# State of Utah

Utah Oil Gas and Mining

# Coal Regulatory Program

Bear Canyon Mine
Co-Op Mining Company
Technical Analysis
November 27, 2007

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# TECHNICAL ANALYSIS DESCRIPTION

The Division ensures that coal mining and reclamation operations in the State of Utah are consistent with the Coal Mining Reclamation Act of 1979 (Utah Code Annotated 40-10) and the Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87). The Utah R645 Coal Mining Rules are the procedures to implement the Act. The Division reviews each permit or MRP for permit change, renewal, transfer, assignment, or sale of permit right for conformance to the R645-Coal Mining Rules. The Permittee must comply with all the regulatory requirements as established by the R645 Coal Mining Rules.

The regulatory requirements for obtaining a Utah Coal Mining Permit are included in the section headings of the Technical Analysis (TA) for reference. A complete and current copy of the coal rules can be found at http://ogm.utah.gov

The TA is organized into section headings following the organization of the R645-Coal Mining Rules. The Division analyzes each section and writes findings to indicate whether or not the MRP is in compliance with the requirements of that section of the R645-Coal Mining Rules.

# GENERAL CONTENTS

## IDENTIFICATION OF INTERESTS

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

**Analysis:**

Chapter 2 provides information regarding ownership and control of the Bear Canyon Mine. The Permittee is Co-Op Mining Co. (also known as C.W. Mining Co.), a Utah corporation located in Salt Lake City (p. 2-3). C. W. Mining Co. is registered with the State of Utah to do business as (DBA) Co-Op Mining Company. [09152005]

The federal identification number for C. W. Mining Co. is 87-0399230. The last names and initials of the Officers and Directors of C.W. Mining Co. are provided along with their addresses and titles. C.W. Mining Co. will pay the abandoned mine fee.

Co-Op Mining Co. also held Utah coal mining permit C/015/021for the Trail Canyon Mine. Trail Canyon Mine received final bond release on December 29, 2000.

By definition, the owner of the coal lease is presumed to have ownership or control over the Lessee (see R645-100-200. Definitions) and therefore R645-301-112.400 requires that the Permittee provide ownership and control information for the coal leaseholder, unless no controlling interest can be demonstrated. The Permittee has provided the officers and directors of C.O.P. Coal Development Co., the coal lease owner, but has also indicated that the company has no control over C.W. Mining. [09152005]

The current plan includes MSHA numbers for the Bear Canyon No. 1 and No. 2 Mines, and the MRP shows an MSHA number for the facilities at the Bear Canyon No. 3 Mine. The MSHA number for the Bear Canyon No. 4 Mine is listed as MSHA 42-02335, (See Chapter 1, Section 112.700, page 1-7 of the MRP). [01092006]

**Findings:**

The information provided meets the identification of interests' requirement 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 1-A of the MRP contains current information on violations issued by DOGM. In conjunction with the permit renewal, the Division conducted a check of the AVS system on March 23, 2007 and found no reports of violations. [02012007]

**Findings:**

The information provided in the MRP meets the violation reporting requirements of the regulations.

## RIGHT OF ENTRY

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

**Analysis:**

Right of entry to the subsurface was secured by C. O. P. Coal Development Co. through lease assignments and lease agreements found in Appendices 1-B and 1-E. C. O. P. Coal Development Co. is the owner of record of fee ground and federal coal leases U-024316, U-20668, U-38727, U-46484, U-61048, and U-61049 within the permit area (federal lease U-024318 was mined out in 1984-1985 and is not in the permit area). CO-OP Mining Co. leases the fee and federal coal from C. O. P. Coal Development Co (letter dated January 1, 2001 in Appendix 1-B. [02012007]

The legal description of the lease area described in Chapter one page six includes the NE1/4 of the NE1/4 of section 24, T. 16 S., R. 7 E. Right of entry was specifically granted by the BLM in a letter from James Kohler, Bureau of Land Management Chief, Solid Minerals, to the Division, dated February 9, 2005. Coal ownership is shown on Plate 1-3. [03282007]

**Findings:**

The information provided in the MRP meets the right of entry requirements 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:**

Plate 1-1 shows the Permit Area, Plate 1-2 shows Surface Ownership, Plate 1-3 shows Sub-Surface Ownership. The initials COP on the plates stand for C.O.P. Coal Development Company. Table 1-3 lists the owners of the surface and mineral property rights within the permit area. The legal description for the permit area is included on page six of chapter one. [03282007]

The operations are not within 100 feet of a public road. The operations are within 300 feet of three occupied dwellings owned by C.O.P. Coal Development Co. (Appendix 1- F contains waiver letters from the owners and occupants of these buildings.) Plate 3-3 shows a dwelling (hunting cabin) in the SW1/4 SE1/4 Sec 24, directly above the Tank Seam mine workings shown on Plate 3-4C and within 1000 ft of the Blind Canyon Seam workings shown on Plate 3-4C (Section 3.4.2.4). There is no portion of the area permitted within an area designated as unsuitable for mining (MRP, section 2.5). The Division is unaware of any study or petition for designation as unsuitable. [02012007]

**Findings:**

The information provided in the MRP meets the legal description requirements of the regulations.

# PERMIT TERM

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

**Analysis:**

The permit area description is found in (Sec. 112.500 and 112.600). The permit area falls within Township 16 South, Ranges 7 and 8 East, SLBM as shown on Plate 1-1. The permit area acreage now totals 10,967.39 acres. The permit area is categorized by surface and subsurface ownership in Table 1-3. Plate 1-2 provides the key to understanding Table 1-3. The 2007 lease additions increase the private surface area by 3754.16 acres and the federal surface area by 3837.13 acres.

Disturbed area boundaries are shown on Plates 5-2, which are the surface facilities maps. The surface acreage disturbed by the mine encompasses approximately 40.46 acres. The disturbed acres are listed in Table 2-7, Reclamation Area Summary. [02012007]

The current permit was issued on November 2, 2005 and expires on November 2, 2010. There were no special conditions placed on this permit other than using the electronic water monitoring database. The previous special condition regarding monitoring of groundwater inflows into Mine #1 was removed when the Permittee notified the Division that reclamation of Mine #1 was initiated on December13, 3003 (2003Incoming folder, document 0037.pdf). [02012007]

The legal description for the permit area is:

**Permit Area**

**Township 16 South, Range 7 East, SLBM**

Sec. 1: Lots 1 and 2, S1/2 NE1/4, SE1/4;
Sec. 10: N1/2, N1/2 S1/2, SE1/4 SW1/4, S1/2 SE1/4;
Sec. 11: All;
Sec. 12: All;
Sec. 13: All;
Sec. 14: NE1/4, E1/2 NW1/4, S1/2;
Sec. 23: E1/2, E1/2 W1/2;
Sec. 24: All;
Sec. 25: All;
Sec. 26: NE1/4 NE1/4, NW1/4 NE1/4, N1/2 SW1/4, NE1/4 and the access/haul road and topsoil storage area as shown on Plate 2-1.

**Township 16 South, Range 8 East, SLBM**

Sec. 6: Lots 11-14, E1/2 SW1/4, W1/2 SE1/4, SE1/4SE1/4;
Sec. 7: All;
Sec. 8: NW1/4, W1/2 E1/2, N1/2 SW ¼, SE1/4 SW1/4, SW1/4 SW1/4;
Sec. 16: All;
Sec. 17: All;
Sec. 18: All;
Sec. 19: S1/2 NW1/4, SW1/4, SW1/4 SE1/4, N1/2SE1/4, S1/2 NE1/4, Lot 1, NE1/4 NW1/4, N1/2 NE1/4;
Sec. 20: S1/2 NW1/4, N1/2 SW1/4, N1/2 NW1/4, NE1/4, NE1/4 SE1/4;
Sec. 21: E1/2 NW1/4, NE1/4, N1/2 SE1/4,W1/2 NW1/4, N1/2 SW1/4,SE1/4SW1/4,S1/2SE1/4;
Sec. 30: W1/2, W1/2 NE1/4, NW1/4 SE1/4; and
Sec. 31: NE1/4 NW1/4, NW1/4 NE1/4
[03282007]

**Findings:**

The information provided in the application meets 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:**

Previous publication affidavits are provided in Appendix 1-D. The most recent lease addition was published in the Emery County Progress on October 18, 25, November 1, and 8, 2005. [02012007]

Appendix 1-C contains the current general liability insurance, which provides effective coverage on an annual basis. An aggregate amount of $2,000,000 is provided for bodily injury and property damage; $1,000,000 is the amount of provided coverage for each occurrence. [02012007]

The Division received a request for an informal conference on January 27, 2000. The request was from J. Craig Smith and Scott M. Ellsworth of Nielsen and Senior representing the Huntington-Cleveland Irrigation Company. The conference was conducted February 22, 2000, and the MRP has been modified in accordance with requirements of the order resulting from that conference. [06072005]

**Findings:**

The information provided meets the requirements for public notice and liability insurance requirements of the Regulations.

## FILING FEE

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

**Analysis:**

A filing fee was paid at the time of initial permit issuance.

**Findings:**

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

## PERMIT MRP FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

**Analysis:**

A reformatted, electronic version of the Bear Canyon MRP was approved in 2005. The Bear Canyon Mine is commended as the first in the State of Utah to provide a completely electronic version of their permit.

The .xls file included with the January 27, 2003 electronic copy of the submittal provides a cross reference for new and old plate numbers and provides new appendix numbers, but does not cross reference changes to the narrative. The technical analysis contains cross-reference charts for the narrative, appendices, tables and maps for information pertinent to soils of the site.

Soils information previously located in Chapter 8 and Appendices is now found in Chapter 2 and Appendices; consequently all the maps and table numbers begin with 2 (i.e. Plates 2-1A rather than 8-1 which is the Main Area Soils Map). Cross-reference charts are key to the understanding of previous technical memos on the Bear Canyon Mining and Reclamation Plan.

The MRP-Part B meets the requirements of R645-301-121.100, R645-301-121.200, and R645-301-121.300 for the Biology Chapter and Archeology Section because the Permittee presents current, clear, and concise information that follows Division format.

Outside materials are cited throughout Chapters 6 and 7. A bibliography has been added at the end of Chapter 6. Chapter 7 has two reference sections.

**Findings:**

Information provided in the MRP meets the requirements of this section of the regulations.

## REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

**Analysis:**

The following table shows the biology-related appendix numbers from the older and newly formatted MRPs, titles of appendices, and numbers of pages in each appendix:

| NEW FORMAT | OLD FORMAT | TITLE | NUM OF PGS |
|---|---|---|---|
| Appendix 3-A | Appendix 9-A | Vegetation analysis - reference area | 35 |
| Appendix 3-B | Appendix 9-B | Miscellaneous data | 6 |
| Not included | *Appendix 9-C* | *Vegetation monitoring* | |
| Appendix 3-C | Appendix 9-D | Shower house pad veg. and reference area | 29 |
| Appendix 3-D | Appendix 9-E | Tank seam access road vegetation | 21 |
| Appendix 3-E | Appendix 9-F | Vegetation studies for the fed. lease area | 15 |
| Appendix 3-F | Appendix 9-G | Vegetation sampling in the wild horse ridge area | 40 |
| Appendix 3-G | Appendix 9-H | Vegetation sampling in the wild horse ridge tank seam area | 33 |
| *Appendix 3-H* | *Proposed submittal* | Morland vegetation study | |
| Appendix 3-I | Appendix 10-A | Fish and wildlife resource information | 36 |
| Appendix 3-J | Appendix 10-B | Mitigation and impact avoidance procedure, general to all | 17 |
| Appendix 3-K | Appendix 10-C | Vertebrate species of southeastern Utah | 73 |
| *Appendix 3-L* | Not included | *Wildlife survey information* | 21 |

The following table shows the older and newly formatted MRP table numbers and titles:

| NEW FORMAT | OLD FORMAT | TITLE |
|---|---|---|
| Table 3-1 | Table 9.3-1 | Vegetation types |
| Table 3-2 | Table 9.2-1 | Vegetation reference areas |
| *Table 3-3* | Not included | *Recommended seed mix for interim reclamation* |
| Table 3-4 | Table 9.5-1 | Revegetation schedule |
| Table 3-5 | Table 9.5-2 | Recommended seed mix for riparian-creek bottom |
| *Table 3-6* | *Table 3-7* | *Recommended seed mix for pinyon juniper grass* |
| *Table 3-7* | Table 3-8 | *Suggested proportions of tack to fiber* |

Tables 3-3, 3-6, and 3–7 are new submittals.

The following table shows the older and newly formatted MRP figure numbers and titles:

| NEW FORMAT | OLD FORMAT | TITLE |
|---|---|---|
| Figure 3-1 | Figure 10-1 | Endangered mammalian species in relation to permit area |
| Figure 3-2 | Figure 9-19 | Correct planting procedures |
| *Figure 3-3* | Figure 9-20 | Seedling storage |

The following table shows the older and newly formatted MRP plate numbers and titles:

| NEW FORMAT | OLD FORMAT | TITLE |
|---|---|---|
| Plate 3-1 | Plate 9-1 | Vegetation map |
| Plate 3-2 | Plate 10-1 | Wildlife use area |

| | | |
|---|---|---|
| *Plate 3E-1* | Plate 9F-1 | Vegetation resources map for federal lease area |

Also pertaining to Biology, Plate 5-3b shows the raptor nests in relation to planned subsidence.

**Findings:**

The Division considers information in the MRP adequate to meet the requirements of the Biology-related information for Permit MRP Format and Contents section of the General Contents regulations.

# 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 technical analysis.

**Findings:**

The Division has determined that each section of the MRP is complete and accurate.

## PERMIT AREA

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

**Analysis:**

The permit area has increased from 3,376.18 acres to 10,991.83 acres (Sec. 112.500 and 112.600 and Plate 1-1). Table 1-3 outlines surface ownership, and subsurface ownership: coal, minerals, oil and gas, as well as grazing rights within and adjacent to the existing permit area. Areas A through E in Table 1-3 are illustrated on Plate 1-2. (Area E, a category of land with U.S.F.S. surface ownership and C.O.P. Coal Development Co. subsurface ownership (fee coal) is adjacent to the existing eastern permit boundary, but not within the permit area. Consequently, Area E is not described in Sec. 112.500 and 112.600 as part of the permit area).

The disturbed area (40.46 acres) is illustrated on Plates 5-2. Total disturbed acres are described in Table 1-4. [02012007]

**Findings:**

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

## HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

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

**Analysis:**

The MRP provides information about cultural resource sites within the permit area (Appendix 4A). One of the survey reports provides the results of a survey for the entire Wild Horse Ridge area and discusses the significance of a historic resource site. This single site is considered eligible for listing in the National Register of Historic Places.

The MRP also provides a copy of a cultural resource report conducted by Kenneth Juell of the University of Utah Archeological Center. Part of this survey included the Wild Horse Ridge area, and four drill sites associated with access roads (mainly on Wild Horse Ridge). The results show that no cultural resource sites were found. According to this report, there were no other sites in the area.

It is not clear from the report done by Mr. Juell whether the report included all available information about cultural resources in the Wild Horse Ridge area. In response to this concern, the Permittee conducted a literature search for all records of cultural resources in the area. .

A cultural resource survey of the proposed lease addition areas, (submitted July 22, 2005), is also provided for in the MRP as appendix 4F. This survey basically included the cliff faces and escarpments in sections 19 and 30 for the Wildhorse Ridge addition. Sagebrush Consultants LLC conducted a literature search for the Bear Canyon Lease addition areas see Appendix 4H and 4I. The search identified a number of eligible sites located in the escarpment areas of the Castle Gate sandstone formation. According to Bruce Ellis, (FS Archaeologist) and Matt Seddon, (SHPO), the results of the literature search indicated the need to conduct a ground survey of the escarpment and high probability areas. The Permittee and representatives from Sagebrush Consultants L. L. C. met with Bruce Ellis and defined the scope of the project. It was determined that approximately 820 acres of Federal and private land would be surveyed. Mr. Ellis reviewed the results of the completed survey including the private land portions. A copy of the final survey prepared by Sagebrush Consultants L. L. C. has been included in the MRP. A concurrence letter from the State Historic Preservation Office is on file at the Division office in Salt Lake. ***There are stipulations that are included as Attachment A to the permit. The stipulations require the permittee to monitor subsidence annually throughout the life of the mine and survey those areas that have subsided that were not included in previous survey inventories.***

**Findings:**

Information in the MRP 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:**

Section 724.400 discusses current climatic information. [06072005]

**Findings:**

The MRP meets the requirements for this section of the regulations.

## VEGETATION RESOURCE INFORMATION

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

**Analysis:**

The MRP includes a vegetation survey of the reference area in Trail Canyon (Mel Coonrod 1982 and 1983; Appendix 3-A). The MRP also includes surveys conducted by Patrick Collins for the Tank seam access road reference area (Appendix3-A) and shower house pad site and reference area (Appendix 3-C). The Permittee presents information in the Environmental Information section apparently related to these surveys. Although this information is somewhat disconnected, it provides scope, methods, equations, and results.

