence section between the primary No. 3 mine access roads and the primary conveyor access road No. 1.

The topsoil pile will be located adjacent to a catch basin which will be created in the ephemeral drainage. The topsoil pile itself will be approximately ten feet in elevation and 20 feet distant from the ephemeral drainage. The topsoil stockpile will be surrounded with a containment berm and protected as discussed in Section 8.8.1.3. Prior to stockpiling salvaged topsoil, permeable fabric strips will be placed over the original soil surface to preserve the location of the contact zone between the native topsoil and the stockpile.

Topsoil stockpile information concerning soil compaction and stockpile size and dimension is provided as follows:

- During topsoil pile construction, soil compaction will be minimized by limiting the extent of equipment traffic and affected area. Where compaction does occur, the compacted material will be ripped and loosened prior to seeding.
- The Wild Horse Ridge topsoil stockpile is detailed on Plate 8-7 which shows the projected stockpile, size, placement, final configuration and cross sections. According to Plate 8-7, typical slopes range from approximately 6:1 for east facing, 2:1 for west facing, 3:1 for north facing, and 2:1 for south facing.

- Appendix 3O, Figure 3O-1 and associated cross sections show the lower conveyor access road and topsoil stockpile. Cross sections showing the topsoil stockpile final configuration and resulting slopes correlate with Plate 8-7.

*Shower House Topsoil Stockpile*

Prior to construction on the shower house pad, topsoil was salvaged and stockpiled. The final topsoil stockpile consisted of 1200 cubic yards. The Wild Horse Ridge amendment states that Co-Op proposes to relocate this topsoil stockpile to the Wild Horse Ridge topsoil stockpile. Following relocation, As-builts will be submitted updating the MRP.

*Tank Seam Access Road Topsoil Stockpile*

Topsoil was salvaged and stockpiled from the Bear Canyon Mine Tank Seam access road during construction. Volume of topsoil contained in this stockpile is approximately 1000 cubic yards. During construction of the Wild Horse Ridge area, Co-Op proposes to relocate this topsoil stockpile from the upper storage pad to the Wild Horse Ridge topsoil stockpile. Following relocation, As-builts will be submitted updating the MRP.

*Topsoil Salvage and Stockpile Summary*

The plan summarizes (Table 8.9-3) available topsoil for the 36.4 acre Bear Canyon Mine site as follows:

<b>Topsoil Stockpile Description</b>	<b>Cubic Yards</b>
Main	1,480
Ball Park	3,400
Shower House Pad	1,200
Tank Seam Road	1,000
Wild Horse Ridge	11,054
<b>Total</b>	<b>18,134</b>

**Findings:**

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

**R645-301-231 and R645-301-120**, Please correct the narrative on page 8-41 (which indicates that a total of 8,539 cubic yards of topsoil will be recovered) to agree with Table 3O-1 which itemizes 8,700 cubic yards of topsoil.

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**VEGETATION**

Regulatory Reference: R645-301-330, -301-331, -301-332.

**Analysis:**

The current MRP says the applicant has maintained a commitment to reclaim the unused disturbed areas to the extent of the cover of the natural vegetation on the mine plan area, and Appendix 3G includes a plan for interim revegetation. The seed mixture in Table 3G-1 would be drilled or broadcast seeded followed by application of 1500-2000 pounds per acre of wood fiber hydromulch with a tackifier added. All but one of the species in the seed mix are native to the area, they are all adapted to the site, and they should provide good erosion protection.

In addition, the applicant commits to monitor interim revegetation sites for five years or until vegetation standards are met. Reseeding would be done if necessary.

**Findings:**

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

**ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES**

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

**Analysis:****Road classification system**

The roads associated with the Wild Horse Ridge project are all classified as primary roads. Those roads are the existing Wild Horse Ridge road, the extension of the Wild Horse Ridge road to the portal area and the two new conveyor access roads. Note the extension of the Wild Horse Ridge road is referred to in the application as the No. 3 Mine Portal Access Road, and the extension of the road to the portal area is called the No. 3 Mine Portals and Pad Area.

The No. 3 Mine Portal Access Road is an existing road 4,850 feet long. The road has an average grade of 10.5% with the steepest grade being 18%. The road existed prior to mining and will be retained for the postmining land use.

The conveyor access roads will provide access to the areas where the conveyor system will be built, operated and reclaimed. The lower road is approximately 600 feet long and has an average grade of 10%. The upper road is approximately 590 feet long and has an average grade of 19.5%. Those two roads will be reclaimed after mining is completed.

The Division has concerns about the steep grades. However, the Division does not have standards that require gentler grades. For road designs the Division relies heavily on the judgment of the engineer that designed and certified the roads.

The Division does not consider the No. 3 Mine Portals and Pad Area a road. The Division considers that area as a pad area. Therefore, detailed road designs are not required.

### **Plans and drawings**

Plate 3-5D and cross sections in Appendix 3-O show the road widths and drainages. The roads slope at 2% to ditches that parallel the roads to direct runoff. The cross sections are on 100 foot centers and show cut and fill requirements for both construction and reclamation. The Division will use that information for bond calculations.

In Appendix 3-O the applicant shows a detailed plan for the construction and reclamation of the roads. In Section 3.6.12 of the amendment the applicant gives a detailed reclamation plan for the roads in the Wild Horse Ridge site. Since no material will be down cast, all fill material will either be hauled back to the site or excavated from the fill areas. Because the native material contains large boulders (3' to 5' in diameter), the lifts will be a maximum of 36". The fill will be compacted with earthmoving equipment. The applicant and its consultant do not believe conventional compaction equipment will work at the site. Therefore, compaction will be done with earth moving equipment.

The Division recommends that the applicant use a maximum lift thickness of 8". The Division is concerned that inadequately compacted slopes could fail. Since the Division does not have any standards that apply directly to lift thickness and the designs have been certified by a licensed professional engineer the Division will not require the applicant to change the maximum lift thickness.

