

# M&RP TEXT PAGES

## **REDLINE AND STRIKEOUT FORMAT**

(These pages are for review only)

**DO NOT INSERT  
THESE TEXT PAGES  
IN M&RP**

- |    |                                    |  |
|----|------------------------------------|--|
| 1. | First coal produced                | 1941   |
| 2. | Termination of mining activity     | December, 2016                               |
| 3. | Horizontal extent of mine workings | 24,579.92 acres<br>(Life of mine)            |
| 4. | Vertical extent of mine workings   | Surface to 2,000 feet deep<br>(Life of mine) |

The anticipated total acreage to be affected during the five years of operation by underground mining activities is 1,500 acres. The estimated number of total surface acres to be affected over the entire mining operation is ~~46.233~~46.156 acres.

	PERMITTED DISTURBED AREA <u>BOUNDARY</u>	ACTUAL AREA CURRENTLY DISTURBED <u>TO BE RECLAIMED</u>	<u>SITE DESCRIPTION</u>
	28.084	16.758	Mine Site, East Spring Canyon
	0.286	0.017	3 East Portals
	1.774	0.70	4 East Portals
	0.302	0.017	South Portals
	0.396	0.017	Quitcupah Portals
	<del>0.077</del>	<del>0.017</del>	<del>Muddy Canyon Portal</del>
	0.967	0.39	Spring Collection Field, Convulsion Canyon
	0.220	0.075	Pump House, Convulsion Canyon
	0.784	0.40	Leach Field, Convulsion Canyon
	1.595	0.193	Water Tank, East Spring Canyon
	0.287	0.18	Substation, Link Canyon No. 1
	0.245	0.12	Substation, Link Canyon No. 2
	0.230	0.14	Link Canyon Portal
	<u>10.986</u>	<u>8.733</u>	<u>Waste Rock Disposal Site</u>
	<del>46.233</del> 46.156	<del>27.757</del> 27.740	Totals

The permit area, which is the same as the lease area legal descriptions in Section 114, includes 23,939.92 acres of Federal coal leases, 640 acres of fee coal leases, the 40 acres waste rock disposal site and 13.03 acres under U.S. Forest Service special use permit for a total of 24,632.95 acres.

**117 Insurance and Proof of Publication**

Certificates of Insurance issued to Canyon Fuel Company, LLC are located in Appendix 8-1.

A copy of an updated Certificate of Liability Insurance is attached as Appendix 117-A.

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## ***2.20 Environmental Description***

The SUFACO Mine area lies in central Utah at the southern end of the Wasatch Plateau. Topography is dominated by plateaus separated by deeply incised canyons. Canyon walls are generally composed of laterally continuous (several thousand feet) ledge-forming sandstones, interbedded with slope forming shales and siltstones. Topography in the SUFACO Mine area ranges from 6500 to about 9,000 feet above sea level. Soils are generally not cultivated due to their thin nature, shortage of irrigation water, and a short growing season. Residual and colluvial soils are present at the SUFACO Mine surface facilities area. These soils have formed from residual sandstone and shale particles that mixed as they migrated down slope. Soils are usually very shallow, consisting predominantly of sand and silty sand loams which have high percolation rates. The soils are highly susceptible to wind erosion. The inherent erosion hazard from water is low. Rock outcrops consist of alternating layers of sandstone and shale. Subordinate amounts of coal and limestone are also present. The landscape is steep and rocky with massive sandstone ledges, and siltstone/shale slopes. Surface and subsurface layers are often rocky.

### ***2.2.1 Prime Farmland Investigation***

No prime farmland exists in the SUFACO Mine disturbed area, Link Canyon disturbed area, or in any of its lease areas. Mining activities will not impact prime farmland. In compliance with R645-302-313, a pre-application investigation was conducted by the Applicant to determine if any prime farmland would be impacted by the project. Based on the criteria in 30 CFR 783.27 paragraph (b), the Convulsion Canyon area, Link Canyon, and the Pines Tract area cannot be classified as prime farmland. Consultation with Dr. Theron B. Hutchings, State Soil Scientist for the Soil Conservation Service, substantiated the absence of prime farmland in the Convulsion Canyon and Link Canyon areas. (Appendix 2-1).