Appendix 3-F provides a report on the vegetation along the conveyor system and road for the Wild Horse project. This report includes quantitative measurements of vegetative cover and woody plant density. The report also contains measurements of vegetation productivity. Disturbances are narrow; therefore, the Permittee did not sample vegetation communities separately. The Permittee, in consultation with the Division, selected the reference area for the conveyor system and road as transitional between the lower drainage area and the pinyon/juniper/grass areas on the upper slopes.

Plates 3-1 and 3E-1 illustrate the vegetation community types for the permit area.

Vegetation resource information is included in chapter three of the approved Mining and Reclamation Plan, (MRP). Additional information regarding the Bear Canyon Lease Addition includes the redline strike out of page 3-2 and paragraphs one, two and three on page 3-3, 05/15/2006 of the submittal received on August 9, 2006. Plate 3-1 does include the reference areas and the text referring to the reference areas as described on page 3-1. Plate 3-1 was ground truthed with the Permittee on June 13, 14, 27, August 22, and September 20, 2006. The riparian communities associated with the springs and perennial streams have been documented in the text on page 3-32 section 322.220. A consensus of the locations of riparian areas within the proposed lease additions was determined after consulting with Pat Collins from Mt. Nebo Scientific and Mark Reynolds from Co-op Mining Company.

**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:**

GENERAL WILDLIFE

Plates 3-2 and 5-3b show raptor and big game habitat.

*Ungulates:* The entire Wild Horse Ridge area is either critical elk or deer winter range.

*Aquatics:* The right fork of Bear Creek is perennial, but it is not a fishery. The right and left forks of Fish Creek are also perennial but not fisheries.

*Raptors:* There are several raptor nests in the area including two within about 2000 feet of the Wild Horse surface facilities site.

THREATENED, ENDANGERED, AND SENSITIVE ANIMAL/PLANT SPECIES

*TES Plants*

The TES plant species that could occur in Emery County include: Barneby reed-mustard, Jones cycladenia, last chance Townsendia, Maguire daisy, Despain footcactus, Wright fishhook cactus, and the Winkler cactus. These species, however, occur at lower elevations than the mine.

The USFS (Region 4) lists canyon sweetvetch (*Hedysarum occidentale* Var. *canone*) and Link trail columbine (*Aquilegia flavescens* Var. *rubicunda*) as sensitive plant species. There are populations of these species within or adjacent to the Bear Canyon mine permit area. The Permittee has GPS locations for the known populations of sweetvetch within the permit area.

*TES Animals*

Bald eagles are common in the area during the winter and could occasionally fly through or roost within or adjacent to the permit area.

There are no recent, confirmed sightings of black-footed ferrets in Emery County.

The disturbed area for the Wild Horse Ridge project includes willows and other riparian vegetation. Populations of these vegetation types are not large enough to provide habitat for southwestern willow flycatchers.

For the Bear Canyon Lease Addition the MRP includes Appendix 3M-1, (Bat and Owl survey), Plate 3-2, (Deer habitat), Plate 3-3, (Elk habitat), Plate 3-4, (Black Bear habitat), Plate 3-5, (Bobcat habitat) and text revisions to pages 3-IV, 3-2, 3-14, and 3-28 and 3-29. Plates 3-2 and 3-3 were ground truthed with the permittee on June 13, 14 and 27, 2006. Mountain Lion habitat parallels that of the Mule Deer as described in Appendix 3-I. Since Mountain Lion habitat is wide spread no specific mapping is available through the DWR.

**Findings:**

Information provided in the MRP 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:**

A reformatted, electronic version of the MRP was approved in 2005. Soils information previously located in Chapter 8 is now found in Chapter 2. An .xls file accompanying the submittal provides a quick check to the changes made in Plate and Appendix titles. The Division

has created the cross-references for the narrative sections and table for use when reading the previous technical memos.

The .xls file included with the Public information Center January 2003 copy of the submittal provides a cross reference for new and old plate numbers and new plate titles. It is reprinted below with map titles added by the Division. New listings are in bold. This .xls file is not found on the other electronic copies of the submittal or in the hard copy.

| | | |
|---|---|---|
| Plate 2-1A | Formerly 8-1 | Soils Map (Main Area) |
| Plate 2-1B | Formerly 8-1A | Soils Map (WHR Area) |
| Plate 2-2A | Formerly 8-2 | Main Topsoil Stockpile Area |
| Plate 2-2B | Formerly 8.7 | WHR Topsoil Stockpile Area |
| **Plate 2-2C** | **Created for WHR Tank Seam** | **WHR Tank Seam Topsoil** |
| **Plate 2-2D** | **Created for Mohrland** | **Mohrland Topsoil Stockpile Area** |
| Plate 2-2E | Formerly 8-6 | Tank Seam Road Topsoil Stockpile |
| Deleted | Plate 8.4 | Ballpark Topsoil Pile Area |
| Plate 2-3A | Formerly 8-5A | Reclamation Area (TS 1 & 2 Ballpark Area) |
| Plate 2-3B | Formerly 8-5B | Reclamation Area (TS 2, 3, 4, & 9, Shower House Area) |
| Plate 2-3C | Formerly 8-5C | Reclamation Area (TS 5-8, Load-out Area) |
| Plate 2-3D | Formerly 8-5D | Reclamation Area (TS 6, Mine Access Road Area) |
| Plate 2-3E | Formerly 8-5E | Reclamation Area (TS 10 & 11, Tank Seam Portal Area) |
| Plate 2-3F | Formerly 8-5F | Reclamation Area (TS 12 & 13, WHR Access Road Area) |
| Plate 2-3G | Formerly 8-5G | Reclamation Area (TS 12, 14, 15, 16, & 17, WHR Portal Area) |
| Plates 5-2 series | Formerly 2-4 series | Surface Facilities Blind Canyon |

Plates in Chapter 2 (Soils) of the document are exactly the same as the existing MRP with one exception, Plates 2-2C (WHR Tank Seam Topsoil Stockpile Area) and 2-2D (Mohrland Topsoil Stockpile Area) are new listings and neither could be assessed. Apparently they have not been created yet.

Plate 2-2F Ballpark Topsoil Pile Area has been removed from the new format. This is appropriate since the Division approved the removal of the Ballpark from the disturbed area in 2001; and, Table 2-5, Topsoil Summary, does not include the Ball Park soils for use as substitute topsoil during final reclamation. Figures 2-1 and 2-2 in Chapter 2 are the same as Figures 8.9-1 (Photographs of the Ball Park Area) and 8.9-2 (Ball Park Topsoil Storage Pile) in the approved MRP. This information has been retained for historical purposes.

The .xls file included with the submittal provides new appendix numbers. For information pertinent to soils of the site, a cross-reference from the current MRP to the reformatted MRP is provided in the table below. There are no new listings of appendices for soils information.

| | | |
|---|---|---|
| Appendix 2-A | Formerly 8A | Soil Test Reports |
| Appendix 2-B | Formerly 8C | Prime Farm Lands |
| Appendix 2-C | Formerly 8D | Substitute Topsoil Material (Downcast) |
| Appendix 2-D | Formerly 8E | In-Place Plant Growth Material |
| Appendix 2-E | Formerly 8B | SCS Soil Survey |
| Appendix 2-F | Formerly 8F | WHR Soil Resource Inventory and Assessment |
| Appendix 2-G | Formerly 8G | WHR Tank Seam Soil Resource Inventory and Assessment |
| Appendix 5-I | Formerly 3-L | Cut & Fill calculations (for areas TS3-9) |
| Appendix 5-K | Formerly 3-P | WHR Tank Seam Pad and Access Road |
| Appendix 5O | Formerly 3-K | Sediment Pond Material |
| Appendix 7K | Formerly 7K | Alternate Sediment Control Areas (includes topsoil piles) |
| Appendix 5D | Formerly 3-E | Toxic Materials & Handling |

The .xls file included with the submittal did not itemize changes to the tables. Tables in Chapter 2 (Soils) of the document are exactly the same as the existing MRP with one exception; the Analytical Parameters For Baseline Soil Data Table 8.8-1 has been replaced with two tables (Table 2-4a and 2-4b) that were taken from the January 2003 DRAFT Division Soils Guidelines for Management of Topsoil and Overburden. Below is a cross-reference of the current and previous table numbers and new table titles in Chapter 2 of the document:

| | | |
|---|---|---|
| Table 2-1 | Formerly 8.3-1 | Soil Map Units |
| Table 2-2 | Formerly 8.3-2 | Soil Unit Acreage Within the Disturbed Area |
| Table 2-3 | Formerly 8.9-2 | Available Substitute Topsoil Material |
| Table 2-4a | **Replaced** 8.8-1 | Analytical Methods for Baseline Soils Data |
| Table 2-4b | **Replaced** 8.8-1 | Additional Analyses Required for Substitute Topsoil, Overburden, Spoil and Coal Mine Waste |
| Table 2-5 | Formerly 8.9-5 | Topsoil Summary Table |
| Table 2-6 | Formerly 8.9-4 | Ball Park Seed List |
| Table 2-7 | Formerly 8.9-1 | Reclamation Area Summary |
| Table 2-8 | Formerly 8.9-3 | Substitute Topsoil Summary |
| Table 2-9 | Formerly 8.11-1 | Final Grading Test Sample Density |
| Table 5K-1 | Formerly Table 3P-1 | WHR Tank Seam Topsoil Recovery |
| Table 5O-1 | Formerly Table 3K-1 | Analytical Parameters for Overburden (in Appendix 5O) |

The .xls file included with the submittal did not cross-reference changes to the narrative. Below is a cross-reference of the current and previous narrative sections pertaining to the soils

resource information, topsoil and subsoil operations plan, soils redistribution plan, and stabilization plans.

| | | |
|---|---|---|
| Section R645-301-221 | Formerly 8-6 | Prime Farm Lands |
| Section R645-301-222 | Formerly 8-1 & 8-2 | Soil Survey |
| Section R645-301-222.100 | Formerly 8-1 | Soil Maps |
| Section R645-301-222.200 | Formerly 8-3 | Soil Identification |
| Section R645-301-222.300 | Formerly 8-3 | Soil description |
| Section R645-301-222.400 | No previous reference | Soil Productivity |
| Section R645-301-223 | Formerly 8-7 and 8.7-1 | Soil Characterization |
| Section R645-301-224 | Formerly 8.9-1 | Substitute Topsoil |
| Section R645-301-230 | Formerly 8.8.1.1 | Operation Plan |
| Section R645-301-231 | Formerly 8.8.1.1 | General Requirements |
| Section R645-301-231.100 | Formerly 8.8.1.1 and 8.8.1.2 & 8.9.7 | Topsoil Removing and Storing |
| Section R645-301-231.300 | Formerly 8.11 | Soil Testing Plan |
| Section R645-301-231.400 | Formerly 8.9, 8.9.2 through 8.9.6 | Construction, Modification and Maintenance |
| Section R645-301-232 | No previous reference | Topsoil and Subsoil Removal |
| Section R645-301-232.100 | Formerly 3.5.4.2 | Topsoil Removal Prior to Disturbance |
| Section R645-301-232.200 | No previous reference | Insufficient Topsoil |
| Section R645-301-232.300 | No previous reference | Topsoil Material Less Than 6 in Thick |
| Section R645-301-232.400 | No previous reference | Area where topsoil will not be recovered |
| Section R645-301-232.500 | No previous reference | Subsoil Segregation |
| Section R645-301-232.600 | No previous reference | Timings |
| Section R645-301-233 | Formerly 8.9 | Topsoil Substitutes and Supplements |
| Section R645-301-234 | Formerly 8.8.1.3 | Topsoil Storage |
| Section R645-301-240 | Formerly 8.9.1 | Reclamation Plan |
| Section R645-301-241 | No previous reference | General Requirements |
| Section R645-301-242 | Formerly 8.10 | Soil Redistribution |
| Section R645-301-243 | Formerly 8.11 | Soil Nutrients and Amendments |
| Section R645-301-244 | Formerly 8.5 | Soil Stabilization |
| Section R645-301-250 | Formerly 8.4 | Performance Standards |

Cross-reference charts are key to the understanding of previous technical memos on the Bear Canyon Mining and Reclamation Plan.

Chapter 2, Soil Resources, Sections R645-301-221 through R645-301-250, discusses the soil resources for the Bear Canyon Mine.

**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 proposed Wild Horse Ridge area (sec 24 and 25, T. 16 S., R. 7 E. and sec 19 and 30 T.16 S. R. 8 E.). The determination letter from the NRCS is dated July 9, 1999, and is included in Appendix 2-B.

**Soil Survey Information**

Chapter 2 supplies soil resource information for the Bear Canyon Mine and the proposed Wild Horse Ridge expansion based on the following soil surveys:

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

All mapping and soil survey work were performed according to the standards of the National Cooperative Soil Survey.

The 1990 and 1999 Order I soil survey for the Bear Canyon Mine and Wild Horse Ridge cover Bear Canyon and in the Wild Horse Ridge mine expansion area. Soil maps Plate 2-1 and Plate 2-1A illustrate the soil mapping units and disturbed areas.

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 is provided for the Wild Horse Ridge in Appendix 2-F. For the Wild Horse Ridge 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 the NRCS Order II soil survey. Similar information is provided in Appendices 2-A, 2-B, and 2-E for the previously disturbed areas.

**Soil Characterization**

Section R645-301-222.200 and 222.300, 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 ten-soil mapping units are summarized in Table 2-1 and in Section R645-301-222.300.

Information specific to Wild Horse Ridge is found in Appendix C within Appendix 2-F. Test results are included with the Order I soil Survey in Appendix F. Pit locations are shown on Plate 2-1B. Soil samples were sent to Inter-Mountain Laboratories, Inc. for analysis. Appendix B contains the analytical data on seven soil samples selected from representative soil layers in the Wild Horse Ridge survey. These samples were characterized according to the 1988 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 SAR value was 3.7 and pH was 8.3. The CW10-1 sample site is at the edge of the existing road accessing the future portal site. Every effort should be made to minimize disturbing and/or mixing the deeper subsoils (20 to 30 inches) of this section of road cut.

Soil productivity information is found in Appendix 2-E, SCS Soil Survey and Appendix 3-B Miscellaneous Vegetation Information.

**Substitute Topsoil**

The PAP 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 2-D.

**Findings:**

Information provided in the MRP 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 MRP, the permit area is 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 MRP discusses previous mining activity in the area. Various entities have operated mines in the area since 1885.

The MRP 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 MRP 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:**

**Alluvial Valley Floor Determination**

The Bear Canyon permit area does not contain alluvial valley floors as defined in R645-100. It is primarily an upland area with grazing and wildlife habitat land uses. Deposits are mostly colluvial with some water-laid deposits from sheet flow and other unconcentrated runoff events.

**Applicability of Statutory Exclusions**

**Findings:**

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

## 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 proposed Wild Horse Ridge area (sec 24 and 25, T.16 S. R., 7 E. and sec 19 and 30, T.16 S., R. 8 E). The determination letter from the NRCS is dated July 9, 1999, and is included in Appendix 2-B.

**Findings:**

The Division concurs with the Natural Resources Conservation Service that there are no prime farmlands within the disturbed area.

## GEOLOGIC RESOURCE INFORMATION

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

**Analysis:**

The MRP 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.

The MRP includes a description of the areal and structural geology of the proposed permit and adjacent areas, including federal leases U-024316, U-61048, U-46484, U-61049, 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, *Investigation of Groundwater and Surface Water Systems and Probable Hydrologic Consequences*, a report by Mayo and Associates, LC.; Appendix 7-J was updated in 2007 with *Probable Hydrologic Consequences of Coal Mining in the Mohrland Permit Area*, These descriptions show how areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water.

The permit boundary as shown on revised Plates 6-1 through 6-12 includes the federal leases 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. 7-J1 and 7-J2 are stratigraphic cross-sections based on logs from boreholes 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 is 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.

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. Borehole logs and well completion diagrams for DH-1, DH-2, DH-3, and DH-4 are in Appendix 7N-G.

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 boreholes (Section 7.1-4).

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.

Tonnages in Table 3.4-1 have been updated to match the most recent R2P2. [09212005]

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 Permittee has made no request to the Division to waive in whole or in part the requirements of the borehole information or analysis required of this section. [02262007]

**Findings:**

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

## HYDROLOGIC RESOURCE INFORMATION

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

**Analysis:**

**Sampling and Analysis**

The MRP meets the requirements for Sampling and Analysis as provided in R645-301-723. The Division finds that these regulations are met because the following sampling and analysis information is provided in the MRP. On page 7-3 of the MRP, the Permittee states that all water quality analyses will be conducted "according to the methodology in the current edition of Standard Methods for the Examination of Water and Wastewater or the methodology in 40 CFR Parts 136 and 434". In addition, the Permittee has committed to having all samples analyzed by certified laboratories.