The designs for the main haul road in the No. 3 Mine Portals and Pad Area are in Appendix 3-O. The applicant will reclaim most of the cut slopes. Since some cut slopes do exist in the area, total elimination of cut slopes may not be possible.

### **Performance standards**

The roads will be constructed of in-place material and/or road base. Similar material was used to construct other mine roads and has been adequate.

The applicant committed to repair road damage caused by a catastrophic event as soon as practical. In addition to the above, primary roads will meet the following requirements:

- Primary No.3 Mine Access Road is the main road to the portal area. Certified maps showing the road are Plate 3-5D Road-Details and Plate 2-4G, 2-4F Surface Facilities.
- Primary Conveyor Access Road No.1 is the lower conveyor access road and is shown on Plate 3-5D Road-Details and Plate 2-4F Surface Facilities.
- Primary Conveyor Access Road No.2 is the upper conveyor access road and is shown on Plate 3-5D Road-Details and Plate 2-4G Surface Facilities.
- The cross sections on Plate 3-5D show the road width and drainage. The roads slope at 2% slope and have parallel ditches that direct runoff. The cross sections Attachment 2 of Appendix 3-O show cuts and fills. The Division will use those cross

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section to determine reclaimability, which will be discussed in the reclamation section of this technical analysis.

- Appendix 3-O-6 contains the slope stability study conducted by Dames & Moore. The consultant outlined the soil and rock sampling, procedures and testing. The stability analysis was described. All slopes had a minimum safety factor of 1.6, and the minimum required safety factor is 1.3.
- Most of Primary No.3 Mine Access Road will be constructed on an existing dirt road. By upgrading the existing dirt road the applicant will be minimizing erosion. Since the roads must be constructed in a narrow canyon, the applicant has limited options about where to place the road. The Division reviewed the road designs and concluded that the erosion will be minimized and that the roads are located on the most stable available surface.
- The applicant does not propose to construct fords in any perennial or intermittent streams.

**Primary road certification**

All primary road designs have been properly certified.

**Other Transportation Facilities**

The conveyor system goes from the coal bin near the portals to the tipple facilities then to the coal storage pad. The conveyor system will be enclosed for fugitive coal dust. The R645 rules have few design specifications for conveyor systems. The Division reviewed the conveyor plans and found that they meet the minimum engineering requirements. See Appendix 7K Page13 for information of dust control.

**Findings:**

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

**SPOIL AND WASTE MATERIALS**

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; 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:****Disposal of noncoal waste**

Noncoal waste will be placed in metal dumpsters that are on the property. A local trash collector will remove and replace the bins when they are near capacity. This is standard procedure for most coal mines.

### **Coal mine waste**

Coal mine waste will be temporarily stored at the designated storage site shown on Plate 2-4C. The material will not be stored at that site for more than 15 days. The applicant will record when the material is placed and removed from the storage site. Permanent storage of the coal waste material will be either underground or at the Hiawatha mine. Coal mine waste sent to the Hiawatha will be placed in Refuse Pile # 1.

The Division does not have regulations that deal with temporary storage sites. At other mines, the Division requires a statement of the maximum amount of coal mine waste that will be stored at the temporary site at any time, a commitment to test for acid and toxic properties prior to shipping the material off site, and a sediment control plan for the material.

Note: the Division has not yet received an amendment from the Hiawatha mine to accept coal mine waste from the Bear Canyon Mine. See R645-301-536.510.

### **Refuse piles**

The applicant does not propose to construct a refuse pile. All refuse (coal mine waste) will be disposed of underground or at the Hiawatha Mine.

### **Impounding structures**

The applicant does not propose constructing any impoundments out of coal mine waste.

### **Burning and burned waste utilization**

The applicant did not address burning and burned waste utilization. See R645-301-528.323

### **Return of coal processing waste to abandoned underground workings**

The applicant has approval for disposing of coal mine waste underground. The plan is mainly for small amounts of roof material.

### **Excess spoil**

The applicant does not plan on generating any excess spoil.

### **Findings:**

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

**R645-301-528.323.1**, The applicant must address how burning and burned waste material will be handled. Note: R645-301-528.323.1 does not make exceptions for temporary storage piles.

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**R645-301-536.510**, Before the Division can allow coal mine waste to be shipped to the Hiawatha mine site the MRP for the Hiawatha mine site must be modified to allow coal mine waste from Bear Canyon to be sent to the Hiawatha mine.

**R645-301-536 and R645-301-521.190**, The applicant must state in the MRP the maximum amount of coal mine waste that will be stored in the temporary waste site at any given time, must develop a plan to have the material tested for acid and toxic properties before the coal mine waste is shipped to the Hiawatha Mine, and must develop a sediment containment plan for the material.

## **HYDROLOGIC INFORMATION**

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -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:**

#### **Ground-water monitoring**

The plan references a recommended water monitoring plan, included in Appendix 7-J, section 10.0. The proposed monitoring plan is contained in section 7.1.7.

One flow measurement was obtained at springs WHR-7 and WHR-8. No information was provided for WHR-9. The plan indicates that these springs will not be monitored because WHR-4 will represent these springs. Site WHR-7 was estimated to be approximately 400 ft above the Tank Seam while WHR-9 and WHR-8 are close to drill logs showing no coal.

The PHC, Appendix 7-J, includes a discussion in the subsidence section on multiple coal seam removal. Mining the Tank (upper) and Blind Canyon (lower) seams in other sections of permit area has seen cracking extend upward no more than 250 feet above the Blind Canyon Seam. The surface fractures extend down about 100 feet. Average overburden for the Tank Seam is 950 feet while for the Blind Canyon Seam it's 1200 feet. Total subsidence for the two seams has been calculated to be 7.3 feet. Reference Table 3C-1. However, springs having significant discharge within the Wild Horse Ridge area are separated from the Tank Seam by 1000 feet. Thus, the PHC states, the potential for mining to impact these springs appears to be minimal. Given the surface fracturing, the possibility exists that surface recharge to the springs could be affected, one way or the other.