### ***2.2.2 Soil Survey***

A Level I soil survey of the entire SUFACO Mine disturbed area, including the Link Canyon Substations No. 1 and 2 ~~and Muddy Canyon disturbance areas~~, has been conducted. Soil survey data are presented in Appendix 2-2 for the majority of the permit area, Appendix 2-6

for the Link Canyon Substation areas, ~~Appendix 2-7 for the Muddy Canyon Breakout~~, and are herein summarized in Sections 2.2.2.1 through 2.2.2.3. Survey data includes the following information: taxonomic classification, horizon name and depth, dry and moist color, texture (percent sand, silt, and clay), class, structure, percent rock fragments and organic matter, pH, effervescence, EC, and solubility of calcium, magnesium, and sodium (Appendices 2-2, and 2-6 and ~~2-7~~). A cross-reference list of map unit, soil taxonomic classification, and sample site appears in pages 17 through 19 of Appendix 2-2.

An Order 2 soil survey has been completed for the Link Canyon Substation No. 1 disturbed area and is included in Appendix 2-2. Additionally, an Order 1 soil survey was conducted of the substation Nos. 1 and 2 pad areas and the results are included in Appendix 2-6.

An Order 3 soil survey has been conducted for the Pines Tract and the results are included in Appendix 2-8. (Plate 2-2)

#### ***2.2.2.1 Soils Map***

Plates 2-1 and 2-2 delineates the soil types present in the disturbed and adjacent areas.

#### ***2.2.2.2 Soil Identification***

Soils present in the narrow V-shaped East Spring Canyon, which lie within and immediately adjacent to the disturbed area of the SUFCO Mine have been identified, characterized, and their spatial occurrences documented (Appendix 2-2). Four soil types are present in the disturbed area, and are herein referred to as soil types O, W, T, and X (Plate 2-1). Soil type O is a loamy-skeletal, mixed, frigid Ustic Torriorthent. Soil W is a loamy-skeletal, mixed, frigid Typic Xerothent. Soil type T is a loamy-skeletal, mixed, frigid, Calcixerollic Xerochrept. Soil X is a complex composed of both a clayey-skeletal, mixed, frigid, shallow Lithic Calcixeroll, and a fine, mixed, frigid Mollic Haploxeralf.

~~Muddy Canyon Breakout and Pines Tract~~

~~A description of the soils within the disturbed area of the Muddy Canyon Breakout and The general description of the soils within the Pines Tract is provided in Appendix 2-7 and Appendix 2-8, respectively. Field notes and laboratory data for samples obtained from the breakout are also included in Appendix 2-7.~~

**2.2.2.4 Soil Productivity**

In areas where soil disturbance has resulted from mining activities, the soils have lost their native identities. In most cases the soils have been quite thoroughly mixed. As a result, soil textures and horizons have been altered. Textures are now primarily loams and silty clay loams; depths over indurated material or shale are generally greater than 30 inches, except along "cut" slopes of the mountain where geologic strata are exposed.

As a result of this disturbance in "fill" areas, the potential for reclamation has been enhanced. The soils are deeper and the resulting textures are more desirable for plant growth.

Saturation percentages are unavailable. When the original sampling and analyses of soils for the portal yard area were completed, saturation percentage was not required by the regulatory agencies.

Electrical conductivity and other analytical data for soils of the disturbed area, soil types O, W, T, and X, are found in Tables 51, 56, 53, 57, and 58, of Appendix 2-2, respectively. These data reveal a high percentage of rock fragments which may limit fertility for both topsoil and subsoil. Vegetation associated with these soils regarding soil productivity are presented (as recommended by the Soil Conservation Service) in Appendix 2-2 and discussed in Chapter 3 of the Mining Reclamation Plan (MR&P).

**2.2.3 Prime Farmland Soil Characterization**

No prime farmland exists in the permit area (see Section 2.2.1).