**Baseline Information**

The MRP meets the requirements for Baseline Information as provided in R645-301-724. The Division finds that these regulations are met because the following baseline information is provided in the MRP. Pages 7-26 and 7-36 of the submittal outline the monitoring and data collection commitments provided by the Permittee for groundwater and surface water respectively. In each instance, the Permittee has committed to obtaining three years of hydrologic baseline data prior to mining in the affected area, which exceeds the minimum requirements provided by law. In addition, the Permittee has committed to following the Division recommended list for baseline parameters.

Page 7-53A of the submittal contains a surface and ground water monitoring matrix (Table 7-14A and Table 7-14B respectively) that list sites to be utilized in collecting baseline data. The Permittee has provided a baseline monitoring start date that insures that a minimumof three years of baseline data will be obtained prior to mining in that area. In addition, references to Tables 7-13 and 7-17 are provided. These tables provide a comprehensive list of the ground

and surface water quality monitoring parameters that will be analyzed for. Table 7-14 is referenced which details the sampling months and actual monitoring schedule. Plate 7-4 depicts the locations of the current and proposed monitoring points.

Appendix 7-J, 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 Groundwater Monitoring provides further discussion of hydrologic resources within the permit area. 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.

Water Rights within and adjacent to the permit area are depicted on Plate 7-12, Water Rights. The map depicts the location of the water right, the water right number and (when applicable) the points of diversion. Table 7-6 on pages 7-32 thru 7-33B of the MRP lists the water rights, the owner of the water right, the priority date, the place of use, the point of diversion as well as the nature of the water right use. Additional water right information is provided in Appendix 7C of the MRP.

The information presented in Appendix 7-J describes the surface water and ground water systems of the Bear Canyon permit area as well as the adjacent areas. Surface water and ground water resources were evaluated by analyzing: 1) solute and isotopic compositions of surface waters and ground waters, 2) surface water and ground water discharge and quality data, 3) piezometric data and 4) geologic information.

Hydrographs are presented for the springs from each of the geologic units as well as for streams and other surface water features within the proposed lease expansion areas. In addition, the reports in Appendix 7-J discuss the seasonal flow variations in the springs and streams as well as discussing the chemical composition of the various water sources, both surface and ground water.

Water quality data is provided in several places within Appendix 7-J. Table 3 provides the mean solute chemistry of creeks, springs, wells and mine inflows as well as the minimum and maximum concentrations obtained from the various sampling points throughout the permit area and adjacent areas. A tabulation of both field parameters obtained during sampling as well as the trace constituent water quality data obtained from laboratory analysis is provided as well.

**State Appropriated Water Rights**

The application meets the hydrology requirements for Environmental Description of State Appropriated Water Rights as provided in **R645-301-724.100 and –724.200**.

Table 7-6 of the MRP on pages 7-32 thru 7-33B provides a comprehensive list of the state appropriated water rights within the existing permit area as well as in the proposed lease expansion area. The table lists the water right number, the owner of the water right, the priority date, a legal description of the place of use, a description as to the type of diversion as well as the nature of use.

Plate 7-12: Water Rights depicts the locations of the water rights identified in Table 7-6. In addition, Plate 7-12 depicts the extent of point-to-point diversions for the state appropriated water rights that are utilized in that manner.

In addition, Appendix 7-C contains supplemental Water Right information.

**Ground-water Information**

The MRP meets the Environmental Description regulations for Ground-water Information as provided in R645-301-724.100. The Division finds that these standards are met because of the ground-water information provided in the MRP as outlined below. Appendix 7-J of the MRP contains detailed hydrologic study conducted by Mayo and Associates in June of 2001. The report, '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 Groundwater Monitoring' provides a detailed evaluation and discussion of the ground water resources within the permit area at the time of the report (2001), the Wild Horse Ridge area as well as the Mohrland expansion area. On February 7, 2007, the Permittee provided the Division with an addendum to the Appendix 7-J report to address the hydrologic systems within Federal Leases U-46484, U-61048, U-61049, U-024316 as well as the Mohrland fee surface. The Permittee has committed to collecting 3 years of baseline data on ground water resources that could potentially be impacted by mining activity. Plate 7-4 depicts the proposed monitoring sites. Upon comparing Plate 7-4 with the mine workings maps (Plate 5-1A Blind Canyon Seam Workings, Plate 5-1B Hiawatha Seam Workings and Plate 5-1C Tank Seam Workings) and based on several field visits in the proposed lease expansion, the Permittee has produced a monitoring plan that will adequately quantify and monitor groundwater resources in the area. The Division recommended list for baseline parameters will be followed which exceeds the minimum required by law. In addition, every five years baseline parameters will be collected. The remainder of the time, field readings will be collected.

Baseline data presented in Appendix 7-J of the MRP provides the names, locations, ownership, and descriptions of all ground water resources within the permit area as well as adjacent to it. In addition, water quality and quantity information is presented in Appendix 7-J that demonstrates seasonal variation in the ground water features. Table 7-6 of the MRP on

pages 7-32 thru 7-33B provides a comprehensive list of the state appropriated water rights within the existing permit area as well as in the proposed lease expansion area. The table lists the water right number, the owner of the water right, the priority date, a legal description of the place of use, a description as to the type of diversion as well as the nature of use. Additional water right information is presented in Appendix 7-C.

Appendix 7-N Revised Hydrogeologic Evaluation of the Bear Canyon Mine Permit and Proposed Expansion Areas (1993) contains additional ground water information.

Plate 7-12: Water Rights depicts the locations of the water rights identified in Table 7-6. In addition, Plate 7-12 depicts the extent of point-to-point diversions for the state appropriated water rights that are utilized in that manner. Plate 7-4, Water Monitoring, depicts the locations of the ground water resources both within the permit area as well as adjacent to it.

Two general types of ground water systems exist in Gentry Mountain: perched groundwater systems and Star Point Sandstone fracture-flow ground water systems. Perched systems occur in the Flagstaff Limestone, North Horn Formation, Price River Formation and Blackhawk geologic formations. Fracture flow ground water systems exist in the Star Point Sandstone. Natural discharges from fracture-flow ground water systems support two significant Star Point Sandstone Springs on Gentry Mountain. These springs are Big Bear Spring (SBC-4) and Birch Spring (SBC-5), which are located immediately south of the existing permit area.

**Surface Water Information**

The MRP meets the Environmental Description regulations for Surface Water Information as provided in R645-301-724.100. The Division finds that these standards are met because of the surface water information provided in the MRP as outlined below. Appendix 7-J of the MRP contains a detailed hydrologic study conducted by Mayo and Associates in June of 2001. The report, '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 Groundwater Monitoring' provides a detailed evaluation of hydrologic resources within the permit area at the time of the report (2001), the Wild Horse Ridge area as well as the Mohrland expansion area. On February 7, 2007, the Permittee provided the Division with an addendum to the Appendix 7-J report to address the hydrologic systems within Federal Leases U-46484, U-61048, U-61049, U-024316 as well as the Mohrland fee surface.

The permit area contains the headwaters of several perennial streams that could be affected by underground mining activity. As such, the major groundwater sources providing base flow to these drainages are to be monitored. In addition, surface water monitoring sites have been selected at all major confluences and at other points of interest as identified by

stakeholders (water right holders, USDA Forest Service). The parameters to be tested for and the schedule to be followed are based on the probable hydrologic consequences (PHC) as outlined in Appendix 7-J. Three years of baseline data will be collected which exceeds that required by law. The Division recommended list for baseline parameters will be followed which also exceeds the minimum required by law. Sampling will be primarily achieved through field parameters with a full suite of baseline data collected every five years. Plate 7-4 depicts the current and proposed monitoring sites. Upon comparing Plate 7-4 with the mine workings maps (Plate 5-1A Blind Canyon Seam Workings, Plate 5-1B Hiawatha Seam Workings and Plate 5-1C Tank Seam Workings) and upon several field visits in the proposed lease expansion, the Permittee has produced a monitoring plan that will adequately quantify and monitor groundwater resources in the area.

Baseline data presented in Appendix 7-J of the MRP provides the names, locations, ownership, and descriptions of all surface-water bodies including streams, lakes and impoundments both within the permit area as well as adjacent to it. In addition, water quality and quantity information is presented in Appendix 7-J that can sufficiently demonstrate seasonal variation in the various surface water features. Table 7-6 of the MRP on pages 7-32 thru 7-33B provides a comprehensive list of the state appropriated water rights within the existing permit area as well as in the proposed lease expansion area. The table lists the water right number, the owner of the water right, the priority date, a legal description of the place of use, a description as to the type of diversion as well as the nature of use. Additional water right information is presented in Appendix 7-C.

The information in Appendix 7-J and the MRP identify Trail Creek, Bear Creek, Lower Cedar Creek and the Left and Right Forks of Fish Creek as perennial streams. The upper Trail Creek, McCadden Hollow, Blind Canyon and Upper Cedar Creek are intermittent or ephemeral.

Most of the stream flow is attributed to runoff from snowmelt or rain. Spring flow contributes the most to the baseflow of the streams in later summer and fall months.

**Baseline Cumulative Impact Area Information**

The MRP meets the hydrology Environmental Description for Baseline Cumulative Impact Area Information as provided in R645-301-725. The Division finds that these standards are met because Chapter 7 of the MRP and the PHC determinations located in Appendices 7-J, 7-N adequately present hydrologic and geologic information for the cumulative impact area needed by the Division to provide an assessment of the probable cumulative hydrologic impacts.

**Modeling**

The Division finds that the MRP meets the Environmental Resource Information requirements for Modeling as provided in R645-301-726. The Division finds that these

requirements have been met in that actual surface and ground water information was provided in the preparation of the MRP. As such, ground and surface water modeling are not deemed necessary at this time.

**Alternative Water Source Information**

The Division finds that the MRP meets the Environmental Resource Information regulations for Alternative Water Source Information as provided in R645-301-727. The Division finds that these standards are met because of the information provided on pages 7-61D thru 7-61F of the MRP. The PHC has identified the potential for mining activity to potentially impact surface and ground water resources within the permit area as well as adjacent to it. The aforementioned pages outline the Permittee's commitment to provide alternative water sources in the event that mining activity causes a contamination, diminution or interruption of an underground or surface source of water. The MRP discusses the transfer or retirement of water shares held by C.W. Mining to the affected parties on page 7-61E. Additional alternative water sources could also be provided by the utilization of guzzlers, wells or other available technologies as outlined on page 7-61D.

**Probable Hydrologic Consequences Determination**

The Division finds that the MRP meets the Environmental Resource Information regulations for Probable Hydrologic Consequences as provided in R645-301-728. The Division finds that these standards are met because of the information provided in Appendix 7-J. Appendix 7-J contains a report compiled by Mayo and Associates, LC in June 2001. The report, *Probable Hydrologic Consequences of Coal Mining in the Bear Canyon Mine Permit Area and Recommendations for Surface Water and Groundwater Monitoring*, describes the surface-water and groundwater systems of the mine lease area (prior to 2001), the Wild Horse Ridge Area and the Mohrland area. In addition, the potential for mining related impacts to ground and surface water resources are discussed in the document. The PHC determinations presented in Appendix 7-J are based on the baseline hydrologic information. The PHC determinations make findings on potential hydrologic impacts due to coal mining in the permit area as outlined in R645-301-728.300. The PHC determinations are accurate and complete and find that the coal mining activities proposed for the permit area will not result in the contamination, diminution, or interruption of State-appropriated water or of surface water or groundwater within or adjacent to the permit area.

Dr. Mayo was contacted by C.W. Mining to provide an addendum to the 2001 report in light of the lease expansion being approved by the Division. The addendum was provided in an effort to more specifically address the potential impacts of mining in the lease expansion. The original report produced in 2001 examined the ground and surface water resources in the 2007 expansion area. However, upon review of the document, it was determined that a more detailed analysis was required. Dr. Mayo, for clarification, refers to two distinct areas contained within

the 2007 expansion area: the Mohrland Area and the McCadden Hollow Area. The Mohrland Area includes federal leases U-61048, U-61049 and U-38727 as well as a large area of fee land. The McCadden Area is located in the northwest portion of the 2007 lease expansion and is contained within federal lease U-46484 and U-24316. The Bear Canyon Fault separates these two areas.

The Gentry Mountain Cumulative Hydrologic Impact Assessment (CHIA) provides a detailed discussion of the potential impacts from coal mining activity within the Bear Canyon permit area.

**Findings:**

Information provided in the MRP meets the Hydrologic Resource Information requirements of the R645-State of Utah Coal Mining Rules.

## 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 Permittee 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 MRP suggests that the permit area and affected area boundaries are the same. The Permittee did give the Division a permit boundary map, Plate 2-1. The Division found Plate 2-1 to be adequate.

**Archeological Site Maps**

Chapter 4 (Confidential Binder) provides maps showing survey areas and historic resources. Maps have been updated to include the Bear Canyon Lease Addition. 820 acres of federal and private land were surveyed for the class two survey.

**Coal Resource and Geologic Information Maps**

Maps 6-1 through 6-12 have been updated to show the addition of the IBC to the permit area. [09212005] Maps have been updated to include the Bear Canyon Lease Addition.

**Cultural Resource Maps**

Chapter 4 (Confidential Binder) provides maps showing survey areas and historic resources.

**Existing Structures and Facilities Maps**

The only existing structure in the Wild Horse Ridge Area mentioned by the Permittee is a hunting cabin and the access road. Both are shown on Plate 2-4G and Plate 3-7G. The hunting cabin is labeled on Plate 3-7G, and an outline of the building is shown.

**Existing Surface Configuration Maps**

Plate 3-7F and Plate 3-7G show the existing surface topography.

**Mine Workings Maps**

The Permittee gave the Division maps that show the mine workings in the Blind Canyon Seam, Plate 5-1A, the Hiawatha Seam, Plate 5-1B and the Tank Seam, Plate 5-1C.

**Monitoring and Sampling Location Maps**

The MRP meets the requirements of the Environmental Resource Information regulations for Monitoring and Sampling Location Maps as provided in R645-301-731. The Division finds that these standards are met because of the information provided within the MRP. Plate 7-4, Water Monitoring, provides a depiction of all the active water (both surface and ground) monitoring and sampling locations utilized in producing baseline information. Plate 7-4 further identifies historical water monitoring sites (i.e. sites that are no longer active, but at one time were utilized to gather baseline data for the permit area).

**Permit Area Boundary Maps**

Plate 1-1, Permit Area, shows the location of the permit boundaries. The Division addressed the permit boundary maps in the permit area section of this technical analysis.

**Subsurface Water Resource Maps**

The MRP meets the hydrology Maps, Plans, and Cross Sections of Resource Information for Subsurface Water Resource Maps as provided in R645-301-722.100. Plate 7J-1, North-South Cross Section Bear Canyon Mine Area, depicts the potentiometric surface for all three tongues (Spring Canyon Tongue, Storrs Tongue and Panther Tongue) of the Star Point Sandstone. Plate 7J-2, General West East Cross Section East Portion of Federal Lease U-024316, depicts the

potentiometric surface of the Spring Canyon Sandstone. The Star Point Sand Stone is the geologic unit that contains the greatest quantity of water within and adjacent to the permit area. The Star Point Sandstone is of particular concern in light of its proximity and location directly below the Blackhawk Formation. The Permittee has provided adequate subsurface water resource maps to identify the potential for the Star Point Sandstone aquifer to be evaluated. Plate 7-12, Water Rights, depicts the water rights within and adjacent to the permit area. Plate 7-4, Water Monitoring, depicts the locations of springs and water wells within and adjacent to the permit area.

**Surface and Subsurface Manmade Features Maps**

These maps are included in chapter 5 of the current MRP.

**Surface and Subsurface Ownership Maps**

Plate 1-2 shows the surface ownership with the permit boundaries for the current permit area. Plate 1-3 shows the subsurface ownership with the permit boundaries for the current permit area.

**Surface Water Resource Maps**

The MRP meets the hydrology Maps, Plans, and Cross Sections of Resource Information for Surface Water Resource Maps as provided in R645-301-722.100. Plate 7-12, Water Rights, depicts the water rights within and adjacent to the permit area. Plate 7-4, Water Monitoring, depicts the locations of the surface water resources within and adjacent to the permit area.

**Vegetation Reference Area Maps**

Plate 3-1 illustrates the revegetation reference areas.

**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 premining contours. Plate 3-7G shows the premining contours extending 100 ft beyond the disturbed area boundaries. Plate 3-2G shows the postmining contours extending 100 ft beyond the disturbed area boundaries.

**Findings:**

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

# OPERATION PLAN

## MINING OPERATIONS AND FACILITIES

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

**Analysis:**

### General

C.W. Mining Company moved all coal mining operations in Bear Canyon from the west side of Bear Creek (#2 Mine sealed in 2002, the #3 Mine in December 2003) to the Wild Horse Ridge area in 2003. The #3 Mine, (Blind Canyon seam), and the #4 Mine (Tank seam) utilize continuous mining methods for the development of main and submain entries, and the extraction of pillars. The #4 Mine is developing longwall panels in the Mohrland addition as of January 2007.