The PHC indicates it is unknown whether water may be encountered along the Bear Canyon Fault from the east, but that this water is suspected to have antiquity. The well closest the fault, MW-117, will be monitored in conjunction with MW-114, as these wells would most likely show effects if waters with antiquity do discharge to the fault should it be encountered during mining.

### **Surface-water monitoring**

The Upper Right Fork Bear Creek, BC-4, above the proposed disturbed area, has been added to the monitoring plan. Surface water monitoring at the Left Fork of Fish Creek, FC-1 and McCadden Hollow, MH-1, were added to the monitoring plan.

### **Acid and toxic-forming materials**

Information is contained in Appendix 6-C of the MRP. According to the PHC, strata in the proposed permit area is expected to be identical to the existing permit area. Acid from pyrite oxidation is readily consumed by dissolution of carbonate minerals available in the mine area.

### **Transfer of wells**

No discussion on transfer of wells in the new permit area is provided. It is assumed all wells will be properly abandoned when no longer needed for mining.

### **Discharges into an underground mine**

It was estimated that 0.05 cfs water will be required for mining associated with the Wild Horse Ridge. A Water line from #1 mine to the #3 and #4 mine is located along the conveyor. This water is to be used for a bath-house, drinking water and for spray; on the working face, at coal belt heads, at transfer points and at the tipple for dust suppression. Page 7-56 indicates, "No water will be discharged into the mine during or following reclamation".

### **Gravity discharges**

No gravity discharges are expected for the Wild Horse Ridge mines, Bear Canyon No. 3 or No. 4 (reference page 7-56).

### **Water quality standards and effluent limitations**

Water quality standards and effluent limitations must be conducted according to State Standards and the approved UPDES permit. A copy of the current permit, which includes a discharge point for Pond D is included in Appendix 7-B.

### **Diversions**

Diversion designs are provided for the 10 year- 6 hour event. The applicant committed to maintain the minimum required cross sectional area. Freeboard was presented to be 0.30 ft to 0.48 ft. Standard engineering practices generally use a minimum of 0.3 ft so this is acceptable. Along the roads, additional culverted cross drains may be advantageous in meeting the ditch requirements without requiring changes in the road surface slope.

The culvert containing Bear Creek for the road to get to the new addition has been designed to meet the 100-year 6-hour storm. This is described in Appendix 7-G. This is the appropriate design storm.

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*Road Drainage*

The applicant should consider placing a culvert at the approximate location of label D-21U on Plate 7-1 F. The primary road retains this drainage along the in slope for a significant distance in this region. Also, the slope breaks from a steep section to a low gradient area at this location which may result in maintenance problems due to sediment settling out in the ditch.

**Stream buffer zones**

Construction in the buffer zone will be necessary to build the roads and portal in the east fork of Bear Creek. Map 2-4 shows Buffer Zone markers all along the access road, along the conveyor belt roads, and along the lower edges of the topsoil storage piles. The diversion channels and culverts have been properly designed according to the appropriate sections of the regulations. Several safeguards have been included to prevent adverse impacts to the stream. These include sediment control with silt fences, berms around the topsoil storage piles, enclosure of the conveyor system, sediment traps to catch coal fines, Alternate Sediment Control Areas, a berm around the fuel tank, and Sediment Pond D at the portal. These measures are expected to prevent violation of water quality standards and prevent mining operations from adversely affecting the stream.

An approved Stream Alteration Permit obtained from the State Division of Water Rights for the proposed several stream channel alterations will need to be provided when it's received. The permit amendment cannot be approved without this approval. Appendix 7-O contains the completed application for the permit, but not the approved permit.

**Sediment control measures***Construction - Sediment Control Methods*

A berm will be created on the downslope side of a cut. Road cuts will be made into the slope rather than parallel to the slope. Blasts will be designed to drop material into the cut area behind the berm, pg. 30-3. The blasting methods used here will be the same as have proven successful in constructing the other roads in the permit area. Along the Blind Canyon Seam Portal Pad temporary and permanent silt fences will be placed to treat all runoff from the disturbed area not contained by a berm. Fences will remain in place until all runoff is directed to the sedimentation pond and erosion control matting will be used on the out slope of the Blind Canyon Seam Portal pad fill, pg. 30-5. The Applicant has committed to install the erosion control matting in strict conformance with the manufacturers instructions.

Discussions related to culvert placement and pad and operational construction in the drainages are detailed. The applicant states that, "Following initial pad contouring the sediment pond will be constructed followed by road crowning and ditch and culvert placement." pg. 30-6. More construction detail is contained on pages 30-2 through 5. Culverts will first be placed in the ephemeral drainages at each crossing to separate disturbed and undisturbed drainages in the event of storms during construction. Also, that way the catch basins will not receive runoff from undisturbed drainages. Special care is to be taken at a "small riparian area.....adjacent to this road". This is above the spring designated SBC-14, (WHR-6) which is a unique area. A site visit by the Division evaluation team followed by discussions with the Applicant resulted in a commitment (pg.30-5) that the Division Hydrologist will be notified in time to make a field visit when the blasting is to occur above this spring, SBC-14, (WHR-6) and when construction for the culvert above this spring is to take place.

### *Operational - Sediment Control Methods*

Sediment control measures include using a sedimentation pond and BTCA erosion control areas "V" and "W". The BTCA area "V" includes the out slope along the conveyor access road and the Blind Canyon portal pad out slope area. These areas are mapped on Plate 7-1G. Erosion control matting will be used on the out slope and a berm will be placed on the outside edge to prevent water from flowing onto the slopes.

BTCA areas "W" include the conveyor belt areas. A silt fence will be placed down slope during construction and be evaluated for removal following construction. During operations, coal fines will be captured in a metal pan below the belt and will be cleaned off the pan. A dust cover will be placed over the belt to prevent fine coal wind transport. Details of the conveyor belt are presented in Figure 7K-1, Typical Conveyor Pan Structure. These appear to be reasonable measures to minimize the amount of coal fines leaving the conveyor belt.