## **2.30 Operation Plan**

### **2.3.1 General Requirements**

#### **2.3.1.1 Removing and Storing Soil Methods**

The SUFCO Mine has been in operation since 1941. At the time the main facilities in East Spring Canyon were constructed, no topsoil was segregated and saved. Topsoil and other fill material was used in construction of the surface facilities pad. However, soils removed from the Link Canyon Substation No. 1 area are to be stored in the outslope of the substation pad. Additionally, the soils removed from the Link Canyon Substation No.2 area will be stored in a small stockpile adjacent to the substation pad. ~~Soils will be salvaged at the Muddy Canyon Breakout and stored within the mine a short distance from the opening. No effort will be made to separate the topsoil from the subsoil at the Muddy Canyon Breakout.~~ The mix of topsoil and subsoil will be used as substitute topsoil at the time of reclamation. Soils removed from the Link Canyon Mine Portal area will be stored in a topsoil pile located south of the disturbed portal pad area out of the floodplain (Plate 5-2F). The majority of the portal area has been previously disturbed and only thin topsoil layers exist in portions of the disturbed area. Topsoil will be carefully removed with efforts made to minimize the amount of subsoil salvaged since most of the subsoils are not suitable as substitute topsoil or growth media.

The methods described herein are followed when removing and storing soil resources that necessitate removal as a result of construction of new surface operations.

Soil salvage will take place in two lifts where possible. The first lift will include the A horizon material to be stockpiled in one location and the second lift will include the remaining B and C horizons, excluding material with a coarse fragment content of over 50 percent. The latter would be stockpiled in a third, but adjacent location. These stockpiles will be graded to gradual slopes (3h:1v) and seeded to promote surface stabilization.

maintained in the soils to reduce dust and loss of the resource. Maintaining soil moisture may be accomplished using a water truck equipped with pumps and hoses and personnel assigned to spraying the dry soils prior to and during salvage operations. In areas where Creeping Oregon Grape is present, the soils will be removed and temporarily stored separately until the topsoil pile is constructed. At that time, the soils containing the grape will be placed as the top layer of soil, thus encouraging the establishment of oregon grape.

~~Soils in the area of the Muddy Canyon Breakout will be salvaged as the breakout is constructed from within the mine. It is anticipated the breakout disturbance will result in an opening of 20 feet by 20 feet. As mining equipment daylights at the breakout, the soil caving into the mine from the surface will be separated from the coal and salvaged. Mining equipment with "bucket loading" capabilities will be used to salvage the soils and separate coal from the soil. Where possible, the upper 20-inches of the soil will be salvaged and stored. Topsoil and subsoil from this area will not be salvaged or stored separately. Assuming that all of the soil from the breakout is recovered, approximately 25 CY of soil will be recovered (Assume a breakout with a surface area of: 20 ft X 20 ft = 400 sqft X 1.7 ft (20 in) = 680 cuft ÷ 27 cuft/CY = 25 CY). If additional soil is available, it will also be salvaged. Salvaged soil will be stored within the mine, possibly within a cross-cut, a short distance from the breakout. The soil will be stored uncompacted in a pile constructed to a height of less than five feet in an area protected from wind and water erosion. A berm will be constructed around the base of the pile to protect the pile from mining activities that may occur in the area. A sign indicating the soil is a topsoil storage pile will be placed in a visible location on the storage pile. Since the ventilation system within the mine is an exhausting system (air from within the mine is drawn out with the aid of fans) and the planned breakout is for air intake, few air born contaminants (i.e. coal fines) will contact the soil pile.~~

The sewer leach field for the mine site buildings will be expanded and two new water holding tanks will be buried in place at the existing pump house in the Fall of 2001. In both cases, the soils at these two locations have been disturbed in the past. A field investigation conducted

Topsoil from the Link Canyon Substation No. 1 will be placed and stored on the outslope of the pad. This storage area will be protected with berms and/or silt fences, a three-strand barbwire fence, and revegetated to control erosion. This soil will not be moved or disturbed until it is required for redistribution during final reclamation.

Soil from the Link Canyon Substation No. 2 will be placed in a soil stock pile located at the south end of the pad area. The storage area will be protected with berms and/or silt fences, a three strand barbwire fence, and revegetated to control erosion. This soil will not be moved or disturbed until it is required for redistribution during final reclamation.