### Type and Method of Mining Operations

"Development mining at the Bear Canyon complex is done utilizing continuous mining methods. Secondary extraction is conducted using both longwall (approved during 2007) and continuous mining pillar extraction. The continuous 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." In the longwall secondary extraction areas, a shearer cuts the coal from the face, discharging it onto an armored chain conveyor, which transports it to a stage loader / crusher. The stage loader discharges onto a conveyor belt, which transports the product out of the mine. The Permittee indicated during 2006 that a need to expand the tipple capacity and truck loading capability was necessary to take advantage of the increased production capability of the longwall method of secondary extraction. This permitting action will occur during 2007. If market conditions warrant, annual production will reach 2,500,000 tons per year.

### Facilities and Structures

A list of new structures associated with the Wild Horse Ridge disturbed area 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 technical analysis for more details.

Structures which had previously been associated with the Bear Canyon #1 and #2 Mines have been or are in the process of being reclaimed. Appendix 5-A has been updated accordingly.

**Findings:**

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

## EXISTING STRUCTURES

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

**Analysis:**

The MRP 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 CFR784.17; R645-301-411.

**Analysis:**

Historic resource 42EM1572 is within the permit area and is eligible for listing in the National Register of Historic Places. This site, however, is not within the disturbed area.

The Division received a letter from the State Historic Preservation Office concurring with the Division's determination that no historic resources would be affected for those areas inventoried within the current permit area.

There are no public parks within the permit area.

Maps have been updated to include the Bear Canyon Lease Addition. 820 acres of federal and private land were surveyed for the class three surveys.

**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.

**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 of this section of the regulations.

## AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, -301-420.

**Analysis:**

Permittee Appendix 4-D contains a copy of the Air Quality Approval Order DAQE-145-02 (AO). Section 423 of the plan indicates that the Permittee will water roads; drop points and storage piles as described in the AO.

DAQE-145-02 gives the Permittee approval 1.95 MTPY per 12-month rolling period. The approval of Task ID #2734, Bear Canyon Federal lease addition, U-46484 and U-61049, will authorize the use of longwall secondary extraction methods, which will increase the Permittee's anticipated tonnage projection to 2.5 MTPY. The Permittee has been informed by the DOGM that ***"C.W. Mining Company must amend the air quality approval order to allow for the increase in throughput to 2.5 MTPY. This document must be in place before the Permittee exceeds the approved 1.95 MTPY".***

**Findings:**

Information in the MRP is adequate to meet the requirements of the currently approved throughput of 1.95 MTPY. In order to increase the projected annual production to the anticipated 2.5 MTPY, the Permittee must amend the air quality AO through the Utah DEQ/Division of Air Quality.

## COAL RECOVERY

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

**Analysis:**

Coal recovery is addressed on page 5-14, **Recovery Rate** of the Task ID #2292 submittal. Utilizing continuous miner advance and retreat techniques, a seventy percent recovery rate has been determined. Table 5-1, Coal Reserves – Bear Canyon Mine lists the in place tonnage, as well as the recoverable tons for seven federal coal leases (U-46484, U-61048, U-61049, U-024316, U-024318, U-020668, and U-38727: lease U-024318 has been mined out and is not included in the current Bear Canyon Mine permit). Tonnages for the fee coal area are also listed.

Based upon information learned during a meeting with the USDOI / Bureau of Land Management / SLO on July 11, 2006, the coal reserves associated with Federal lease U-46484 are segregated on the east end of the lease by the Bear Canyon fault and several smaller faults. In order for that lease to be mined in a cost efficient manner, the Permittee must develop the underground workings such that the lease can be accessed from the north side. It is not known if the Permittee has any exploration data for the lease area. Page 5-15, as received on August 9, 2006, contains information relative to in place tonnage, as well as recoverable tons from Federal

lease U-46484. Thus, Table 5-1 has been updated to correctly include the recoverable tonnage (based upon knowledge available on July 11, 2006) to be mined.

The Permittee has provided a copy of the lease information for the 2,740 acres of fee coal owned by C.O. P. Coal Development Company. This agreement is included in the R2P2 information and is considered current.

The USDOI / BLM / Utah State Office provided the Division a copy of the R2P2 approval/modification letter for Federal coal leases U-61048, U-61049 and U-46484 on September 27, 2006. The approval letter was forwarded to the Office of Surface Mining in Denver, Colorado, with the following comments:

1) The R2P2 addresses all required items per 43 CFR 3482.1(b).
2) The BLM finds that the R2P2 complies with the Mineral Leasing Act of 1920, as amended, the lease terms and conditions, and the regulations in 43 CFR 3480.
3) The BLM has determined that maximum economic recovery of Federal coal will be achieved.
4) The BLM recommends that the Secretary of the Interior approved the R2P2 modification as part of the Federal mine plan approval.

Although the above information was not provided directly by the Permittee, the Division accepts the provided information as meeting the regulatory requirements of this section of the R645 Coal Mining Rules.

**Findings:**

The regulatory requirements of this section of the R645 Coal Mining Rules have been met.

## 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 Permittee 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, that large subsidence cracks similar to those that occurred on the Bear Canyon Ridge could also occur in the Wild Horse Ridge area, and that escarpment failure could damage

or destroy eagle nests. Since renewable resources were found in the area, the Permittee was required todevelop a subsidence control plan.

The Permittee has submitted three maps (Plate 7-4, Water Monitoring; Plate 7-12, Water Rights; and Plate 7N-2, Appendix 7N (water monitoring locations) depicting water monitoring locations as part of the Task ID #2597 submittal.

Plate 7N-2 depicts the water monitoring sites used for the Appendix 7N study, "Revised Hydrogeologic Evaluation of Bear Canyon Mine Permit and Proposed Expansion Areas".

Plate 7-12 depicts all of the State appropriated water rights held in the proposed lease addition. A revised Plate 7-12 was received on November 21, 2006.

Plate 7-12 is submitted at a scale of one-inch equals 1,000 feet, (or 1:12,000).

Pre-Subsidence surface contours are clearly shown.

There are no commercial buildings or residential dwellings depicted.

Water rights for the proposed lease addition are listed in Chapter 7, Table 7-6, Page 7-32. Quantity and quality information relative to these water sources is contained in the Utah DOGM water-monitoring database. The Permittee has committed to monitoring all water sources within the proposed permit addition.

**Subsidence Control Plan**

- The Permittee proposes to use room-and-pillar mining to extract all the coal in the Bear Canyon complex. The Permittee 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 Permittee 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 escarpment areas. Plate 3-4C shows where pillars will be left as part of the subsidence protection zone.

- The Permittee shows where second mining (pillar recovery) will occur on the mine maps. Areas marked panel or development will be first mined only. Areas that will be second mined are identified as pillar and development.

- The descriptions of the physical conditions that affect the likelihood or extent of subsidence are addressed in the geologic section of the technical analysis.

- The Permittee described the monitoring program in Appendix 3C in Section 5 of the amendment. The Permittee committed to installing 26 monitoring points in the Wild Horse Ridge area. The stations will be monitored yearly plus they 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 proven to be adequate.

- The Permittee proposes to protect sensitive surface features from subsidence by first mining only. The protected areas are marked on the Plate 3-3. The pillars in the subsidence protection zones have safety factors of 1.5. The Permittee quoted references indicating that subsidence should not occur if the pillar safety factor is at least 1.5. The reference is a NIOSH publication that the Permittee included in the MRP.

- The estimated amount of subsidence in the Blind Canyon Seam is 3.2 ft and subsidence in the Tank Seam is 4.1 ft. The maximum amount of subsidence in the Wild Horse Ridge area is 7.3 ft.

The Permittee described the measures that will be taken to mitigate or remedy any subsidence-related damage. The main item of concern is water replacement. The Permittee committed to purchase either water rights to replace damaged water rights, or to repair damage to existing rights. Should subsidence cracks occur, the Permittee will fill those cracks to the extent practical.

Appendix 5-C contains the subsidence monitoring and control plan and begins by discussing subsidence controls that have been implemented relative to secondary pillar extraction utilizing continuous mining methods. A revision added to page 5-16, section **R645-301-525** Subsidence Control Plan contains the following statement; "An escarpment stability and subsidence evaluation was performed by Malecki Technologies. This report calculated the maximum subsidence effects of longwall mining and then reduced them by 50% for room and pillar. In the areas where longwall mining will take place the maximum effects will be used." (See Page 13, bullet #3 of "Modeling of Castlegate Sandstone Escarpment Stability" by Maleki Technologies, Inc.) This report is included as Appendix 5Q."

Appendix 5Q contains a single document titled "Modeling of Castlegate Escarpment Stability" by Malecki Technologies, Inc., Consulting Mining and Geotechnical Engineers. The document evaluates surface subsidence in the Wild Horse Ridge addition of the Bear Canyon permit area. The affects of secondary coal extraction (room and pillar secondary extraction / CM methods) on the stability of the escarpments located in that area is also part of the evaluation.

In addition to continuous mining methods the approval of the Bear Canyon Federal Lease Addition (Task ID #2734) authorizes using the retreating longwall method of secondary coal extraction. Continuous mining will be used to develop both room and pillar and longwall secondary extraction areas.

The revisions submitted to the subsidence control and monitoring plan rely heavily on the report authored by Mr. Hamed Malecki, "Prediction of Surface Deformation Resulting From Longwall Mining Over the Bear Canyon Reserve". All surface deformation predictions are based on the "three-dimensional influence function method while accounting for site specific conditions" method of modeling used by Malecki Technologies, Inc., and an angle of draw of 22.5 degrees.

The USDOI/ /BLM-USO provided Resource Recovery and Protection Plan maps for the mining projections in the Tank Seam, the Blind Canyon Seam, and the Hiawatha Seam of the Federal lease addition. These maps are included as part of the Federal R2P2 approval. Plate LMU-3, CO-OP Mining Company, Tank Seam / B Seam Projected Mining, depicts the anticipated mine entry layout for the main entries, sub-main entries, pillar areas using continuous methods, protection barriers, and longwall secondary extraction areas. Overburden depths are shown using isopach lines.

Page 5C-9, **PROTECTION**, states that "in order to protect water resources and state appropriated water rights from impacts, C.W. Mining has designed their mine layout so that the areas where these resources exist with less than 900 feet of overburden between the resource and the coal, the resource will be outside of the affected area."

Chapter 5, page 5-18, **Protection of Natural Surface Structures,** lines 12 and 13 state that "adequate barrier zones will be left to protect adjacent stream channels, in Bear Creek and the forks of Fish Creek".

There are no impoundments or dams within the proposed lease addition that require protection.

Appendix 5-C describes what considerations the Permittee utilizes relative to the layout of the underground mine workings in order to minimize or prevent damage to surface areas where planned subsidence is not projected. These considerations may include:

1) Orientation of longwall and /or pillar panels to strike/dip of the seam.
2) Width of longwall panels.
3) The design of non-yielding pillars for bleeder and /or sub-main protection.
4) The design of yielding pillars for gate roads between adjacent longwall panels and their affect on the subsidence trough profile throughout.
5) The design of barriers to protect surface features requiring protection.

The Permittee does not project the use of barrier abutments between adjacent longwall panels for the purpose of ground control. The Division anticipates that it will be necessary for the Permittee to revise its Mine projection to implement barrier abutment pillars for the purpose of ground control when mining at depths near or in excess of 2,300 feet.

R645-301-525.410 requires that the Permittee include, as part of the method of underground extraction, a description of the method of underground mining including the size, sequence and timing of the development of the underground workings. This map must show when and where specific portions of the mine's workings will be developed and extracted. This map is also needed to ensure that surface property owners are properly notified at least six months in advance of mining in accordance with the requirements of R645-301-525.700.

The Permittee has submitted a projection of the proposed #4 Mine workings in the Tank seam (See PLATE 5-1C/ LMU-3). The first longwall panel to be extracted (TS LW 1) is depicted as being extracted from June of 2007 through September of 2007. This panel has dimensions of 4080 feet by 500 feet (face width).

Sequential longwall panels with their projected extraction dates are also depicted, as well as areas that will see primary development and secondary extraction via continuous mining methods.

R645-301-525.420 requires that the application contain a map of the underground workings that describes the location and extent of the areas in which planned-subsidence mining methods will be used, and that identifies all areas where the measures described in 525.440, 525.450, and 525.470 will be taken to prevent or minimize subsidence and subsidence related damage.

PLATES 5-1A, 5-1B, and 5-1C meet the requirements of 525.420 because the locations of barriers (support pillars of coal) which will be left, the locations where planned subsidence is to be implemented, and areas where pillar designs are implemented to prevent or minimize to the extent possible (i.e., yielding pillars in the gate roads) subsidence related damage are depicted. Barrier pillars between adjacent longwall panels are not being implemented as part of the current mining projection in the Tank seam.

Section **3.0 MINING, GEOLOGIC CONDITIONS AND SUBSIDENCE CHARACTERISTICS,** pages 7-11, (MTI report) describes the methods which the Permittee, through consultation with MTI, have implemented to reduce the potential for subsidence related cracking near the surface.

As described in **3.1, Conceptual Mine Layout Designs**, C.W. Mining engineers have oriented the longwall panels that are being proposed in the Federal lease addition on a bearing of N 55 degrees W. MTI determined in 2001 that major geologic joint sets have an orientation of either N 15 degrees W, or N 85 degrees W. Thus, the panel orientation varies at least 30 degrees from either of the major geologic joint sets (i.e., slip surfaces) in the area. Malecki Technologies, Inc., states that this offset alignment is beneficial for the stability of development workings because it avoids alignment of joints and mine openings. This 30-degree offset in the orientation of the longwall panels with the major joint sets also "increases its chances of limiting the number and length of mining induced surface fracturing at final mining boundaries".

MTI also states that this 30-degree variance in orientation is effective in reducing the potential for subsidence related cracking at the surface.

The second mining engineering design method utilized by C.W. Mining Company to minimize the potential for subsidence related damage to surface lands is the utilization of yielding pillars for gate road support. These yieldable pillars are developed on fifty-foot centers, utilizing three mine entries. Thus, two complete pillars are developed per cross-cut.

The size of the yielding pillars has been selected by the C.W. Mining staff in order to control gate road pillar bumps. The thirty-foot wide pillars will reduce the potential for strain energy accumulation. The size was selected, based upon successful experience in the East Mountain and Trail Mountain longwall operations (i.e., Energy West Mining Company).

These yieldable pillars have also been shown to collapse completely as the adjacent panels are extracted on retreat, rendering virtually no effect on the subsidence trough being generated. The tensile stresses that are cumulative over the gate road entries ("transient" subsidence, see page 5 of the MTI report) in adjacent panels crush out. This has been confirmed by Dyni, 1991. Thus, the subsidence trough is extended across adjacent panels until the width of the lease is extracted.

The use of barrier pillars to protect either critical areas of the underground workings or surface features which have been identified as needing protection is discussed on pages 5-16, and 5-17. A minimum barrier width of 100 feet is left to prevent the transfer of mining induced subsidence impacts "across boundaries and property adjacent to the permit boundary". The Permittee claims that this 100-foot width is adequate to protect property from subsidence effects transmitted via the influence of angle of draw within the area.

Mine main and sub-main entries are protected by barriers having a minimum width of 100 feet to assure protection of those entries for their usable life.

Outcrop protection is discussed on page 5-17 of the MRP. Outcrops in the Bear Canyon permit area are either buried under overburden, or are burned some distance from the surface. Where neither condition exists, the coal is weathered or oxidized, and its marketable quality is jeopardized. Mining is stopped within 200 feet of the surface to minimize the potential for this negative affect on Mine product, as well as to leave support for the outcrop area.

Barriers will not be left where natural surface features are over or adjacent to coal burn areas. It is not always possible to leave barriers directly beneath the feature. Coal burn may surround the area directly beneath the surface feature, or the surface feature may lie over the burnt coal/unburned coal interface. As coal burn material has no structural support, leaving a barrier here would "cause an interruption between the natural and man made subsidence causing greater impacts to the surface. Because of this, no barrier will be left in these areas unless it is needed for roof stability or temperature considerations (MSHA), in which case the minimum possible size will be used" (100 foot width).

The Division must note in this document that mining projections are changed regularly all through the coal industry. Therefore PLATES 5-1A, 5-1B and 5-1C may or may not be accurate by the time the Mines are developed.

**Performance Standards For Subsidence Control**

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

Page 5-18, **Protection of Natural Surface Structures & Streams** of the mining and reclamation plan discusses the methods to be utilized by the Permittee to protect escarpments, raptors, and down stream water quality. The Permittee has provided maps (PLATES 5-1A, 5-1B and 5-1C) that correlate the surface location of the areas to be protected with the underground workings, and how the protection area correlates with the extraction area.

**Notification**

The Permittee has provided projection maps of the #4 Mine workings depicting the anticipated dates when development mining will cross into the proposed lease additions. The Permittee has developed the information necessary to send the required notification letters to the surface owners in the time frame mandated under **R645-301-525.700.**

**Findings:**

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

## SLIDES AND OTHER DAMAGE

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

**Analysis:**

In case of a slide or other damage, the Permittee committed to notify the Division by the fastest possible method. The Permittee will repair the damage. If the Permittee 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 requirements of this section of the regulations.