In the lowest belt area, the pan will be cleaned with water draining to disturbed area ditch D-3D, which reports to the lower area sediment pond. The two upper conveyor belt areas will report to two catch basins, No. 1 and 2. The Wild Horse Ridge Coal Storage Bin area also reports to catch basin No. 2. These catch basins were included at the request of the Division to provide additional control of possible coal fines coming from the conveyor system. These areas are mapped on Plates 7-1C, 7-1F and 7-1G. The designs, calculations and certification for these basins are provided in Appendix 7-K. Capacity was based on a 10 year 6hr storm peak. Catch basins will be inspected and cleaned as necessary to maintain capacity. Both of the catch basins have an outlet spillway, so flow from the basin is controlled under situations that exceed the storage volume. These are detailed in Figures 7K -3 and -4. The spillways are provided with riprap-linings.

#### **Siltation structures.**

See: Sedimentation Ponds.

#### **Sedimentation ponds.**

The proposed Wild Horse Ridge area includes designs for sedimentation pond 'D'. This pond is considered temporary since it will be removed upon final reclamation. All runoff from the portal pad area will report to this pond. Pond D has a maximum storage capacity of 4,113 cubic feet (0.094 acre-feet), storage capacity above the decant. The height of the pond from the bottom of the pond to the top of the embankment is 7.5 feet. Therefore, it does not qualify as an MSHA pond. The pond was designed to the appropriate 10-year, 24-hour storm event using runoff curves of 90, which is appropriate for the pad area and rocky drainage area leading to the pond. The pond is designed to store the full volume of the design storm. Reference Table 7.2-15, and Plate 7-11.

The sedimentation pond must maintain adequate sediment storage capacity. The proposed clean out level of 60% meets this requirement. Reference Section 7.2.8.4 and Plate 7-11, Sediment Pond "D". At pond 'D', the decant structure is located above the 60% clean out level. The clean out elevation is 0.55 ft below the decant elevation. A Decant Structure Detail is included with the oil skimmer end in the pond and a control valve for sampling and draining at the downstream end.

A single open channel spillway is proposed for discharge from the pond. The spillway is appropriately designed using a 25-year, 6-hour design event and the spillway is lined with riprap. The D-50

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rock size is six inches and appears appropriately designed. A fuel tank is located about 100 feet away from this pond. Plate 2-4 shows a containment berm should the tank leak. This berm, and its design, are to be part of the SPCC plan which will be completed within six months after construction is completed. Full containment berms around fuel tanks are standard on the rest of the site, and will be included for this one.

Based on the letter accompanying the latest submittal, it's expected that the SPCC plan will be updated and available at the site "within six months of implementation of the Wild Horse Ridge construction". A determination will then be made as to whether the proposed plan minimizes potential for hydrocarbons to be released off the permit area. This needs to be included in the plan when it's finished.

Dames and Moore conducted a stability analysis for the Portal Staging Area sedimentation pond, July 23, 1999. This analysis for steady state seepage assumes a 7 foot deep pond is full and two seepage conditions exist: 1) A straight line condition through the fill, and 2) Seepage controlled by the native sandstone and colluvium interface. Results suggest during a pseudo-static loading condition, shallow surface slide and sloughing from the structural fill and native slopes could be expected with strong ground movement. Proposed embankments have a minimum safety factor of 1.46.

The Dames and Moore report for July 23, 1999 did not address if the pond would be stable under rapid drawdown condition. Note: rapid drawdown failure occurs when pore pressure in the embankment is not countered by water pressure because the pond was rapidly drained.

**Other treatment facilities**

No "other treatment facilities" are proposed.

**Exemptions for siltation structures**

No exemption from siltation structures is proposed.

**Discharge structures**

Discharge structures are designed to minimize erosion.

**Impoundments**

See the section on Sedimentation Ponds.

**Casing and sealing of wells**

No changes to the casing and sealing of wells is proposed. The existing plan is assumed to be adequate to handle this regulatory requirement.

**Findings:**

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

**R645-301-742.312.4**, An approved Stream Alteration Permit obtained from the State Division of Water Rights for the proposed several stream channel alterations will need to be provided when it is received.

**R645-301-553.300**, The applicant must show that Pond D will be stable under rapid drawdown conditions. Note: Failure during rapid drawdown occurs when pore pressure in the embankment is not countered by the water, not erosion. The Division has a computer program that they will let the applicant have access to that calculates safety factors for rapid drawdown conditions.

## SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

### Analysis:

The applicant lists the existing and proposed structures at the Bear Canyon Mine in Appendix 3A, Table 3A-1. The new facilities include (1) Wild Horse Ridge conveyer belts, (2) Wild Horse Ridge substation, (3) Wild Horse Ridge shop, and (4) Wild Horse Ridge water and fuel tanks. The new facilities are shown on Plate 2-4. More structures are shown on Plate 2-4 than are listed in Appendix 3A. These include the following:

- Portal Fan
- Coal Storage Bin
- Power Lines
- Water Lines

Table 3A-1 should include all new surface facilities that will be constructed.

### Findings:

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

**R645-301-526.210**, The applicant needs to list all structures that are to be built as part of the Wild Horse Ridge project including the portal fan, the coal storage bin, power lines, and water lines.

## SIGNS AND MARKERS

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

### Analysis:

R645-301-521.200 requires that the applicant post (1) mine and permit identification signs, (2) perimeter markers signs and (3) topsoil marker signs. The applicant committed to place those signs as

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required. The Division's inspectors routinely check the site for signs and markers. Should a problem occur, the Division will deal with it during a routine inspection.

**Findings:**

Information provided in the amendment is adequate to meet the regulatory requirements for this section.

**USE OF EXPLOSIVES**

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

**Analysis:**

A blast design is submitted as Appendix 3-M which describes a blasting plan for the construction of the conveyor access roads associated with the Wild Horse Ridge addition which will comprise the Bear Canyon #3 and #4 Mines. The anticipated blasting plan has been prepared and signed by Mr. Kevin Petersen, who is known to have a current surface blasting certificate through the State of Utah.