Soil from the Link Canyon Mine Portal area will be placed in a topsoil pile located south of the disturbed portal pad area out of the floodplain (Plate 5-2F). The storage area will be protected by installing a topsoil storage sign at the base of the pile, berms and/or silt fences, a three strand barbwire fence, and protected from wind and water erosion by surface pitting the stockpile to retain moisture and reduce erosion and by being revegetated with a quick growing vegetative cover (standard seed mix in section 3.4.1.2 minus the shrubs and trees) to control erosion. This soil will not be moved or disturbed until it is required for redistribution during final reclamation. The surface of the topsoil pile will be pitted to reduce runoff and erosion. Cuttings of Creeping Oregon Grape salvaged from the area during initial site construction will be buried in the top few inches of the pile. Establishment of this plant should reduce erosion of the pile. Additionally, vegetation removed during site construction, such as sage brush and other woody plants, will be placed on top of the pile.

~~Soils from the Muddy Canyon Breakout will be stored within the mine as described in Section 2.3.1.1.~~

Excess subsoil associated with construction of a run of mine coal stockpile is stored at SUFCO Mine's 40-acre waste rock disposal site (see Section 3.1.6 of Volume 3 of this M&RP). This material is segregated and will be available for fill during the reclamation phase of the mine site if needed. About 1,100 cubic yards of topsoil are stored immediately west of the subsoil pile.

#### ***2.3.2.4 Minor Disturbances Not Requiring Topsoil Removal***

***Small Structures.*** Topsoil will not be removed prior to construction resulting in only minor disturbances as described in R645-301-232.400. Such construction activity includes work on small structures such as power poles, signs, fence lines, and other small structures which do not significantly disturb the site.

***Vegetation.*** SUFCO Mine will not remove topsoil for minor disturbances where such activity will not destroy vegetation or cause erosion.

#### ***2.3.2.5 Subsoil Segregation***

Due to the poor quality of the subsoil, the B and C soil horizons will not be individually segregated and stockpiled. The topsoil will be segregated and stockpiled separately from the subsoil (B & C horizons) except in the area of the Link Canyon Substations Nos. 1 and 2, and Link Canyon Mine Portal, ~~and Muddy Canyon Breakout~~. These soils will be salvaged as specified in Section 2.3.2.1

#### ***2.3.2.6 Timing***

Where possible, soil removal will take place after all vegetation has been removed that could interfere with soil salvage. Surface disturbance activities will take place after the soil has been removed.

#### ***2.3.2.7 Topsoil and Subsoil Removal Under Adverse Conditions***

In areas of surface disturbance, topsoil and subsoil will be each removed separately and segregated, except where natural conditions render operations hazardous.

***Conventional Machines.*** In localities where steep grades, adverse terrains, severe rockiness, limited depth of soils, or other adverse conditions exist that render soil removal and segregation activities using conventional machines hazardous, soils will not be salvaged and stockpiled.

Substation No. 2 will be stored in the soil stockpile as shown on Plate 5-2E. Topsoil removed from the Link Canyon Mine Portal area will be stored in the soil stockpile as shown on Plate 5-2F. ~~Soil removed from the Muddy Canyon Breakout will be stored within the mine as described in Section 2.3.1.1.~~

***Protection from Contaminants and Compaction.*** Stockpiled topsoil shall be protected from contaminants and unnecessary compaction. To protect the topsoil from contaminants and unnecessary compaction that could interfere with vegetation, the sediment pond topsoil and the substation stockpiles are isolated with no means of access from the main surface area (Section 2.3.1.4). A topsoil storage sign was installed at the base of both stockpiles and will be placed on the Link Canyon Substations Nos. 1 and 2 and Link Canyon Mine Portal storage areas. ~~A topsoil storage sign will be placed on the Muddy Canyon Breakout soil pile.~~

***Wind and Water Erosion Protection.*** All topsoil stockpiles will be protected from wind and water erosion by prompt establishment and maintenance of a vegetative cover (standard seed mix in section 3.4.1.2 minus the shrubs and trees). The sediment pond and substation topsoil stockpiles are protected from wind and water erosion by the establishment of a protective vegetative cover. The Link Canyon Portal topsoil pile will be protected by establishment of Creeping Oregon Grape and by adding vegetative material removed during site construction. Grasses native to the area will be planted either through seeding or by obtaining and planting plugs from nearby undisturbed sites. A silt fence was installed below the stockpiles to help trap sediment runoff from the stockpiles.

***Topsoil Redistribution.*** All stockpiled topsoil will not be moved until redistributed during reclamation operations unless approved by the UDOGM.