## 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**

*Ungulates*

The Permittee must comply with exclusionary periods during construction and reclamation phases. The general exclusionary periods are December 1 through April 15 and May 15 through July 5. [09152005]

The deer and elk tended to winter and feed on the exposed ridge faces above the Wild Horse Ridge area. This surface facility site will disturb the big game habitat during the life of the mine. The Division, in consultation with DWR (Chris Colt; March 13, 2001), decided not to require mitigation for the big game habitat loss associated with the Wild Horse Ridge project.

This exclusion is for this project only. DWR sent the Division a follow-up letter restating this agreement on September 6, 2005.

The MRP includes design information for the Wild Horse conveyor. Conveyors can inhibit big game movement. Deer and elk, however, are known to cross under conveyors with clearances greater or equal to three ft. The Permittee designed the conveyor to provide a three-foot minimum clearance.

*Migratory Birds, Game Birds, and Raptors*

The Permittee must comply with raptor exclusionary periods during construction and reclamation phases. The general exclusionary periods are December 1 through April 15 and May 15 through July 5. [09152005]

Plate 5-3b illustrates known raptor nests in relation to planned subsidence.

Page 3-38 describes the protection of vegetative resources. The Permittee has committed to developing a mitigation plan with the Division and surface owner in the event vegetation is impacted by subsidence. The MRP includes subsidence and water monitoring plans that would reveal any substantial changes to vegetation or habitats of high value to wildlife. The overburden for the Tank Seam mining ranges from 400'-1400'. The lower overburden areas near the outcrops are also designated as buffer zones that will not be mined under. Subsidence is typically minimal with longwall mining in areas of approximately 1400' of cover. Wildlife populations are typically not affected unless their habitat is impacted by subsidence in which case the Permittee is monitoring the spring, pond and stream locations in areas of high value habitat. If monitoring of these areas indicates a loss in flow or change in the vegetative communities the Permittee has committed to implementing a mitigation plan that will restore the water and vegetation resources in those areas impacted.

*Plants*

The Permittee plans to collect seed from the local populations of canyon sweetvetch (sensitive species) and seed topsoil piles. The intent of this project is to generate a seed bank for final reclamation that includes this species. The sweet vetch was discovered prior to site development of the Wildhorse Ridge Facilities. [09122005]

**Endangered and Threatened Species**

The MRP includes a current list of Threatened and Endangered plant and wildlife species for the proposed lease addition areas as noted in paragraph two on page 3-28 of the May 22, 2006 submittal, and a narrative about the existence of those species listed for the county, (Emery), where the lease additions are located. According to the Division of Wildlife Resources,

(DWR), the only species of concern because of the relatively high elevation were the Townsend's Big Eared Bat and the Flamulated Owl for which a study was completed. The results of the study revealed that neither of the species occurred in the area. [03132007]

The Division, in consultation with USFWS, determined that the Wild Horse Ridge project and lease additions would not adversely affect listed or proposed threatened or endangered species with the possible exception of four listed fish species of the upper Colorado River basin.

*Colorado River Fish*

An adverse result of mining on water quantity to the Colorado River drainages affects four Colorado River endangered fish species (Colorado pikeminnow [squawfish], humpback chub, bonytail chub, and razorback sucker). The USFWS considers depletions or significant changes to contributions to the Colorado River drainage as a potential jeopardy to these endangered fish. The Permittee may have to mitigate if there are considerable changes to contributions or if water consumption is greater than 100 acre-ft per year. Currently, the mitigation fee is approximately $15.00 per acre-foot of depletion, but may change marginally from year to year. [09122005]

The Permittee provided the mass balance equation-parameters and total expected water loss from mining operations (Sec. 3-3.6). The amount of water loss expected from the Wildhorse Ridge mining operations is 36.2 acre-ft.

As noted in Chapter 7 page 7-45 and 46 the current and projected mining operations consume approximately 69 acre-feet of water per year. According to the U. S. F. W. S. this constitutes an adverse effect to the endangered fish species identified in the Colorado Fish Recovery Program. The permittee has included the criteria and calculations used to calculate this figure as well as calculations for mine water consumption in the proposed lease area additions. The figures have been revised in the current MRP to reflect projected mine water consumption in the longwall areas to be mined. These figures should be checked again when longwall mining operations commence in the new lease areas.

**Bald and Golden Eagles**

The Division, in consultation with USFWS and DWR, decided that construction of the Wild Horse Ridge facilities would adversely affect nesting raptors and eagle nests in the area. These agencies agreed that the Permittee must implement a mitigation project for the loss of nesting habitat near the Wild Horse Ridge area. The mitigation effort originally included artificial nests, and big game and raptor habitat enhancement. (Refer to the Division's TA SR98 (1)-5b for communication and decision details for this mitigation effort.)

The Division, in consultation with USFWS and DWR, decided to substitute the habitat enhancement project with a raptor prey base study. The reason for this change was that DWR did not know which plant species to use for the raptor prey habitat enhancement because it is unknown whether the high elevation raptors prey on high or lower elevation animals. The information gained could help the industry more accurately design seed mixes to increase prey populations. The Permittee has submitted a plan and implemented the prey base study for the Wild Horse Ridge area. [04022007]

As of 9/1/05, USFWS and DWR decided to remove the recommendation of installing artificial nests based on the success of these nests in the Huntington Canyon area. [09152005]

The Permittee predicts that mining operations could cause subsidence under four known raptor nests in the Mohrland area. The Permittee will monitor the nests at least 2 years prior (2006/07) and 1 year following undermining. The Permittee may need to protect these nests depending on the timing of undermining. The Division, in consultation with DWR and USFWS, will determine whether the Permittee must protect the nests. Results from the 2006 fly-over survey will help direct that determination. Protection could include chain-link fencing over the nest or some other agreed protection method. [09152005]

If the Division determines that mining could impact any of the four nests, the Permittee will provide a mitigation plan prior to the approval of the Mohrland permit. The Division will provide a determination immediately after the 2006 fly-over survey. [09152005]

One of the conditions to the Bear Canyon Lease Addition included the development of a raptor mitigation plan for Golden Eagle nests that may be impacted by subsidence. The plan was developed in cooperation with the wildlife buffer team, Co-op Mining Company and Derris Jones from Environmental Industrial Services Inc. The plan has been incorporated into the MRP and includes a ranking system and methodologies for deterring Golden Eagles from nesting during periods of potential subsidence.[11/26/2007]

There are no protection plans for transient bald eagles.

According to the 2006 raptor survey and data with the DWR Bald Eagles are not known to nest in the proposed lease area but may pass through the area during the winter months or periods of migration. The permittee has committed to conducting Raptor surveys yearly during the life of the mine.

Chapter three page 3-68 of the MRP includes a commitment to develop a raptor mitigation plan by July 1, 2007 in consultation with the DWR, DOGM, U. S. F. W. S., U. S. F. S. and BLM to mitigate impacts to nests and or raptors from potential escarpment failure caused by subsidence. A map of the 2006 DWR raptor survey with the nest site locations is included in the MRP as plate 5-3A. Plate 5-3A also shows that nests 902, 903, 904, 907, 908, 920 and 921,

are within the limits of predicted subsidence. The mitigation plan needs to include site-specific analysis of these nest sites and possibly others for potential loss due to escarpment failure. It should also be noted that C. W. Mining Company would need authorization from the Forest Service to mine under escarpment areas, (Federal Lease Stipulation #13). The permittee has also proposed to avoid mining activities in the panels during nesting periods. If unavoidable, obstructions such as fencing will be placed over the nest sites to prevent nesting. Additional alternatives will be included in the mitigation plan. This plan will cover raptor nests and habitat in addition to the 4 nests included in the Wildhorse Ridge mitigation plan.

**Wetlands and Habitats of Unusually High Value for Fish and Wildlife**

The Wild Horse Ridge project will not impact significant stands of wetland habitat. The Permittee covered the conveyor to help protect the drainage from coal fines.

With regard to the Bear Canyon lease additions, page 3-32 paragraph two, Section 322.220 of the MRP includes information that addresses this section of the regulations. The MRP includes an evaluation of the status of Habitats of high value for Fish and Wildlife for the lease addition areas and a discussion about the potential impacts from subsidence. They include springs, ponds and riparian areas as shown on plate 3-1. Due to the depth of cover no impacts are anticipated. However the Permittee has included these areas in their water-monitoring program and mitigation plan that addresses the replacement of water and vegetation resources should it be demonstrated that they have been impacted by subsidence activities.

**Findings:**

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

## TOPSOIL AND SUBSOIL

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

**Analysis:**

**Topsoil Removal and Storage**

The Permittee has recorded the storage of subsoil and topsoil in Table 2-5 as16, 134 $yd^3$ of topsoil and the 36,452 $yd^3$ of substitute topsoil, for a total of 52,586 $yd^3$.

Table 2-7 and Sec. 645-301-242 indicates that there are 28.03 acres of post-SMCRA disturbance, including Wild Horse Ridge and associated access roads.

Chapter 2, Soil Resources, R645-301-230 through R645-301-232.500 describing the removal, storage and protection of soils, and selected overburden materials or substitutes, and App. 5J, 5K and 5M are all pertinent to the discussion of the plan for topsoil salvage and protection during operations of the Wild Horse Ridge area. Five tables in the plan for the Wild Horse Ridge area are also key to the soil salvage activity:

Table 2-8, Substitute Topsoil Summary.
Table 2-2, Soil Unit Acreage Within the Disturbed Area.
Table 2-7, Reclamation Area Summary.
Table 2-9, Final Grading Test Sample Density.
Table 5K-1 and 5K-2, Summary of Cut and Fill Volumes.

The Permittee considers the Summary Table 2-7 as being the most accurate table in the plan.[1] All other Tables must reconcile with this one. Table 2-7 divides recontoured areas by operational areas and reclamation areas. Table 2-2 is specific to the Wild Horse Ridge and divides recontour acres by soil type within the 3.6 acre Wild Horse Ridge disturbance. Table 2-8 provides a summary of topsoil and subsoil stored at the site.

In Table 2-7, the Permittee itemizes 40.27 acres of disturbed area. In Tables 2-5 and 2-8, the Permittee summarizes the available topsoil and substitute topsoil for the 40.27 acres as approximately 52,000 $yd^3$.

**Topsoil and Subsoil Removal**

*Wild Horse Ridge*

Wild Horse Ridge topsoil salvage areas are identified on the Soil Suitability Map C, Appendix 2-F, Order 1 Soil Survey. Cut and fill volumes are located in Tables 5J-1, 5K-1 and 5K-2 of Appendix 5K, Wild Horse Ridge Tank Seam Access Roads and Appendix 5J, Wild Horse Ridge Blind Canyon Seam Pad and Conveyor Access Roads.

For Wild Horse Ridge, Table 5J-1 estimates that 8,700 $yd^3$ of topsoil was salvaged from the lower conveyor access road, the upper conveyor access road, and the Blind Canyon seam portal pad. The topsoil is shown on Plate 2-2B, WHR Topsoil Stockpile and Plate 7-1F, Hydrology Map. Section 645-301-231.400 indicates that the soil below the stockpile (Doney soil, map unit D) could provide an additional 2, 354 $yd^3$ of topsoil for Wild Horse Ridge during

[1] Personal communication with Charles Reynolds during site visit 3/23/01.

reclamation. This potential additional soil is included in the 11,054 $yd^3$ total listed as available for Wild Horse Ridge in Summary Table 2-8.

Table 2-3 and 2-2 also project that approximately 11,049 $yd^3$ of soil are stockpiled for reclamation of the Wild Horse Ridge area (soils with symbols PC, WIN, WR, DON, DG, GP, DCP).

In Table 2-7, reclamation areas for the Wild Horse Ridge are labeled TS-12, TS-13, TS-14, and TS-15. Table 2-7 itemizes the acreage to be reclaimed within each area and acreage to be graded within each of these areas. According to Table 2-7, 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 have soil salvaged and require recontouring during reclamation (Tables 2-2 and 2-7). 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.

The Permittee states supervisory personnel will be present during topsoil salvage to direct the salvage. Supervisors 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*

Soil salvage will be between 10 and 40 inches based on the Order I soil survey, App. 2-F. 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). During road construction described in Sec. 645-301-527, the top ten inches of this soil will be salvaged and placed in the topsoil pile. The subsoil will be used as road base.

Section R645-301-231, 400, states that topsoil will be salvaged from all areas accessible by equipment, including soils with high rock content.

The main idea is that native soils with a higher intrinsic rock content than the 1988 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 raindrop impact and resulting soil surface erosion.
4. Create wildlife habitat niches.
5. Create microclimates for plant establishment and vegetation survival.

**Topsoil Storage**

Wild Horse Ridge topsoil pile is estimated as containing the 8,700 $yd^3$ of salvaged soils and 2,354 $yd^3$ of soil beneath the pile (in-place) for a total of 11,054 $yd^3$ of soil. The native, undisturbed soil was demarcated by permeable fabric strips placed over the soil surface prior to formation of the stockpile (see Section 645-301-231.400, Plate 2-1B, and Plate 5-2F).

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 ft in elevation and 20 ft distant from the ephemeral drainage. The topsoil stockpile will be surrounded with a containment berm and protected as discussed in Section R645-301-234.

Prior to construction on the shower house pad, topsoil was salvaged and stockpiled. The final topsoil stockpile consisted of 1,200 $yd^3$. This topsoil was relocated to the Wild Horse Ridge topsoil stockpile (Plate 2-2B).

Approximately 1,000 yd3 of topsoil was salvaged and stockpiled from the Bear Canyon Mine Tank Seam access road during construction. During construction of the Wild Horse Ridge area, this topsoil was also relocated from the upper storage pad to the Wild Horse Ridge topsoil stockpile (Plate 2-2B).

The Wild Horse Ridge topsoil stockpile is detailed on Plate 2-2B which shows the projected stockpile, size, placement, final configuration and cross sections. According to Plate 2-2B, 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 5J, Fig.5J-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 2-2B.

**Findings:**

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

## VEGETATION

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

**Analysis:**

Appendix 3G includes a plan for interim revegetation. The plan includes to drill or broadcast seed (Table 3-3), apply 1500-2000 pounds per acre of wood fiber hydromulch with a tackifier. The seed mix has one species that is not native. The Permittee will monitor interim revegetation sites and reseed when necessary.

The following paragraph addresses vegetation requirements for the addition of the Bear Canyon Leases.

Page 3-38 describes the protection of vegetative resources. The Permittee has committed to developing a mitigation plan with the Division and surface owner in the event vegetation is impacted by subsidence. The MRP includes subsidence and water monitoring plans that would reveal any substantial changes to vegetation or habitats of high value to Wildlife. See protection an enhancement plan under Fish and Wildlife Information section. The mitigation plan for these types of impacts is also described in appendix 5C and chapter 7 .

**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 permit MRP package 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 ft 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 ft long and has an average grade of 10%. The upper road is approximately 590 ft 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 as certified the roads.

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

The addition of Federal Leases U-61048, U-61049, U-46484, U-024316 and the Mohrland Fee Area did not necessitate the construction of new roads.

**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 to do bond calculations.

In Appendix 3-O, the Permittee shows a detailed plan for the construction and reclamation of the roads. In Section 3.6.12 of the amendment, the Permittee 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 ft to 5 ft in diameter), the lifts will be a maximum of 36 in. The fill will be compacted with earthmoving equipment. The Permittee and its consultant do not believe that conventional compaction equipment will work at the site. Therefore, compaction will be done with earth moving equipment.

The Division recommends that the Permittee use a maximum lift thickness of 8 in. 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 Permittee 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 Permittee 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 Permittee 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 in Attachment 2 of Appendix 3-O show cuts and fills. The Division will use those cross-sections 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 Permittee will be minimizing erosion. Since the roads must be constructed in a narrow canyon, the Permittee 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 Permittee 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 to minimize fugitive coal dust emissions. The R645 rules have few design specifications for conveyor systems. The Division reviewed the conveyor plans and found that they meet the engineering requirements. See Appendix 7K Page13 for information on dust control.

**Findings:**

Information provided in the MRP 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 Mine Wastes**

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.

The Permittee experienced an unanticipated roof fall in the 1st North section of the Bear Canyon #1 Mine on January 14, 2003 that buried a battery-powered coal hauler, an electrical distribution box, and a shop trailer. Appendix 7-P contains information on the abandoned equipment, including Material Safety Data Sheets (MSDS) for the lubricants and hydraulic fluid, battery electrolyte, and lead contained in the DC power cells. Plate 7-10B, a PE certified map of the #1 Mine, shows where the equipment is buried. Plate 7-10B also shows floor seeps and roof drippers, vertical boreholes that connect the Hiawatha seam with the overlying Blind Canyon seam, areas of the 1st North section where water collects near the buried machinery, and mine water discharge lines.