The plan clearly indicates that there are no active or abandoned underground coal mines, dwellings or public buildings within the radial distances described within R645-301-524.211 and -524.212. The response clearly states that there are no active or abandoned underground coal mines within 500 feet of the proposed Wild Horse Ridge blasting area. A hunting cabin is about 750 feet from the proposed blasting area, but it is not used as a dwelling, public building, school, church, or community or institutional building as discussed in R645-301-524.211. No other buildings exist within 1,000 feet of the proposed Wild Horse Ridge blasting areas. Although the applicant's response does contain an anticipated blast design, it was not necessary to submit one. Regulations R645-301-524.210 through -524.212 have been adequately addressed. The anticipated blast design which has been submitted appears to be able to successfully meet the fragmentation requirements being sought without incurring significant damage to the surrounding environment.

The applicant's response provides the following information to address deficiencies aired in the initial response:

- 1) A drawing that shows the burden, spacing and depth of boreholes for the bench type blasting to be used for bedrock removal (establishment of road grade) has been provided. A verbal description of the method to be used for boulder breakage has also been provided.
- 2) Page 3M-3 of the revised blasting plan clearly states that satchel type directional charges will not be used in order to minimize air blast and fly-rock. A description of the explosive to be used (Irecoal D 378), is not a satchel type directional charge.
- 3) Borehole sizes have been revised from 1¼ inch diameter to 1½ inch diameter. Although the dynamite cartridges will now fit in the boreholes, 1 3/8 inch diameter boreholes would probably provide better breakage and improve on the tampability of the explosive in the boreholes.

- 4) The revised blast design has more than doubled the weight of explosive which will be used per borehole. They will be using 1.3 pounds per hole, with a maximum of ten holes per round, hence a maximum of 13 pounds of explosive will be used per round. This improves the powder factor significantly in the anticipated blast design. The ability to adjust fragmentation within the round is within the jurisdiction of the certified blaster performing the work, and it is not necessary to obtain Division approval for minor changes in powder factor.

**Findings:**

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

**MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS**

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

**Analysis:**

**Affected area maps**

Several maps show the permit boundaries and proposed mining areas. Those maps are considered adequate to serve as the affected area map.

**Mining facilities maps**

Plate 2-4G and other maps show the mining facilities.

**Mine workings maps**

The mine maps for the two seams in the Wild Horse Ridge project are Plate 3-4A Bear Canyon seam (lower) and Plate 3-4C Tank seam (upper).

**Monitoring and sample location maps**

**Findings:**

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

# RECLAMATION PLAN

## GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; 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:

Terracing as a reclamation method is described on page 3-75. The areas proposed to be terraced are shown on the reclamation map. Although terracing may be appropriate in some locations it is found to be less effective than simple slope changes in many locations in Utah. Slope form or slope brakes that decrease the gradient and retain the overland flow are best technology available for erosion control. In steep sections slope faces steepened at the top and concave toward the base integrated with low angle slopes are known to be successful.

The plan states "Since a cut slope existed along portions of this area prior to mining there may not be enough material to completely eliminate the entire cut. In areas where cuts existed prior to mining, the (fill) material will be placed so as to backfill the cut to the extent possible. These areas are shown on Plates 3-2", (pg. 3-119). These areas are on the upper side of the roads that were constructed before mining and these same roads will be left after mining. Typically the cuts are 15 to 20 feet high with the maximum at one location of 30 feet. Such cut slopes are typical of early roads constructed in the area. Since the area is exposed bedrock, no impact has been noted nor is any anticipated.

Portals will be sealed with backfill beginning at the Blind Canyon portal and backfilling the cut slope as it is excavated from down slope side. A narrow access road will be retained for topsoil access. Topsoil will be placed on excavated areas and then the access road will be reclaimed (3-117 to 3-118). The amendment clarifies the reclamation for the Wild Horse Ridge Blind Canyon portal is separate from the portal west of Bear Creek.

### Findings:

The application meets the minimum regulatory requirements for this section.

## POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

### Analysis:

The applicant has proposed no changes to the postmining land use, and information in the current MRP is considered adequate.

**Findings:**

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

**PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES**

Regulatory Reference: 30 CFR Sec. 817.97; R645-301-333, -301-342, -301-358.

**Analysis:**

Under the proposed reclamation plan and the success standards associated with this plan, wildlife habitat would be restored to approximately its current condition. The Division does not consider artificial habitat structures, watering devices, or similar features to be needed. The primary limiting factors for wildlife in this area are forage and cover which would both be restored to approximately premining conditions at reclamation.

**Findings:**

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

**APPROXIMATE ORIGINAL CONTOUR RESTORATION**

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; 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 requirements for restoring a site to the approximate original contour (AOC) are couched in the backfilling and grading regulations. The only regulation that specially mentions AOC requirements is R645-301-553.110 that states the following:

Achieve the approximate original contour (AOC), except as provided in R645-301-553.500 through R645-301-553.540 (previously mined areas (PMA's), continuously mined areas (CMA's) and areas subject to the AOC provisions), R645-301-553.600 through R645-301-553.612 (PMA's and CMA's), R645-302-270 (non-mountaintop removal on steep slopes), R645-302-220 (mountaintop removal mining), R645-301-553.700 (thin overburden) and R645-301-553.800 (thick overburden);

Since the Wild Horse Ridge site is a post-SMCRA underground site the applicant must show that the AOC requirements can be met. Even if an AOC variance is granted the applicant must show that the site can be restored to AOC standards.

The Division's technical directive Tech-002 gives additional AOC guidelines. That guideline was also used to evaluate the Wild Horse Ridge site for AOC compliance.

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**RECLAMATION PLAN**

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Except as specifically exempted, all disturbed areas shall be returned to the approximate original contour. The final surface configuration shall closely resemble the general surface configuration of the land prior to mining. To evaluate compliance with this requirement, the term "surface configuration" must be clarified. Surface configuration refers to the premining and postmining topography of the mine site and surrounding area.

The term AOC does not mean that the land is restored to the original contours. Elevation of the premining and postmining site should only play a minor role if any in evaluating AOC.