#### ***2.3.4.3 Topsoil Stockpile Relocation***

Stockpiled topsoil in jeopardy of being detrimentally affected in terms of its quantity and quality by mine operations may be temporarily redistributed after approval from the UDOGM.

## **2.40 Reclamation Plan**

### **2.4.1 General Requirements**

Topsoil redistribution, amendments, and stabilization are discussed in Sections 2.4.2, 2.4.3, and 2.4.4, respectively.

### **2.4.2 Soil Redistribution**

#### **2.4.2.1 Soil Redistribution Practices**

In addition to the redistribution practices discussed herein, the following action will be taken. Within the disturbed areas the contaminated surface soil layer will be removed and stored during the final reclamation process. The contaminating gravels, crushed stone, and other contaminants will be buried along with the structure foundations.

**Soil Thickness.** Topsoil will be distributed on all areas with slopes less than 1h:l.5v that are to be reclaimed. Topsoil redistribution procedures will ensure an approximate uniform thickness of six inches. During this time period, the topsoil will be allowed to settle and attain equilibrium with its natural environment. This procedure will be followed for all areas in which facilities such as road beds, mine pads, and building sites are to be abandoned.

**Compaction.** To prevent compaction of topsoil, soil moving equipment will refrain from unnecessary operation over spread topsoil. Front-end-loaders and other wheel mounted equipment may be used to transport and dump topsoil. However, to minimize compaction, only track-mounted equipment (example bulldozer) will be used to spread the topsoil. The topsoil will be disced or ripped, surface roughened, pitted, and/or deep gouged prior to seeding to help alleviate soil compaction, increase soil stability, and to increase water harvesting.

~~At the Muddy Canyon Breakout, soil will be spread over the disturbed area as the portal backfill is placed. The soils stored in the stockpile within the mine will be brought to the surface prior to portal sealing activities and temporarily stored within the disturbed area.~~

~~During construction of the breakout, topsoil and subsoil will not be segregated. Therefore, the salvaged soils will be distributed as substitute topsoil during reclamation activities. As backfill is placed from within the mine to seal the portal, the soil will be placed on the face of the backfill. This will be accomplished using mining equipment, when feasible, and hand labor (shovels) when mining equipment can no longer be used. The surface of the soil will be roughened and deep gouged by hand using rakes and/or shovels. This work will be performed in accordance with Sections 5.4.2.2, 5.4.2.7, and 5.50 of this M&RP. The soil will be revegetated in accordance with the methods described in Section 3.4.1 and Appendix 3-9.~~

In the 300,000 gallon fire water tank area, the concrete foundation of the water tank will be broken up and placed against the base of the cutslope. The fill material used to create the foundation pad will be used first to backfill the tank area. The remainder of the fill necessary for reclamation will be obtained from the subsoil stock pile at the waste rock site. Finally, the topsoils will be returned to the site for distribution. The thickness of the redistributed topsoil should roughly equal six inches, the thickness originally removed.

**Erosion.** Procedures will be exercised to ensure the stability of topsoil on graded slopes to guard against erosion during and after topsoil application. Erosion control measures will include surface roughing, pitting, deep gouging, and/or placement of organic matting on slope areas thought to be unstable.

#### **2.4.2.2 Regrading**

Since the mine is over 55 years old, there are no private or public topographic maps which can be used to accurately determine the original geometric configuration of the canyon. Prior to topsoil redistribution, the disturbed area will be regraded to agree with final reclamation topography (Chapter 5 and Plate 5-3).

The postmining topography was designed by Sergent, Hauskins & Beckwith's (SH&B) (Appendix 2-4). The cut and fill quantities are 74,734 and 71,173 yards, respectively (Appendix 2-5). These values supersede those presented in Appendix 2-4.

Management Unit is located adjacent to the MMA Management Unit. Although this direction does not apply to the adjacent MMA Management Unit where the current proposal is located, the Manti-La Sal National Forest Record of Decision considered this management direction. Direction for operations in adjacent GWR Management Units calls for minimizing potential conflicts. The current proposal will have negligible effects to wintering big game because there will be very little activity at the site following the initial short-term construction activity (pages 14-15, Manti-La Sal National Forest, SUFCO Mine Link Canyon Portal Record of Decision, Oct. 10, 2002). The area will be surveyed for raptor nests. If any are found within the prescribed buffer zone, they will be monitored for activity and work at the portal site will occur following the same guidelines as those described for the Link Canyon Substation.