The Permittee reported this accident to the USEPA and also notified other state, federal, and local agencies. On May 27 and 28, 2004, the Division's PFO confirmed the receipt of that

letter by each agency. The Permittee faxed a copy of the notification letter to the Division on May 28, 2004. [06072005]

**Coal Mine Waste**

Sediment pond clean out is described in Appendix 5O. A maximum of 150 cu yd of coal mine waste will be temporarily stored on the main storage pad shown on Plate 5-2C. The material will not be stored at that site for more than 15 days. The Permittee will keep logs recording 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.

Waste rock from the Wild Horse Ridge will be hauled to Hiawatha slurry pond 5A. Prior to being hauled it will be tested according to Table 5O-1 of Appendix 5O. The Hiawatha plan has been amended to allow for this activity.

In the event the coal mine waste should catch fire, the Permittee will extinguish the material by spreading it out on the surface and allowing the material to burn out and/or distinguishing the fire with water.

**Refuse Piles**

The Permittee does not propose to construct a refuse pile. All refuse (coal mine waste) will be disposed of underground (pending MSHA and Division approval) or at the Hiawatha Mine.

The Division has approved the disposal of coal mine waste at Hiawatha's Pond No. 5A.

**Impounding Structures**

The Permittee does not propose constructing any impoundments utilizing coal mine waste as the construction material.

**Burning And Burned Waste Utilization**

In Section 528.323, the Permittee states a plan for extinguishing potential fires in the waste rock pile.

**Return of Coal Processing Waste to Abandoned Underground Workings**

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

**Excess Spoil**

The Permittee does not plan on generating any excess spoil.

**Findings:**

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

## 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, -300-147, -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:**

**General**

The MRP meets the requirements for General Hydrologic Information as provided in R645-301-731.

The MRP includes operational ground-water and surface-water monitoring plans based upon the PHC determination and the analysis of baseline hydrologic and geologic information in the permit application. These plans provide for the monitoring of parameters that relate to the suitability of surface and ground water for current and approved post mining land uses and to the objectives for protection of the hydrologic balance, as well as the effluent limitations found at 40 CFR Part 434. They identify the quantity and quality parameters to be monitored, sampling frequency, and site locations.

The locations of operational monitoring stations are depicted on Plate 7-4, Water Monitoring. Table 7-14, Water Monitoring Matrix: Operational Phase of Mining, lists all of the ground and surface water sites that will be monitored during mining operations.

Table 7-12, Ground Water Sampling, provides an overview of the ground water sampling for the baseline, operational and post mining phases of the mine. Table 7-13, Ground Water Quality Parameter List, provides a list of the ground water quality parameters to be analyzed.

Table 7-16, Surface Water Sampling, provides an overview of the surface water sampling for the baseline, operational and post mining phases of the mine. Table 7-17, Surface Water Quality Parameter List, provides a list of the ground water quality parameters to be analyzed.

On page 7-61A, the Permittee provides a list of the hydrologic resources that have been identified as Protected Waters by the USDA Forest Service. A map depicting these protected waters is provided on page 7-61B.

The hydrologic monitoring parameters have been selected in consultation with UDOGM directive Tech-004.

The water discharged from the mine through SBC-9A is the culinary water supply for the Bear Canyon Mine. The MRP includes a description of the installation of the 6-inch diameter polypropylene pipeline that continuously drains ground water from the area of the abandoned mine equipment. Plate 7-10B shows the location and routing of the pipeline. Figure 7P-1 is a typical cross-section of the cribbed pipeline installation. [06072005]

**Surface And Groundwater Monitoring**

Table 7-12 and Table 7-16 provide detailed information regarding Baseline, Operational and Post-mining water monitoring for ground and surface water respectively. The Permittee has committed to obtaining three years of baseline data prior to mining in a given area. The Permittee states that operational monitoring will involve continued monitoring every year until two years after surface reclamation activities have ceased, and that the sites will be monitored four times annually. The tables also provide descriptions as to the types of data that will be collected as well as their respective reporting requirements.

Table 7-14 on page 7-53 "Water Monitoring Matrix: Operational Phase of Mining" lists the streams, springs and monitoring wells that will be monitored as well as the proposed monitoring schedule. The proposed monitoring program is based on the PHC analysis compiled in Appendix 7-J. Based on this, the Permittee has proposed an adequate ground and surface water-monitoring program. All of the sites listed on table 7-14 are depicted on Plate 7-4 Water Monitoring.

Stakeholders identified several water resource sites during the expansion of the permit area into Federal Leases U-61048, U-61049, U-46484, U-024316 and the Mohrland Fee surface (during sit down discussions as well as field visits). The Permittee incorporated these additional sites into the water-monitoring program. These sites include: springs SBC-16A and SBC-16B located in T 16S R8E Sect 13 NE ¼ NW ¼, Wild Horse Spring (SBC-22) located in T 16S R7E Sect 13 SE ¼ SE ¼ and Bear Canyon Spring (SMH-5) located in T 16S R7E Sect 12 NE ¼ SW ¼. These additional sites are listed in Table 7-14 as well as depicted on Plate 7-4.

On page 7-60A, the Permittee describes the surface and groundwater monitoring procedures that will be utilized during undermining of the upper reaches of the Left and Right Forks of Fish Creek. The Permittee has committed to weekly monitoring of the areas one month

prior to mining in the area. The weekly monitoring will continue until one month after mining has left the area. Monitoring will then be reduced to once a month after mining activities have passed the area. Monitoring will then be reduced to once a month for an additional 6 months at which time, monitoring will fall back to a quarterly schedule. During the weekly monitoring, the Permittee will submit weekly reports to the Division via e-mail. The actual start time of the weekly monitoring will be determined based on continual underground surveying that is required by MSHA.

Eight sites have been identified for weekly monitoring during the undermining phase of the Left Fork of Fish Creek. Five sites have been slated for weekly monitoring on the Right Fork of Fish Creek. See Table 7-14 for a listing of the sites and Plate 7-4 for their respective locations. The sites slated for weekly monitoring on each of the drainages encompass both surface and groundwater sampling sites. In addition, upon field inspections, areas where perennial flow began for both the Left and Right Forks of Fish Creek were focused on and representative sampling sites in these areas were incorporated into the weekly monitoring program. The increased monitoring will include sites FC-2, FC-3, FC-4, FC-5 and SCC-2 for the Right Fork of Fish Creek. The Left Fork of Fish Creeks weekly monitoring sites include SBC-16, SBC-16A, SBC-16B FC-1, FC-6, SBC-18, SBC-20 and SBC-21.

**Groundwater Monitoring**

The MRP meets the hydrology Operation Plan requirements for Ground Water Monitoring as provided in R645-301-731.210. The Division finds that these standards are met because the ground water monitoring plan is based on the PHC determinations provided in Appendix 7-J.

Plate 7-4 depicts the current and proposed monitoring sites. Upon comparing Plate 7-4 with the mine workings maps (Plate 5-1A Blind Canyon Seam Workings, Plate 5-1B Hiawatha Seam Workings and Plate 5-1C Tank Seam Workings) and upon several field visits in the proposed lease expansion, the Permittee has produced a monitoring plan that will adequately quantify and monitor groundwater resources in the proposed lease expansion as well as in adjacent areas.

Table 7-12 on page 7-51 provides an overview of the ground water sampling program to be utilized during baseline monitoring, operational mining as well as post-mining monitoring. Table 7-13 on page 7-52 provides a list of the ground water quality parameters that will be analyzed for during the monitoring program. Table 7-14 on page 7-53 provides a comprehensive list of the groundwater monitoring sites (springs and monitoring wells) to be monitored during the operational phase of mining. Plate 7-4 depicts the locations of the current and proposed monitoring site locations.

The Permittee has committed to sampling numerous ground water sites with the increased monitoring protocol outlined on page 7-60A, Undermining of Perennial Streams. Page 7-60A details the increased monitoring to be performed during the undermining of the Left and Right Fork of Fish Creek. Ground water sites included in this increased monitoring schedule include SBC-16, SBC-16A, SBC-16B, SBC-18, SBC-20, SBC-21 and SCC-2. Table 7-14, Water Monitoring Matrix: Operational Phase of Mining on page 7-53 denotes all sites slated for increased monitoring during the undermining of perennial drainages with a footnote.

Additionally, the Permittee has committed to monitor additional sites identified by the USDA Forest Service as protected waters. On page 7-61B the Permittee provides a map (Figure 7-0: Forest Service Protected Water Resources) that depicts the names and locations of these protected waters. Page 7-61A provides a table of the protected water resources with their respective Forest Service names and corresponding water monitoring site names. Upon consultation with Forest Service personnel, the Permittee agreed to monitor the South McCadden Trough spring located in T 16S R7E SE ¼ of the SW ¼ of Section 11 (site SMH-3 as depicted on Plate 7-4) and historical monitoring site FBC-12 located in T16 S R7E NW ¼ of Section 13 (site SBC-23 as depicted on Plate 7-4). The Permittee has also corrected an error identified on Plate 7-4 in the previous analysis. Historical monitoring site SBC-12 (16-7-13-1) was incorrectly depicted in two locations. It is now correctly depicted on Plate 7-4.

Groundwater monitoring sites were selected because they were either major contributors to surface water systems, or they were springs that have been developed for beneficial use or have water rights assigned to them. The major contributors to surface water systems in the proposed lease expansion are SBC-16, SBC-16A, SBC-16B, SMH-3, SMH-4, SBC-12, SBC-18, SBC-20, SBC-21, SCC-1, SCC-3 and SCC-5. Perennial portions of the streams fed by sites SBC-16, SBC-16A, SBC-16B, SBC-18, SCC-2, SBC-20 and SBC-21 will be undermined. As such, these sites will be monitored for flow weekly starting one month prior to undermining and continuing until one month after undermining at which time they will be monitored monthly for six months before returning back to quarterly monitoring. See Table 7-14. (See previous paragraph's comments regarding sites to be added to the increased monitoring schedule during the undermining of perennial streams)

Various stakeholders identified several groundwater resource sites during this process (during sit down discussions as well as field visits) that weren't initially included in the proposed monitoring plan. The Permittee has incorporated these additional sites into their proposed water-monitoring program. These sites include: springs SBC-16A and SBC-16B located in T 16S R8E Sect 13 NE ¼ NW ¼, Wild Horse Spring (SBC-22) located in T 16S R7E Sect 13 SE ¼ SE ¼ and Bear Canyon Spring (SMH-5) located in T 16S R7E Sect 12 NE ¼ SW ¼. These additional sites are listed in Table 7-14 as well as depicted on Plate 7-4.

On March 22, 2000, an order from the Division required the Permittee to modify the permit MRP by including "portions of the February 21, 2000 letter 'Responses to concerns of

Castle Valley Special Services District' from Mayo and Associates, LC to Charles Reynolds, Co-Op." That requirement was complied with by inclusion of the letter in Appendix 7-J. A second requirement of that Division Order was to include " a minimum of one in-mine drill hole in the northern portion of the Wild Horse Ridge Addition." That requirement was complied with by addition of monitoring well DH-5 shown on Plate 3-4C. The well is located at the northern boundary of the mine addition. The drill hole "will be tested using the same methodology which was used in the previous in-mine wells, described in Appendix 7-N." [01/09/2006]

**Surface Water Monitoring**

The MRP meets the hydrology Operation Plan requirements for Surface Water Monitoring as provided in R645-301-731.220. The Division finds that these standards are met because the groundwater-monitoring plan in the MRP was based on PHC determinations found in Appendix 7-J. Surface water monitoring sites were selected based on the conclusions of Appendix 7J (PHC determination document) as well as upon the field investigations by regulating agencies and various stakeholders during the course of the permitting process.

Table 7-14A, Surface Water Monitoring Matrix: Baseline Collection, located on page 7-53A lists the surface water sites that will be utilized for baseline data collection. Page 7-57 provides a comprehensive list of the surface water monitoring sites and their corresponding site name. Table 7-16, Surface Water Sampling, on page 7-58 provides an overview of the surface water sampling program to be utilized during baseline monitoring, operational mining as well as post-mining monitoring. Table 7-17 on page 7-59 provides a list of the surface water quality parameters that will be analyzed for during the monitoring program. Table 7-14 Water Monitoring Matrix: Operational Phase of Mining on page 7-53 provides a comprehensive list of all the proposed monitoring sites. Plate 7-4, Water Monitoring, depicts the locations of the monitoring sites.

As discussed by the Permittee, representatives of the USDA Forest Service and the Division on August 31, 2006, a surface water-sampling site (MH-2 as depicted on Plate 7-4) was established in the upper reach of McCadden Hollow. It was agreed upon by the respective agencies and the Permittee that the MH-2 would be located up-stream of SMH-4 and south of historical monitoring site 16-7-12-6. The site has been added to Table 7-14, Water Monitoring Matrix, as well as to the list of proposed surface water monitoring sites listed on page 7-57 of the MRP.

Page 7-57 lists the streams that will be monitored during the operational phase of the mining activity. Ten additional surface water-monitoring sites were incorporated into the proposed monitoring program as a result of the lease expansion into Federal Leases U-61048, U-61049, U-46484, U-024316 and the Mohrland Fee area. Two sites were added to Cedar Creek (CK-1 and CK-2) with four additional sites added to the Right Fork of Fish Creek (FC-2, FC-3,

FC-4 and FC-5), three additional sites added to the Left Fork of Fish Creek (FC-6, FC-7 and FC-8) and one additional site on the upper reaches of McCadden Hollow.

Flows of perennial streams will be determined by direct measurement (depth times width times 2/3 velocity), by use of portable or stationary weirs or flumes. Qualified personnel following standard procedures with calibrated instruments will take measurements.

**Replacement of State Appropriated Water Supply**

The MRP meets the hydrology Operation Plan requirements for Replacement of State Appropriated Water Supply as provided in R645-301-731.530. The Division finds that these standards are met because beginning on page 7-61 and continuing through page 7-61F, the Permittee outlines the measures and mitigation efforts that will be utilized in the event that a state appropriated water supply is impacted by mining activity. On page 7-61, the Permittee states, "If a state appropriated water supply is impacted by mining and/or mining related activities, C.W. Mining will replace it as required under R645-301-731.530 of the Utah State Code. Also in accordance with federal lease stipulation 21, if any water resource that has been identified for protection is impacted, C.W. Mining will replace the water resource". The Permittee provides the locations for state appropriated water rights with points of diversion within the proposed permit expansion area on Plate 7-12. Figure 7-0 on page 7-61B depicts the water resources identified for protection by the U.S. Forest Service. In addition, on page 7-48 of the submittal, the Permittee states, "If any state appropriated water rights are impacted in the future, C.W. Mining will meet with the water right holder and the Division and develop a site specific water replacement plan".

The Permittee identifies C.O.P. Coal Development, ANR Inc., the United States Forest Service and Huntington, Cleveland Irrigation Company (HCIC) as the primary water rights holders that could potentially be impacted by underground mining activity. On page 7-61C, the Permittee provides a discussion as to possible measures and mitigation efforts that could be taken in the event that a state appropriated water right held by one of the aforementioned water right holders is impacted by mining activity.

Mitigation efforts in relation to USDA Forest service water rights are discussed on page 7-61D. The Permittee indicates, "because of the nature of their use, if these water rights were impacted, the Forest Service would need the water to be restored to the original location." As discussed during the permitting process, the USDA Forest Service would, in all likelihood, require that their water replaced at the source of the flow in the event that there were mining related impacts. The Permittee commits to utilizing pond liners, grouting or other technologies available to repair any cracks that could potentially impact water resources. The Permittee commits to replacing the water at its source. If the impact was a displaced spring, the Permittee has committed to installing guzzlers, wells or other available technology to restore the water.

On page 7-61E, the Permittee discusses possible mitigation efforts in the event that HCIC's water rights are impacted. HCIC's points of diversion for their state appropriated water rights are located downstream of the subsidence area. Because of this, the stock-watering and irrigation uses for HCIC may not require replacement at the source of the flow. HCIC has indicated; however, that they would require the same quantity of water to reach their points of diversions. The Permittee states, "If stock watering or irrigation water were impacted, C.W. Mining would transfer or retire enough of their shares in HCIC to cover the lost water, or any course of action agreed upon between C.W. Mining and HCIC". The Permittee commits to replacing lost flow with equivalent flow from existing springs that they hold water rights on.

On page 7-61F, the Permittee indicates that the requirement to replace or mitigate state appropriated water rights, would be contingent upon the Division finding that the mining activity had contaminated, diminished or interrupted said water rights.

**Acid- and Toxic-Forming Materials and Underground Development Waste**

Section 542.200 refers the reader to Appendix 5D and Appendix 6C for acid toxic information. Appendix 5D Toxic Materials & Handling provides limited information on the characteristics of soil, coal and sediment pond sludge through 1989. Appendix 6C Coal & Rock Characteristics has samples of roof and floor through 1995 and includes samples analyzed in January 2003 of the roof; floor, coal, and sediment pond clean out. The mine roof RM1 samples show that the coal has a pH of 3.7, no neutralization capacity and boron content of 10 ppm.