The main criteria should be whether the postmining topography, excluding elevation, closely resemble the premining configuration. The Division evaluates premining and postmining topography on slope length and angle, and whether restoring the site to the original contours would violate other rules.

In some cases the applicant cannot restore the site to the premining contours without violating other regulations, such as slope stability and erosion. Many of the natural slopes in the area are at the angle-of-repose. By definition when a slope is at its angle-of-repose the safety factor is 1.0. The minimum safety factor for reclaimed slopes is 1.3. If all slopes were returned to the premining conditions, the safety factor requirement could not be met.

When the natural slope has a safety factor less than 1.3, the applicant usually opts to reduce the slope angle by either extending the toe or decreasing the height. Extending the slope's toe may block the drainage which violates other regulations. If the applicant decreases the slope height then a cut slope will be left.

The premining and postmining cross sections for the Wild Horse Ridge project are in Appendix 3 O and are divided into the (1) Lower Conveyor Access Road; (2) Upper Conveyor Access Road; and (3) Mine Portal Area. The applicant proposes to restore most of the site to the premining contours. However, some cut slopes will be left.

Post-SMCRA cut slopes do not have to be fully reclaimed, because they are not highwalls (portal face up areas). The Division does not have standards or regulations that deal with retention of cut slopes. The Division does allow cut slopes to be left after reclamation if they are stable and do not substantially increase the potential for safety or environmental problems.

The applicant will backfill the site to the premining elevations whenever possible. In most cases the cut slopes will be in solid rock. The Division's staff reviewed the cross section in Appendix 3 O and found that the reclaimed slopes resemble the slopes in the surrounding area.

Under AOC guidelines all spoil piles must be eliminated. The applicant claims that no spoil (excess material) will be generated from the Wild Horse Ridge project.

The applicant committed to reclaim all highwalls. The premining and postmining contour maps suggest that all highwalls will be eliminated. In the past, questions about highwall boundaries have been raised regarding highwall elimination. To avoid future problems the applicant must give the Division detailed cross sections for each highwall that show the premining, operational, and postmining contours, and highwall boundaries.

The AOC guidelines require that the restored drainages complement the surrounding natural drainages. The Division considers this requirement to be met if all the hydrologic regulations have been satisfied.

The AOC guidelines require that the reclaimed topography be compatible with the postmining land use, alternative postmining land use or a variance from the AOC requirements be granted. The applicant did not ask for an AOC variance. The Division considers those to be met if all postmining regulations have been satisfied.

### **Findings:**

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

**R645-301-521.190, R645-301-542.300 and R645-301-553.120**, The applicant must give the Division a cross section for all highwalls that show the premining, operational, and postmining topography and the highwall boundaries.

## **BACKFILLING AND GRADING**

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

### **Analysis:**

The general backfilling and grading requirements are (1) achieve the approximate original contour; (2) eliminate all highwalls, spoil piles and depressions; (3) achieve a postmining slope that does not exceed the angle of repose or such lesser slopes as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides; (4) minimize erosion and water pollution both on and off site; and (5) support the approved postmining land use. The AOC, highwall elimination, erosion and water pollution, and postmining land use requirements have all been discussed in the AOC section of this technical analysis; refer to that section for more details.

The applicant does not plan to produce any spoil material at the Bear Canyon Mine including the Wild Horse Ridge project. The postmining contour maps show that no depression will be left after final reclamation.

A Dames and Moore study investigated the slope stability for the reclaimed slopes. The information in the reports shows that all reclaimed slopes will meet or exceed the minimum safety factor requirements. The Division reviewed the report and found that it met the minimum requirements for slope stability studies.

The backfilling and grading requirements have some specific requirements. The only such requirement relative to the Wild Horse Ridge project is that all coal seams be backfilled and adequately covered. All coal seams at the Wild Horse Ridge site will be covered and backfilled.

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**RECLAMATION PLAN**

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**Findings:**

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

**MINE OPENINGS**

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

**Analysis:**

The mine opening closure plan is given in Section 3.6.3.1 of the approved MRP. The plan is adequate for the mine openings at the Wild Horse Ridge.

**Findings:**

The amendment meets the minimum requirements of this section.

**TOPSOIL AND SUBSOIL**

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

**Analysis:**

Chapter 8, Soil Resources, Section 8.10, Redistribution of Soils, and Section 8.11, Nutrients and Soil Amendments, discuss the soil reclamation plan for the proposed Wild Horse Ridge area. The information is reviewed in this order:

- Soil Redistribution
- Soil Nutrients and Amendments
- Soil Stabilization

**Soil Redistribution**

Based on the 3.6 re-contoured acres (Table 8.3-2) and the 8700 CY of soil salvage (Table 3O-1), the average topsoil replacement thickness for the Wild Horse Ridge disturbed area should be 18 inches.

The MRP divides the mining area up into different reclamation areas. The Wild Horse Ridge area is divided up into areas TS-12, TS-13, TS-14, and TS-15 as follows:

*TS-12, Wild Horse Ridge Access Road*

The Wild Horse Ridge Access Road already exists and provides access to a hunting lodge located further up the hillside. After mining, this road will remain and continue providing access to the hunting

ledge. During upgrading and widening of the road during mining, topsoil will be recovered (15 inch depth) from isolated areas of new additional disturbance (0.22 acres). During reclamation, salvaged soils will be redistributed to the same additional disturbed areas (0.22 acres) of the road at the same depth (15 inches).

*TS-13, Conveyor Belt Access Road/ Topsoil Stockpile Area*

The plan states that following re-contouring of this area at the time of final reclamation, topsoil recovered prior to construction will be redistributed to obtain an approximate depth of 13 to 14 inches. Soil salvage ranges from 12 inches on the slopes in the upper portions of the road to 40 inches from lower portions of the road. The plan states that 2,054 cubic yards of topsoil from this area may be utilized in other areas of the mine site.