~~A falcon scrap was noted in the 1998 raptor survey approximately 3/4 mile north of the planned Muddy Canyon Breakout (outside the area of planned subsidence). If the scrap is still active at the time of construction, work at the breakout site will occur following the same guidelines as those described for the Link Canyon Substation in the preceding paragraph.~~

The applicant has implemented a program to monitor the effect of subsidence on the vegetative communities. The applicant uses color infrared photography (CIR) to document changes to vegetation. This CIR coverage was begun in 1987 and will be updated at least every 5 years.

The riparian vegetation within upper Box Canyon adjacent to the 150 acre lease modification is of special concern to the permitting agencies and the permittee. Because of this concern, SUFCO commits to monitoring the effects of subsidence on the riparian vegetation within the upper Box Canyon by including this area within the color infrared photography monitoring program described in the preceding paragraph. Previous infrared surveys have included most of the 150 acre lease modification area and upper Box Canyon. These previous surveys will be used to provide baseline data for the monitoring of subsidence effects, if they occur, on the riparian vegetation within the area. This data will be reviewed by qualified personnel to make determinations concerning the effects of subsidence on the riparian vegetation.

producer. Christmas tree cutting, however, is higher in this community type than others in the area.

The ponderosa pine type is the only vegetation community receiving substantial use for timber production. This type generally occurs on flatter sandy sites and is readily accessible. Large, mature (250 + years) trees have been harvested on a selective basis. Pine regeneration in cut over stands is sparse and mountain mahogany and manzanita appear to be increasing in the understory. Within the SUFCO Mine Quitchupah lease area approximately 528 thousand board feet (MBF) have been harvested between 1977 and 1978 with average volumes of 1.3 average net volume/acre (M. Stubbs personal correspondence, 1979). Quaking aspen stands receive limited local pressure for posts and poles.

The vegetation communities supported in the Pines Tract area and ~~Muddy Canyon Breakout~~ are discussed in Chapter 3 of this M&RP.

**Land Use Description.** The leased areas lie within the Manti-La Sal and Fishlake National Forests and are subject to the Land and Resource Management plans prepared by the agency. These plans identify the principle use of the lease areas as rangeland with small areas set aside for timber harvesting and as general big game range. Recreation in the lease areas includes camping, firewood gathering, hunting, some snowmobiling, and sight seeing from late spring to late fall. Yearly recreation use is light, but during deer and elk hunts, use is extremely heavy.

There are no developed or inventoried recreation campgrounds on the lease areas. The mining operation will not impact any of these uses and will preserve the uses into the postmining period.

The timber on the lease areas are open grown Ponderosa pine. All commercial stands occur on the benches. Trees are of low quality because of the poor tree growing site. Cutting is limited to older over-matured trees and occurs infrequently. No adverse timber impacts are anticipated.

using full-support methods) to Monitor Schedule B (Sites in areas which will be mined under and subsided) requiring the implementation of additional monitoring of the site. Monitoring results will be provided in DOGM Annual Reports. (2003, 2004, 2005, 2006, and indefinitely until movement ceases)

~~A proposed mine breakout located on the south wall of Muddy Canyon was inventoried and evaluated by Dr. Hauck and staff in June of 1999(AERC). No artifacts or paleontological loci were observed or identified during the Muddy Canyon Breakout evaluation. The study concluded that no currently recorded significant or National Register eligible cultural resources will be affected by the development of the breakout (Appendix 4-2, AERC 1999).~~

~~During construction of the Muddy Canyon Breakout project, additional dust will be generated for a limited time. Once the breakout is completed and the vegetation on the small area of disturbance is reestablished, the dust source will be eliminated.~~

#### ***4.2.3 Monitoring Program***

The UDOGM does not require an air monitoring program for the SUFCA underground mine at this time. The mine currently operates under Division of Air Quality approval orders BAQE-126-88 Waste Rock Disposal Site dated April 1, 1988 and DAQE-714-98 SUFCA Mine site dated October 28, 1998 found in Appendix 4-4.

is only temporarily stored at the mine prior to off-site disposal, there is no significant potential for this debris to spontaneously combust. Fire extinguishers are kept on mobile equipment in the mine yard to extinguish any fires should combustion of the waste materials occur. Waste materials that constitute a fire hazard (e.g., grease, lubricants, paints, and flammable liquids) will be stored in such a manner as to minimize any fire hazard. Empty containers of such products will only be stored temporarily at the mine-site prior to proper off site disposal.