Additional sampling was conducted in 2004 that has not been added to Appendix 6C as of 04/02/2007.

**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 mines is located along the conveyor. This water is to be used for a bathhouse, 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 From Underground Mines**

No gravity discharges are expected for the Wild Horse Ridge mines, Bear Canyon No. 3 or No. 4.

**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.

Monitoring of the mine discharge will continue for the life of the mine (Appendix 7-P). Potential contaminants from the abandoned equipment are identified in Appendix 7P, and copies of the MSDSs are in Appendix 7-P. Water not consumed by culinary uses and mine operations is discharged to the stream in Bear Canyon under the UPDES permit. [06072005]

**Diversions: General**

Diversion designs are provided for the 10-year, 6-hour event. The Permittee committed to maintain the minimum required cross sectional area. Freeboard was presented to be 0.30 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.

*Road Drainage*

The Permittee 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 that may result in maintenance problems due to sediment settling out in the ditch. As of 2/12/2007 the information on plate 7-1F did not show the installation of a culvert in that location.

**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 is provided in Appendix 7-O.

**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 (Appendix 3-O). 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 outslope of the Blind Canyon Seam portal pad fill (Appendix 3-O).

Discussions related to culvert placement and pad and operational construction in the drainages are detailed. The MRP states that, "Following initial pad contouring the sediment pond will be constructed followed by road crowning and ditch and culvert placement." (Appendix 3-O). More construction detail is contained in Appendix 3-O. 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. It contains a small population of the Forest Service Region 4 sensitive species Link Trail columbine. A site visit by the Division evaluation team followed by discussions with the Permittee resulted in a commitment (Appendix 3-O) 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 controls for areas V and W. The BTCA for 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 area W includes the conveyor belt areas. A silt fence will be placed down slope during construction, and it will 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, 6-hour 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: General**

See: Sedimentation Ponds.

**Siltation Structures: Sedimentation Ponds**

The Wild Horse Ridge area includes designs for sedimentation pond D. All runoff from the portal pad area reports to this 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 the 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 cleanout 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% cleanout level. The cleanout 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 rock size is six inches and appears appropriately designed. A fuel tank is located about

100 ft 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 has been completed. Full containment berms around fuel tanks are standard on the rest of the site, and has been included for this one.

**Siltation Structures: Other Treatment Facilities**

No Other Treatment Facilities are proposed.

**Siltation Structures: Exemptions**

No exemption from siltation structures are proposed.

**Discharge Structures**

Discharge structures are designed to minimize erosion.

**Impoundments**

The only new impoundment associated with the Wild Horse Ridge addition is Pond D. Since the pond will be removed during reclamation, the pond is considered temporary. Therefore the requirements that apply specifically to permanent ponds do not apply.

The size and height of the impoundment may require the pond to meet additional design requirements. Such ponds are unofficially called MSHA ponds.

The following requirements apply to both temporary and permanent impoundments:

- MSHA requires that all impoundments meet additional standards if the pond 1) impounds water to an elevation of 5 ft or more above the upstream toe of the structure and can have a storage volume of 20 acre-ft or more; or (2) impound water to an elevation of 20 ft or more above the upstream toe of the structure; or (3) as determined by the district manager. Pond D has a maximum storage capacity of 4,113 $ft^3$ (0.094 acre-ft), 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 ft. The pond does not qualify as an MSHA pond.

- Plate 7-11 shows the plans and cross sections for Pond D. The plans have been certified by Charles Reynolds, a registered professional engineer.

- Dames and Moore conducted a stability analysis for the Portal Staging Area sedimentation pond. 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 pond is required to have a minimum static safety factor of 1.3.

- The Division and the Permittee used STABLE, a slope stability program, to determine that the pond would be stable under rapid drawdown conditions.
- No highwalls are associated with Pond D.
- The Division will review the inspection reports for Pond D during some monthly inspections, all complete inspections, and during the review of annual reports.

**Ponds, Impoundments, Banks, Dams, and Embankments**

**Casing and sealing of wells**

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

**Findings:**

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

## SUPPORT FACILITIES AND UTILITY INSTALLATIONS

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

**Analysis:**

The Permittee 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 conveyor 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.

**Findings:**

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

## SIGNS AND MARKERS

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

**Analysis:**

R645-301-521.200 requires the Permittee to post (1) mine and permit identification signs, (2) perimeter markers signs and (3) topsoil marker signs. The Permittee has committed to and placed those signs as 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 MRP is adequate to meet the requirements of this section of the regulations.

## USE OF EXPLOSIVES

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

**Analysis:**

**General Requirements**

A blast design is submitted as Appendix 3-M that describes a blasting plan for the construction of the conveyor access roads associated with the Wild Horse Ridge addition that 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 issued 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 ft of the proposed Wild Horse Ridge blasting area. No other buildings exist within 1,000 ft of the proposed Wild Horse Ridge blasting areas. Although a hunting cabin exists approximately 750 ft from the nearest proposed blasting area, the building cannot be

classified as a dwelling or as a public building, (school, church, etc.). Although the Permittee's response does contain an anticipated blast design, it was not necessary to submit it. Regulations R645-301-524.210 through -524.212 have been adequately addressed. The anticipated blast design that has been submitted appears to be able to successfully meet the fragmentation requirements being sought without incurring significant damage to the surrounding environment.

The Permittee'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 will have the proper diameter for safe blasting.

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 DOGM approval for minor changes in powder factor.

**Findings:**

Information provided in the MRP 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**

The affected area is shown on Plate 5-2C.

**Mining Facilities Maps**

Plates 5-2A through 5-2H are contained in the Bear Canyon reformatted mining and reclamation plan, and have been approved and incorporated by the DOGM.

**Mine Workings Maps**

Mine workings are depicted on Plates 5-1A and 5-1C for the Blind Canyon seam (#3 Mine) and the Tank seam (#4 Mine) respectively. The Plates that have been re-submitted as part of Task ID #2680 are certified by a Utah registered professional engineer.

Plates 5-1A and 5-1C show the anticipated dates of secondary extraction for the mining sections in the Blind Canyon and Tank seams respectively.

**Monitoring and Sampling Location Maps**

The MRP meets the requirements for Monitoring and Sampling Location Maps as provided in R645-301-731.

Plate 7-4, Water Monitoring, depicts the ground and surface water monitoring points. Plate 7-12, Water Rights, depicts the state appropriated water rights that have been identified in the Utah Division of Water Rights Database, as well as water resources identified during field investigations. The water rights plate depicts the points of diversion associated with the specific water rights.

On page 7-61B, Figure 7-0: Forest Service Protected Water Resources depicts the locations of the water resources that have been deemed "protected" by the USDA Forest Service.

During an August 22nd, 2006 site visit, water users/stakeholders identified several hydrologic resource sites of concern. These sites included: Wild Horse Spring (SBC-22) in T16S R7E Sect 13 SE1/4, two springs identified in the field as SBC-16A and SBC-16B (T16S R8E Sect 19 NE1/4 NW1/4) and the spring (SMH-5) located in T16S R7E Sect 12 NW1/4 SE1/4. These sites are depicted on Plate 7-4 as active monitoring sites.

It is the understanding of the Division that the State of Utah Water Rights Division is compiling an addendum to the state appropriated water rights in the area. During field investigations, several water resources have been discovered that did not have a water right associated with them in the Water Rights Division database. Once the addendum process is

completed, a more complete list of water rights in the proposed lease expansion may be compiled.

Plates 7-4A, Spring Canyon Potentiometric Surface, 7N-2, Water Sampling Locations and 7-4, Water Monitoring have been submitted as part of the Task ID #2680 application.

Plate 5-3, Subsidence Map depicts subsidence monitoring station locations, escarpment locations, potential subsidence zones, and mine workings for the #1 and #2 Bear Canyon Mines. Mine workings for the #3 and #4 active mines are also shown.

**Certification Requirements**

All plates that require certification (as required by R645-301-512) have been certified by a Utah registered professional engineer.

**Findings:**

Information provided in the MRP 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 says, "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,". 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 ft high with the maximum at one location of 30 ft. 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. The #4 Mine auxiliary portal will be backfilled from inside the Tank seam workings, as described in APPENDIX 3-Q. [01/09/2006]

**Findings:**

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

## 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 current postmining land use includes grazing, wildlife and recreation. .

**Findings:**

Information in the MRP 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:**

The Permittee designed the reclamation plan to restore wildlife habitat by using plant species that will provide good forage and cover.

**Findings:**

Information provided in the MRP 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, -301-412, -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.

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

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 Permittee 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 Permittee 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 shall be eliminated. The Permittee claims that no spoil (excess material) will be generated from the Wild Horse Ridge project.

The Permittee committed to reclaim all highwalls. The premining and postmining contour maps suggest that all highwalls will be eliminated. The cross sections in Appendix 3-O show that all highwalls will be eliminated during final reclamation.

The AOC guidelines suggest 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 that a variance from the AOC requirements be granted. The Permittee 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 MRP is adequate to meet the requirements of this section of the regulations.

## 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:**

**General**

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 Permittee 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 relative to the Wild Horse Ridge project require that all coal seams be backfilled and adequately covered. All coal seams at the Wild Horse Ridge site will be covered and backfilled.

No small depressions or impoundments of any kind will be retained after final reclamation.

**Findings:**

Information provided in the MRP 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 mining and reclamation plan. The plan is adequate for the mine openings at the Wild Horse Ridge. The auxiliary portal associated with the #4 Mine which is located in the left fork of the right fork of Bear Canyon (entries connect the 1st West Bleeder to the surface) will require reclamation from inside the Mine, as there is no machinery access to this portal from the surface. The reclamation procedures are described in APPENDIX 3-Q, #4 Mine Auxiliary Portal. [01/09/2006]

**Findings:**

The amendment meets the requirements of this section of the regulations.

## TOPSOIL AND SUBSOIL

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

**Analysis:**

Chapter 2, Soil Resources, Sec. R645-301-231 and 242 and Chap 5 Sec. 542.200discuss the soil reclamation plan for the proposed Wild Horse Ridge area.

**Redistribution**

Table 2-2 provides an estimated topsoil replacement depth for each of the disturbed soil types. Table 2-7 itemizes the total acres to be recontoured by reclamation area (designated TS-1 through TS-17). Table 2-8 provides a summary of soil redistribution volumes by area. The total volume required is approximately 52,000 $yd^3$ for the 40-acre site. The average topsoil replacement thickness for the Wild Horse Ridge disturbed area should be 18 inches based on the 8700 $yd^3$ of soil salvage (Table 5J-1) from areas TS-12, TS-13, TS-14, and TS-15.

In Sec. 542.200 the Permittee states that coal fines will be removed from disturbed areas if not covered by grading activity and that coal fines will be removed to "pre-mining levels," which the Division understands to mean uncovering native soil. Methods to be used for coal removal include vacuuming (if justified by large quantities), or by washing down with a high-pressure water hose (effective on rock and rocky slopes). Disposal of the waste is described in R645-301-529.

**Soil Nutrients and Amendments**

Section 645-301-231.300, Nutrients and Amendments, states that following final grading, each of the reclamation areas will be sampled with composite samples taken from 0 to 2 ft and from 2 to 4 ft at each sample location. (See Table 2-9) The plan states that additional samples will be taken in the event that the initial sample indicates unsuitable material. In addition to analyzing the samples for micronutrients, analyses will also include standard fertility tests for pH, EC, nitrogen, phosphorus, and potassium. All sampling, testing and result interpretation will be done by a qualified soil scientist. Fertilization and chemical treatments will be applied according to the results of the soil sampling and analysis program.

**Soil Stabilization**

Following backfilling, the regraded 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 screens (talus slopes at the base of cliffs) to allow better soil retention and vegetation establishment.

To minimize compaction of replaced topsoil, travel on reclaimed areas will not be allowed. The Permittee 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 seedbed will be prepared.

**Findings:**

Information provided in the MRP 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 Permittee 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 outslope 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" that 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 MRP 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 scale house 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, describes how the culverts will be reclaimed and disposal of road surface materials.

**Retention**

The Permittee states that 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:**

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

# 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**

The acid and toxic-forming materials sampling plan will continue through the operational period.

**Transfer of wells**

No discussion on transfer of wells in the new permit area is provided. Therefore it is assumed all wells will be properly plugged and 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.

**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. 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 Appendix 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.

**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.

**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 that includes roughening to create 8-12 inch deep pockets. See the section of this analysis discussing 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.

**Impoundments**

See sedimentation ponds.

**Casing and sealing of wells**

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

**Hydrologic Reclamation Plan**

**Findings:**

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

## CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

**Analysis:**

**General**

Contemporaneous reclamation is required as a performance standard. Since this is an underground operation, a schedule for contemporaneous reclamation is not required.

**Findings:**

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

# 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:**

**Revegetation: General Requirements**

The MRP includes a three-phase plan: timetable, revegetation species and seed mix MRP rates, planting methods, mulching techniques, and revegetation success standards.

Table 3-5 provides the "Recommended Seed Mix (Seedlings!), Riparian-Creek Bottom", and Table 3-6 provides the "Recommended Seed Mix, Pinyon-Juniper-Grass". The titles of these tables are misleading and the Permittee will correct during the next technical review. [09152005]. As of 04/03/2007 the titles had not been corrected. The author of this section should contact the permittee to ensure the information is updated.

The Permittee will add canyon sweetvetch to the final seed mix (Table 3-6). The Permittee will collect seed from local populations. The topsoil pile will also provide an additional seed source for this species.

The Permittee will cut willows nearby sources and plant in the riparian sites. The planting method will include planting willows at least every foot. The Permittee may need to return after a few years to plant supplemental willows. The Division recommends replanting in sites where sediment builds up over the years in the riprapped channels.

**Revegetation: Timing**

Table 3-4 provides a revegetation schedule. The Division recommends that the Permittee plant containerized seedlings in the fall and bare-root cuttings in the spring (if the area is accessible and the spring weather is wet).

**Revegetation: Mulching and Other Soil Stabilizing Practices**

The MRP provides information on backfilling and grading, gouging, and seeding as well as methods for reclaiming steep slopes.

The Permittee may hydroseed and apply wood fiber mulch. The Division cautions the Permittee that the application of too much wood fiber at the time of seeding may reduce seed to

soil contact. This reduction may reduce seeding success. The Division recommends hydroseeding with a wood fiber binder (small amount), followed by applying wood fiber mulch.

**Revegetation: Standards For Success**

The Permittee will follow sampling requirements identified in the Division's "Vegetation Information And Monitoring Guidelines" (p. 3-15). The Permittee will conduct yearly qualitative vegetation evaluations as well as conduct quantitative vegetation surveys throughout the 10-year responsibility period. Regulations require quantitative vegetation surveys during years nine and ten (refer to R645-301-357.200). However, the Division recommends additional quantitative surveys, within the 10-year period, in order to provide the necessary data to meet Phase II and III bond release standards.

The Division recommends additional quantitative surveys to those stated in the regulation (refer to R645-301-357.200). The Permittee plans to survey many times during the responsibility phase. The Division, however, provides some recommendations that may help the Permittee achieve Phase II and III bond release. The Permittee may consider rearranging some of the monitoring schedules to include monitoring shrub density at years 4 and 8 following the last augmentation. The 4$^{th}$ and 8$^{th}$ year shrub density surveys are for areas designated as wildlife for the PMLU. The 4$^{th}$ year results do not need to meet the 90% requirement, but the survey is needed to demonstrate that at least 80% of the shrubs and trees have been in place for 60% of the responsibility period (refer to R356.232). The 8$^{th}$ year survey is needed to demonstrate that no shrubs or trees have been in place for less than two growing seasons (refer to R356.232). The Permittee's monitoring schedule does not indicate plans to monitor during these recommended years. This is not considered a deficiency, however, since the regulations do not require including these years as part of a monitoring schedule.

The effectiveness of vegetation for approved postmining land use and extent of cover compared to the extent of cover of the reference area determines revegetation success. Any negative impacts to the reference area may confound statistical comparisons and analysis.

The Permittee commits to meet diversity standards with its approved revegetation plan and successful growth of the species in the final seed mix. The Permittee will provide additional plantings of seedlings to contribute to diversity for the riparian areas.

The Division, in consultation with DWR, established the woody plant density at 1010 woody plants per acre. This density should meet the goal of the PMLU even though the reference area had a higher density at the time of the baseline survey.

The husbandry practices approved by the Division will be applied as needed.

**Findings:**

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

## STABILIZATION OF SURFACE AREAS

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

**Analysis:**

The Permittee plans to gouge the regraded pad area, tank seam, conveyor access road slopes and the Wild Horse Ridge topsoil storage site ASCA to an 8-inch depth on the pad areas (Sec. 542.200 and Appendix 7-K).

The Permittee should investigate the use of deeper gouging, to depths of 18 - 24 inches on the reclaim site. Deep gouging has been used successfully on reclamation sites through out Utah and has been described in The Practical Guide to Reclamation in Utah, page 66. This publication is available on the web at http://www.dogm.nr.utah.gov

Mulching is described in Section R645-301-341 page 3-41 as well as Section 542.200. The Permittee intends to use excelsior blanket on slopes of 2h:1v.