*TS-14, Upper Conveyor belt/Access Road*

The upper conveyor belt/access road will have 10 to 30 inches of topsoil recovered. Topsoil redistribution will be performed in conjunction with regrading due to the remoteness of the site and the reclamation procedures of this area. The plan states that topsoil recovered from this area will be redistributed at an average depth of 13 to 14 inches.

*TS-15, WHR Blind Canyon Seam Portal*

This area will have 10 to 30 inches of topsoil salvaged for reclamation. Topsoil redistribution will be performed in conjunction with regrading due to the remoteness of the site and the reclamation procedures of this area. The plan states that topsoil recovered from this area will be redistributed at an average depth of 13 to 14 inches.

### **Soil Nutrients and Amendments**

Section 8.11, Nutrients and Amendments, states that following final grading, each of the reclamation areas will be sampled (see Table 8.11-1 for Sample Density) and the collected soil samples analyzed. The plan states that additional samples will be taken in the event that the initial sample indicates unsuitable material. Composite samples will be taken from 0 to 2 feet and from 2 to 4 feet at each sample location. The section concludes that all necessary fertilization and chemical treatments will be applied according to the results of the soil sampling and analysis program approved by the Division. In addition to analyzing the samples for micro nutrients, analyses will also include standard fertility test for pH, EC, nitrogen, phosphorus, and potassium. All sampling, testing and result interpretation will be done by a qualified soil scientist. The soil scientist will be qualified to sample, test and interpret data results. Prior to sampling and testing of the topsoil material, the soil scientist's qualifications will be reviewed by the Division.

### **Soil Stabilization**

Following backfilling and regrading, the re-graded surface will be scarified by a ripper to a depth of 14 inches to help reduce surface compaction, provide a roughened surface to help topsoil adherence, and help promote root penetration. Steep slope areas will be roughened by ripping to create ledges, crevices, pockets, and screes (talus slopes at the base of cliffs) to allow better soil retention and vegetation establishment.

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To minimize compaction of replaced topsoil, travel on reclaimed areas will not be allowed. Co-Op will guard against erosion by using mulch, tackifier, and erosion control matting. Topsoil will be redistributed in the fall of the year to help promote vegetation establishment. In all cases, a very rough seed bed will be prepared.

**Findings:**

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

**ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES**

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

**Analysis:****Reclamation**

In Section 3.6.12 of the Wild Horse Ridge amendment, the applicant states that the portal pad access road will be backfilled. As fill material is placed on the access road, it will result in narrowing the road width, while backfilling the cut slope. Large diameter rocks will be incorporated into the out slope created by filling to aid in surface stability. This procedure will be followed until most of the cuts are backfilled and the road has been narrowed to a "pilot cut" which will still allow the equipment access to the area. The pilot cut will then be reclaimed in the same manner as the Tank Seam Access Road described in Section 3.6.11.

In Section 3.6.3.3, the application says:

The mine access road below the No. 3 Mine Access Road will be regraded and fitted with post-mining diversion structures as shown on Plate 3-2. Diversion designs are shown in Appendix 7-H. Asphalt road surfacing material from the scalehouse pad will be excavated and disposed of at the Nielson Construction Landfill in Emery County. All roads that are to be reclaimed will be closed to traffic during reclamation. The reclaimed road design will be the same as the operational design, and is shown on Plate 3-5.

As backfilling and grading is completed, operational areas will be scarified by gouging to a depth of approximately 8 inches with a trackhoe. This will reduce compaction and prevent topsoil slippage, and improve soil retention and vegetation establishment in the gouges.

The road reclamation plan adequately addresses the requirements to close the roads to the public during reclamation. It also describes disposal of road surface materials and how the culverts will be reclaimed.

### **Retention**

The application says those sections of the road that will be retained as part of the post mining land use will have the same design as the roads during operations.

### **Findings:**

The applicant met the minimum requirements of this section.

## **HYDROLOGIC INFORMATION**

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; 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**

The Operational ground-water monitoring plan will continue through reclamation to bond release.

#### **Surface-water monitoring**

The operational surface-water monitoring plan will continue through reclamation to bond release.

#### **Acid and toxic-forming materials**

See the operations section of this TA.

#### **Transfer of wells**

No discussion on transfer of wells in the new permit area is provided. It is assumed all wells will be properly abandoned when no longer needed for mining.

#### **Discharges into an underground mine**

No discharges into an underground mine are proposed for reclamation purposes.

#### **Gravity discharges**

No discussion indicating gravity discharges is expected in relation to the Wild Horse Ridge reclamation.

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**Water quality standards and effluent limitations**

No specific information is presented indicating how water quality standards and effluent limitations will be determined prior to bond release.

**Diversions**

Roads to be retained in place will be re-graded to the proposed post-mining configuration and fitted with diversions. A typical cross section is in 3.6.4, pg. 3-60. To maintain the road for post-mining land use, 11 culverts will be retained. The Wild Horse Ridge Access Road is proposed for retention for post-mining land use. Conveyor Access roads No.1(lower road) and No.2 (upper road) are described in App.3-O and will be reclaimed the same as described in section 3.6.11 and 3.6.12 (3D-7A). Stream channel reclamation uses a riprapped channel design as presented in Appendix 7H. These appear to meet regulatory requirements.

**Stream buffer zones**

Construction in the buffer zone will be necessary during reclamation. The sequence of construction is designed for minimum sediment generation. Silt fences are used to control sediment that is developed.

**Sediment control measures**

All re-graded and top soiled areas will be mulched or otherwise treated to retain moisture and control sediment page 4-13. Related surfaces will be ripped and scarified using a trackhoe, and include roughening to 8-12 inch deep pockets. See sedimentation ponds.

**Siltation structures**

See sedimentation ponds.

**Sedimentation ponds**

Sediment pond 'D' is proposed to be removed during reclamation of the portal pad as described in Appendix 7-K, and Section 3.6.12, Wild Horse Reclamation Plan. The reclamation construction sequence describes the methods used during pad area reclamation to minimize sediment contributions to the drainage. These include installation of silt fences on the downstream sides of all construction areas, especially the portal pad area. After highwall removal, the road cut slope will be eliminated. A "pilot cut" will be retained to allow topsoil placement in the area. The pilot cut will then be reclaimed.