#### **5.2.8.4 Dams, Embankments, and Impoundments**

No dams, embankments, or impoundments are used for the handling or disposal of coal, overburden, excess spoil, or coal mine waste in the permit area.

#### **5.2.9 Management of Mine Openings**

~~Thirteen~~Ten underground mine openings exist within the permit area. Locations of these portals are shown on Plates 5-2A,C,&F. Three of these openings are located at the mine surface facilities in East Spring Canyon and serve as primary pathways for ingress and egress of personnel and machinery, removal of coal from the mine, and mine ventilation. The remaining ~~tenseven~~ openings are located as follows:

~~South portals - 2 intakes~~

3 East portals - 2 intakes

Quitcupah portals - 2 intakes

4 East portals - 1 intake and 1 fan portal

~~Proposed Muddy Canyon Portal - 1 intake~~

Link Canyon Portal - 1 intake

These remaining (non-East Spring Canyon) openings are used for mine ventilation and emergency egress. Each of these supplementary intakes is protected from unauthorized entry by the installation of steel sets and a locked chain-link gate. The keys for the gates are kept approximately 25 feet from the gates inside the mine. This permits emergency exit from the mine but prevents entrance from the outside.

## **5.50 Reclamation Design Criteria and Plans**

### **5.5.1 Casing and Sealing of Underground Openings**

Each underground opening to the mine will be sealed and backfilled when no longer needed for monitoring or other use approved by the UDOGM upon a finding of no adverse environmental or health and safety effects. Permanent closure measures will be as described in Section 5.4.2.7. This closure method has been designed to prevent access to the mine workings by people, livestock, fish and wildlife, and machinery. The closures have also been designed to keep water from flowing from the mine workings to prevent acid or other toxic drainage from entering ground and surface waters. ~~The Muddy Canyon Portal seal could be subjected to a maximum hydrostatic pressure of 69 psi if the mine were to completely fill up with water to the highest elevation point in the mine. This hydrostatic pressure will be designed into the seal design when constructed.~~

### **5.5.2 Permanent Features**

#### **5.5.2.1 Small Depressions**

During final grading and spreading of topsoil, small depressions will be left in the soil. The purpose of these depressions will be to retain moisture, minimize erosion, and assist revegetation.

#### **5.5.2.2 Permanent Impoundments**

No permanent impoundments will be left following reclamation.

### **5.5.3 Backfilling and Grading**

Plans for backfilling and grading of the site upon reclamation have been presented in Section 5.4.2.2. This plan was designed to comply with the applicable requirements of R645-301-500 and R645-301-700. As indicated in Section 5.4.2.2, backfilling and grading operations will be conducted in a controlled manner.

In the area of the Link Canyon Portal and Link Canyon Substation No. 1 and No. 2 pads and access roads, sediment yield from the disturbed areas will be controlled with berms and/or silt fences. The calculations supporting the use of berms and /or silt fences for these areas are presented in Appendix 7-15. Undisturbed runoff from above the Link Canyon Portal pad area that naturally flowed down the Link Canyon drainage will be diverted under the pad area by the use of a diversion culvert and will be channeled back into the existing Link Canyon drainage. Undisturbed runoff from above the substation pad areas that naturally flowed directly into the existing Link Canyon Road inside ditch will be diverted around the substation pad areas by the use of a diversion ditch and will be channeled back into the existing Link Canyon Road inside ditch. Sediment yield from the undisturbed drainage ditch will be controlled with a silt fence. From the point that the Substation No. 2 undisturbed drainage reenters the existing Link Canyon Road ditch the existing road ditch drainage flows for about 30' along the inside of the road before the flow is diverted across the road by an existing water bar where the flow is directed toward the channel at the bottom of Link Canyon. This drainage is by Division definition an intermittent stream. However, water only flows in this canyon in the substation areas as the result of snow melt runoff or the occasional summer thunderstorm.