Section 542.200 indicates that rocks will be embedded into the upper surface as described on page 5H-27 (in a May 10, 1994 letter from Dames and Moore). The goal will be to obtain a minimum cover of 32% rock, similar to the reference area. Wind protection through the use of boulders is also described in R645-301-412.110 Method for Achieving Post-Mining Land Use.

**Findings:**

The information provided meets the requirements of the regulations to provide stabilized surface areas.

## 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 mining and reclamation plan.

**Findings:**

The information provided meets the 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 Permittee 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 1-1 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 permit area. Plate 3-2A, Plate 3-2B and Plate 3-2F show the disturbed area boundaries during reclamation.

**Reclamation Backfilling And Grading Maps**

The Permittee gave the Division detailed maps that show how the backfilling and grading requirements will be met. [04012007]

**Reclamation Facilities Maps**

The Permittee gave the Division detailed maps of all reclaimed facilities including the access road.

**Final Surface Configuration Maps**

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

**Findings:**

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

## BONDING AND INSURANCE REQUIREMENTS

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

**Analysis:**

**General**

The surety bond on file for the Division covers Exhibit A, the permit area. The Division determined the amount needed for the Division to reclaim the Bear Canyon Mine in the event of bond forfeiture. That amount is $2,187,000 in 2008 dollars. [whw04012007]

**Determination of Bond Amount**:

*Demolition:*

The Division calculated the demolition and disposal costs as outlined in the OSM Reclamation Cost Handbook and according to standard Division practices. Those procedures are outlined as follows:

- The Division does not allow salvage value in the reclamation cost estimates.
- The Division will allow the cost of steel disposal to be based on the transportation cost to a scrap dealer.
- Because the disposal fees for landfills are site-specific, the Division will base those fees on local landfills provided the costs can be documented. The Permittee has the obligation to provide that information. The Division assumes that all non-steel and non-concrete demolition will be shipped to the Neilson landfill.
- If the approved mining and reclamation plan states that some type of debris can be disposed of on site then the on-site disposal fees must be included. On site disposal fees, should be included to cover the cost of transporting the debris to a disposal site and backfilling and covering the debris.

The Division and the Permittee reviewed and agreed upon the demolition costs. See the bond cost estimate for more details.

*Earthwork:*

- Tank Seam Access Road and Portal Pad: No material will be imported or exported from this site. A total of 20,310 $yd^3$ will be cut and then used as fill. Approximately 9,649 $yd^3$ of material will be cut and filled in one operation with an excavator. The amount of material to be hauled by truck within the site is 10,661 $yd^3$. The Permittee assumed that the material to be hauled will be loaded by an excavator onto a 10 $yd^3$ dump truck. Once the material has been trucked an excavator will place it.

- Upper Storage Pad: The amount of fill needed is 8,083 $yd^3$. Local cuts will produce 6,447 $yd^3$, and the remaining fill will be shipped from the coal storage pad. The cut and fill operation is assumed to be a continuous operation with an excavator. Placing the imported fill will also be done with an excavator. The transportation costs for hauling the fill from the coal storage pad will be calculated in the coal storage pad subsection.

- Portal Pad Area & Road: The amount of fill needed is 7,908 $yd^3$. Local cuts will produce 6,648 $yd^3$, and the remaining fill will be shipped from the coal storage pad. The cut and fill operation is assumed to be a continuous operation with an excavator. Placing the imported fill will also be done with an excavator. The transportation costs for hauling the fill from the coal storage pad will be calculated in the coal storage pad subsection.

- Portal Pad Area: The amount of fill needed is 7,908 $yd^3$. The fill material will come from on site and the coal storage area if needed. The cut and fill operation is assumed to be a continuous operation with an excavator. Placing the imported fill will also be done with an excavator. The transportation costs for hauling the fill from the coal storage pad will be calculated in the coal storage pad subsection.

- Portal Access Road: The amount of fill needed is 9,167 $yd^3$. The fill material will come from on site and the coal storage area if needed. The cut and fill operation is assumed to be a continuous operation with an excavator. Placing the imported fill will also be done with an excavator. The transportation costs for hauling the fill from the coal storage pad will be calculated in the coal storage pad subsection.

- Lower Road to Switchback: The amount of cut and fill material needed is 4,028 $yd^3$. The cut and fill amounts balance, so no material will be imported or exported from the site. The Permittee assumes that all cut and fill operations can be done with an excavator.

- Tipple Access Road: The amount of cut and fill material needed is 1,167 $yd^3$. The cut and fill amounts balance, so no material will be imported or exported from the site. The Permittee assumes that all cut and fill operations can be done with an excavator.

- Coal Storage Pad: The site has 19,453 $yd^3$ of cut material and needs 15,333 $yd^3$ of fill material. The on site cut and fill operation will be done with a bulldozer. The loading and trucking of material will be done with a front-end loader and dump trucks.

- Scale House: The amount of cut and fill material is 711 $yd^3$. The cut and fill amounts balance, so no material will be imported or exported from the site. The Permittee assumes that all cut and fill operations can be done with a bulldozer.

- Sediment Pond A: The amount of cut and fill material is 1,556 $yd^3$. The cut and fill amounts balance, so no material will be imported or exported from the site. The Permittee assumes that all cut and fill operations can be done with a bulldozer.

- Sediment Pond B: The amount of cut and fill material is 1,167 $yd^3$. The cut and fill amounts balance so no material will be imported or exported from the site. The Permittee assumes that all cut and fill operations can be done with a bulldozer.

- Sediment Pond C: The amount of cut and fill material is 324 $yd^3$. The cut and fill amounts balance, so no material will be imported or exported from the site. The Permittee assumes that all cut and fill operations can be done with a bulldozer.

- Shower House: The amount of cut and fill material is 3,426 $yd^3$. The cut and fill amounts balance, so no material will be imported or exported from the site. The Permittee assumes that all cut and fill operations can be done with a bulldozer.

- Wild Horse Ridge Portal Area: The amount of cut and fill material is 10,288 $yd^3$, with and additional 4,860 $yd^3$ of topsoil that will be imported. The Permittee

assumes that all cut and fill work will be done with a bulldozer. The topsoil will be loaded with a front-end loader and haul in dump truck to the site. All topsoil will be spread with a bulldozer.

- Wild Horse Ridge Upper Access Road: The amount of cut and fill material is 1,912 $yd^3$ with 2171 $yd^3$ of topsoil to be imported. The Permittee assumes that the material can be moved with a bulldozer. The topsoil will be loaded with a front-end loader and haul in dump truck to the site. All topsoil will be spread with an excavator.

- Wild Horse Ridge Upper Access Road: The amount of cut and fill material is 2,947 $yd^3$. The Permittee assumes that half the material can be moved with a bulldozer and the other half with an excavator.

The Division and the Permittee reviewed and agreed on the earthwork costs. See the bond calculations for more details.

*Vegetation Costs:*

The vegetation costs were based on the following:

- The approved mining and reclamation plan and the proposed addition of the Wild Horse Ridge area. In addition a Division biologist reviewed the reclamation cost estimate.

- The revegetation rate would be 25%.

- Seeds and seedlings costs were based upon costs for purchasing them from a local dealer. Since these costs can fluctuate on an annual basis the Division will continually review the costs and make adjustments as needed.

*Indirect Costs:*

The indirect costs that the Division calculates are as follows:

- Startup Costs: The startup costs include mobilization/demobilization, permits, insurance and bonds. **The Division assumes that the startup costs for a reclamation project are 10% of the direct costs**. The 10% amount is based on a flat rate stated on Page 23 of the OSM's *Handbook for Calculation of Reclamation Bond Amount Revised April 2000.* The OSM handbook did not include a reference for the 10%. That amount is verified by AML costs.

- Contingency: The contingency amount is listed in the section entitled "How to Use the Book: The Details" in the R. S. Means Company, Inc. publications. The contingency range is 5% to 10%. **Therefore, the Division will use the low range of 5%.** [04012007]

**Note: The contingency fee is for items that will be encountered but have not yet been identified in the permit MRP, Mining and Reclamation Plan, proposed amendments or significant revisions.**

- Engineering Redesign Fee: The engineering redesign fee is a line item in the R. S. Means Company, Inc. minimum. **The minimum engineering redesign fee for the year 2000 is 2.5%.** [04012007]

- Main Office Expense: The cost for the main office expense is shown as line items in the R. S. Means Company, Inc. publications. Main office expense cover costs that are not directly incurred for a specific project but are needed by the contractor to operate. Examples of main office expense include, but are not limited to, administrative costs, building rental, equipment storage areas, and certain types of insurance and taxes. The indirect costs are 8% up to $1,000,000, **6.8% up to $4,000,000,** 5.6% up to $7,000,000 and 5.10% up to $10,000,000 and 3.9% for more than $10,000,000. [04012007]

- Project Management Fee: The project management fee is the line item identified in the R. S. Means Company, Inc. The costs are 4.5% for direct costs up to $1,000,000 and **2.5% for direct costs of up to $5,000,000.** [04012007]

*Inflation:*

The Division uses the three-year average for the escalation factor from the Means Historical Cost Index for Utah. The Division will escalate the demolition and earthwork costs to the end of the permit term (maximum of 5 years).

**Terms and Conditions for Liability Insurance**

Liability insurance information is located in App. 1-C.

**Findings:**

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

# CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

**Analysis:**

The Wildhorse Ridge modification and Bear Canyon Lease Expansion Project are located within the current Gentry Mountain CHIA. The CHIA was updated in March 2007 to include the addition to the permit of approximately 2,740 acres of fee coal and federal coal leases U-46484, U-61048, and U-61049 and the remaining 80 acres of U-024316. [02262007]

**Findings:**

The current CHIA is sufficient to meet the requirements of the R645 Rules. [02262007]

# APPENDICES

## SUMMARY OF COMMITMENTS

The summary below presents a list of commitments stated within the mining and reclamation plan (MRP). This list provides the following information for each commitment, when applicable:

- Title.
- Objective.
- Frequency.
- Status.
- Reports.
- Citation.

BEGIN COMMITMENT LIST BELOW

***There are stipulations that are included as Attachment A to the permit. The stipulations require the permittee to monitor subsidence annually throughout the life of the mine and survey those areas that have subsided that were not included in previous class three surveys.***

***"C.W. Mining Company must amend the air quality approval order to allow for the increase in throughput to 2.5 MTPY. This document must be in place before the Permittee exceeds the approved 1.95 MTPY"***

***Chapter three page 3-68 of the MRP includes a commitment to develop a raptor mitigation plan by July 1, 2007 in consultation with the DWR, DOGM, U. S. F. W. S., U. S. F. S. and BLM to mitigate impacts to nests and or raptors from potential escarpment failure caused by subsidence.***

## APPENDIX C
## FS AND BLM COAL LEASE STIPULATIONS

1. The Regulatory Authority shall mean the State Regulatory Authority pursuant to a cooperative agreement approved under 30 CFR Part 745 or in the absence of a cooperative agreement, Office of Surface Mining. The authorized officer shall mean the State Director, Bureau of Land Management. The authorized officer of the Surface Management Agency shall mean the Forest Supervisor, Forest Service. Surface Management Agency for private surface is the Bureau of Land Management. For adjoining private lands with Federal minerals and which primarily involve

National Forest Service issues, the Forest Service will have the lead for environmental analysis and, when necessary, documentation in an environmental assessment or environmental impact statement.

2. The authorized officers, of the Bureau of Land Management, Office of Surface Mining (Regulatory Authority), and the Surface Management Agency (Forest Service) respectively, shall coordinate, as practical, regulation of mining operations and associated activities on the lease area.

3. In accordance with Sec. 523(b) of the "Surface Mining Control and Reclamation Act of 1977," surface mining and reclamation operations conducted on this lease are to conform with the requirements of this Act and are subject to compliance with the Office of Surface Mining Regulations, or as applicable, a Utah program equivalent approved under cooperative agreement in accordance with Sec. 523(c). The United States Government does not warrant that the entire tract will be susceptible to mining.

4. Federal Regulations 43 CFR 3400 pertaining to Coal Management make provisions for the Surface Management Agency, the surface of which is under the jurisdiction of any Federal agency other than the Department of Interior, to consent to leasing and to prescribe conditions to insure the use and protection of the lands. All or part of this lease contain lands the surface of which are managed by the United States Department of Agriculture, Forest Service Manti-La Sal National Forest.

The following stipulations pertain to the lessee responsibility for mining operations on the lease area and on adjacent areas as may be specifically designated on the National Forest System lands.

5. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory and a paleontological appraisal of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists or qualified paleontologists, as appropriate, and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified cultural or paleontological resources.

If cultural resources or paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the lessee prior to disturbance shall, immediately bring them to the attention of the appropriate authorities. Paleontological remains of significant scientific interest do not include leaves, ferns, or dinosaur tracks commonly encountered during underground mining operations.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the lessee.

6. If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory bird species of high Federal interest occur in the area the lessee shall be required to

conduct an intensive field inventory of the area to be disturbed and/or impacted. The inventory shall be conducted by a qualified specialist and a report of findings will be prepared. A plan will be prepared making recommendations for the protection of these species or action necessary to mitigate the disturbance.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the lessee.

7. The lessee shall be required to perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. Existing data may be used if such data is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

8. Powerlines used in conjunction with the mining of coal from this lease shall be constructed so as to provide adequate protection for raptors and other large birds. When feasible, powerlines will be located at least 100 yards from public roads.

9. The limited area available for mine facilities at the coal outcrop, steep topography, adverse winter weather, and physical limitations on the size and design of the access road, are factors, which will determine the ultimate size of the surface area utilized for the mine. A site specific environmental analysis will be prepared for each new mine site development and for major modifications to existing developments to examine alternatives and mitigate conflicts.

10. Consideration will be given to site selection to reduce adverse visual impacts. Where alternative sites are available, and each alternative is technically feasible, the alternative involving the least damage to the scenery and other resources shall be selected. Permanent structures and facilities will be designed, and screening techniques employed, to reduce visual impacts, and where possible achieve a final landscape compatible with the natural surroundings. The creation of unusual, objectionable, or unnatural land forms and vegetative landscape features will be avoided.

11. The lessee shall be required to establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data.

12. The lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal handling and storage facilities. On Forest Development Roads (FDR), lessees may perform

their share of road maintenance by a commensurate share agreement if a significant degree of traffic is generated that is not related to their activities.

13. Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to existing surface structures, or (3) damage or alter the flow of perennial streams. The lessee shall provide specific measures for the protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created.

14. In order to avoid surface disturbance on steep canyon slopes and to preclude the need for surface access, all surface breakouts for ventilation tunnels shall be constructed from inside the mine, except at specifically approved locations.

15. If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with the regulations of the surface management agency.

16. The coal contained within, and authorized for mining under this lease, shall be extracted only by underground mining methods.

17. Existing Forest Service owned or permitted surface improvements will need to be protected, restored, or replaced to provide for the continuance of current land uses.

18. In order to protect big game wintering areas, elk calving and deer fawning areas, sagegrouse strutting areas, and other critical wildlife habitat and/or activities, specific surface uses outside the mine development area may be curtailed during specific periods of the year.

19. Support facilities, structures, equipment, and similar developments will be removed from the lease area within 2 years after the final termination of use of such facilities. This provision shall apply unless the requirement of Section 10 of the lease form is applicable. Disturbed areas and those areas previously occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to a pre-mining land use.

20. The lessee at the conclusion of the mining operations, or at other times as surface disturbance related to mining may occur, will replace all damaged, disturbed, or displaced corner monuments (section corners, quarter corners, etc.) their accessories and appendages (witness trees, bearing trees, etc.) or restore them to their original condition and location, or at other locations that meet the requirements of the rectangular surveying system. This work shall be conducted at the expense of the lessee, by a professional land surveyor registered in the State of Utah and to the standards and guidelines found in the manual of surveying instruction, U.S. Department of Interior.

21. The lessee at his expense will be responsible to replace any surface water identified for protection, that may be lost or adversely affected by mining operations, with water from an alternate source in sufficient quantity and quality to maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses.

22. The lessee must comply with all the rules and regulations of the Secretary of Agriculture set forth at Title 36, Chapter II, of the Code of Federal Regulations governing the use and management of the National Forest System (NFS) when not inconsistent with the rights granted by the Secretary of the Interior in the lease. The Secretary of Agriculture's rules and regulations must be complied with for (1) all use and occupancy of the NFS prior to approval of a permit/operation plan by the Secretary of Interior, (2) uses of all existing improvements, such as Forest Development Roads, within and outside the area licensed, permitted or leased by the Secretary of Interior, and (3) use and occupancy of the NFS not authorized by a permit/operation plan approved by the Secretary of the Interior.

All matters related to this stipulation are to be addressed to:

Forest Supervisor
Manti-La Sal National Forest
599 West Price River Drive
Price, Utah 84501
Telephone No.: (435) 637-2817

who is the authorized representative of the Secretary of Agriculture.