**Other treatment facilities**

No other treatment facilities are proposed in conjunction with the Wild Horse Ridge amendment.

**Exemptions for siltation structures**

No exemptions for siltation structures are requested in association with the Wild Horse Ridge amendment.

### **Discharge structures**

No Discharge structures are proposed for retention in association with the Wild Horse Ridge amendment.

### **Casing and sealing of wells**

No changes are made to the existing plan in conjunction with casing and sealing of wells. It is assumed the existing plan is adequately addresses this requirement.

### **Findings:**

The application meets the minimum regulatory requirements for this section.

## **REVEGETATION**

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

### **Analysis:**

#### **Timing**

Table 9.5-1 of the current MRP is a revegetation schedule. According to this schedule, seeding would be done in October and November with seedlings planted in March and April of the subsequent year. While this schedule is adequate, other operators in the area have had good success planting containerized seedlings in the fall. Bareroot plants or cuttings should be planted in the spring.

#### **Mulching and other soil stabilizing practices.**

Chapters 3 and 8 discuss surface preparation. As backfilling and grading are completed, operational areas will be scarified by gouging about eight inches deep with a trackhoe. All areas will be gouged to increase surface roughness.

Following surface preparation, the site would be hydroseeded or otherwise broadcast seeded. All hydroseeded or hand seeded areas will be raked lightly to ensure adequate seed-soil contact. On slopes steeper than 2h:1v, one-half of the seed will be applied, the area will be raked, then the rest of the seed will be applied.

The applicant has included canyon sweetvetch in the seed mix. This species will be planted on the topsoil pile. The applicant will obtain seed for final reclamation by harvesting seed from the topsoil pile and from nearby undisturbed areas.

The applicant has proposed to reduce the number of rose seedlings, and this reduction is acceptable. Willows will be cut from a source area in close proximity to the mine site and planted in the reclaimed area.

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**RECLAMATION PLAN**

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In areas of suitable habitat, willows will be planted with at least one cutting every foot. Other operators have needed to come back after a few years to supplement willow plantings, and it may be necessary for the applicant to do this. It is common that sediment builds up over a few year in a riprapped channel, and these areas with sediment accumulation become good places to plant willows.

The plan gives detailed descriptions of how seedlings would be handled and planted and about the quality of seed that would be used. Following these commitments should help ensure successful revegetation.

A minimum of 120 pounds per acre of wood fiber hydromulch will be used when hydroseeding. It is a standard practice to add some hydromulch when hydroseeding, but adding all the mulch when seeding reduces seed contact with the soil.

Following seeding, all areas with slopes flatter than 2h:1v will hydromulched and fertilized. Slopes steeper than 2h:1v will be mulched with erosion control matting.

Section 9.5.5.1 contains a list of noxious weeds, and this list has been updated.

The current MRP includes a revegetation monitoring schedule. The performance standards in R645-301-356 require that for lands with a postmining land use of wildlife habitat, at least 80% of woody plants must have been in place for at least 60% of the extended responsibility period, and no trees or shrubs in place for less than two years may be counted toward the success standard. To show this standard has been met, it would be necessary to monitor for woody plant density in the fourth and eighth years after reclamation, and the monitoring schedule in the plan does not show monitoring would be done in these years. This is not considered a deficiency since the regulations do not require a monitoring schedule, but the applicant should be aware of the monitoring requirements imposed by the success standards.

The revegetation methods in the application should provide vegetation that complies with the requirements of R645-301-342 for wildlife habitat and with the performance standards in R645-301-353 and R645-301-356. The Division considers that revegetation is feasible at this site.

### **Standards for success**

The proposed reference area had more vegetative cover than the proposed disturbed area, but the difference was not significant. The reference area had significantly more woody plants than the proposed disturbed area, but this is not critical because the success standard is a technical standard established in consultation between the Division and Wildlife Resources (see below). While there are some differences in species composition between the reference area and proposed disturbed area, the reference area is similar enough that it is considered an acceptable standard.

The reference area had 1405 woody plants per acre, and the proposed disturbed area had 1010. Considering the plant communities and the topography, 1010 is considered an attainable and acceptable standard for success for woody plant density, and the applicant has included the standard in the application.

**Findings:**

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

**CESSATION OF OPERATIONS**

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

**Analysis:**

The plan for cessation of the operation is part of the approved MRP.

**Findings:**

The amendment meets the minimum requirements of this section.

**MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS**

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

**Analysis:**

**Affected area boundary maps**

The applicant did not give the Division an affected area boundary map. The Division usually considers the permit area to be equal to the affected area. Plate 2-1 is the permit area map and the Division found that the map accurately shows the permit boundaries.

**Bonded area map**

The Division usually considers the bonded area to be equal to the disturbed area. Plate 3-2A, Plate 3-2B and Plate 3-2F show the disturbed area boundaries during reclamation.

**Reclamation backfilling and grading maps**

The applicant must give the Division detailed maps that show how the backfilling and grading requirements will be met. The specific items missing from maps and cross sections are the location of the highwalls, cut slopes and coal seams.

**Reclamation facilities maps**

The applicant gave the Division detailed maps of all reclaimed facilities including but not limited to the access road.

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**RECLAMATION PLAN**

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**Final surface configuration maps**

The applicant gave the Division detailed maps and cross sections that show the final surface configuration.

**Findings:**

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

**R645-301-542.200**, The applicant must give the Division detailed maps that show how the backfilling and grading requirements will be met. The specific items missing from maps and cross sections are the location of the highwalls, cut slopes and coal seams.

**BONDING AND INSURANCE REQUIREMENTS**

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

**Analysis:****Determination of bond amount**

The Division reviewed the reclamation cost estimate. The Division needs to clarify some reclamation cost data with the applicant before the bond amount can be determined. The Division will handle the bond calculations in person.

**Findings:**

The Division will discuss this issue with the applicant and determine the bond amount

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