~~Within the Pines Tract area, the only surface disturbance will be a ventilation/escape way breakout that is anticipated being less than 0.017 acres in area. This breakout is anticipated as occurring on the south wall of Muddy Canyon below the confluence of Box Canyon and Muddy Creek Canyon. All construction for this site will be from within the mine. Sediment yield from this limited area will be controlled with berms and/or silt fences. The limited area of this disturbance and the control measures to be implemented will have minimal impact on the Muddy Creek Drainage.~~

**Acidity, Total Suspended Solids, and Total Dissolved Solids.** Probable impacts of mining and reclamation operations to the acidity and total suspended solids concentrations of surface and

approved UPDES points. The disturbed area associated with the South portals is 0.017 acre. The disturbed area associated with the 3 East portals is 0.017 acre. The disturbed area associated with the Quitchupah portals is 0.017 acre.

A calculation demonstrating the insignificance of the inflow of surface water into the mine is included in Appendix 7-16.

Several alternate sediment control areas are defined within the mine site and are listed below (see Plates 5-2B,C,&D):

- The original substation pad area and fire water tank above the office building. The sediment controls include a graveled pad area and silt fences. The disturbed area is 0.324 acre.
- The topsoil stockpile near the mine site sedimentation pond. The sediment control is silt fencing. The disturbed area is 0.105 acre.
- The subsoil and sedimentation pond topsoil stockpiles at the waste rock disposal site. The sediment controls include containment berms and silt fencing. The disturbed area of the subsoil stockpile is 0.51 acre. The disturbed area of the pond topsoil pile is 0.293 acre.
- The area above the mine fan in East Spring Canyon. The sediment control consists of silt fencing. The disturbed area is 0.122 acre.
- The pump house in Convulsion Canyon. The sediment control consists of containment berms and silt fencing. The disturbed area is 0.075 acre.
- The leach field in Convulsion Canyon. The sediment control consists of containment berms and silt fencing. The area is fenced to prevent grazing. The disturbed area is 0.40 acre.
- The new substation pad disturbed area is 0.287 acre. The sediment controls include gravel and silt fences.
- The 4 East portal site consists of a pad area where a mine fan has been built. The disturbed area associated with the two portal openings at this site is 0.70 acre. Alternate sediment control at this pad consists of a containment berm and silt fencing.
- ~~• The Muddy Canyon portal site will consist of a ventilation/emergency escape way breakout. The disturbed area associated with the portal openings at this site is anticipated to be approximately 0.017 acre. Alternate sediment control at this pad consists of a containment berm and silt fencing. All access to the site will be from within the mine.~~
- The Link Canyon Substation No. 1 facility disturbed area is 0.18 acre. The sediment control consists of containment berms, gravel and silt fencing.
- The Link Canyon Substation No. 2 facility disturbed area is 0.12 acre. The sediment control consists of containment berms, gravel and silt fencing.

- The Link Canyon Portal facility disturbed area is 0.14 acre. The sediment control consists of containment berms, gravel and silt fencing.

The total area for Alternate Sediment Control Areas (ASCA) is ~~3.2733~~3.256 acres. This is approximately ~~11.811.7~~ percent of ~~27.75727.740~~ acres of total disturbed area at the mine site, Link Canyon Portal and Substation No. 1 and No. 2 facility sites, ~~Muddy Canyon ventilation/emergency escape way breakout~~ and waste rock disposal site (including ASCA's and SAE's).

From the final analysis of the 25-year, 6-hour storm event, the maximum inflow rate to the sediment trap from storm runoff is 2.0 cubic feet per second (cfs) and the maximum outflow rate from the basin is 2.1 cfs. The corresponding high water level in the sediment trap is 7440.0 feet, 1.6 feet below the top of the concrete structure.

The maximum inflow rate to the primary sedimentation pond is 2.65 cfs and the maximum outflow rate is 2.2 cfs. The corresponding high water level is 7418.35 feet, 0.2 feet above the primary spillway flowline, and 1.65 feet below the minimum embankment elevation of 7420.0.

Details for the concrete sediment trap spillway are presented in Appendix 7-8. Details for the primary and emergency spillways on the sedimentation pond can be found on Plate 7-5.

Waste Rock Disposal Site Sedimentation Pond. The sedimentation pond at the waste rock disposal site will adequately pass the 25-year, 6-hour precipitation event through the primary and emergency spillways. Details regarding the spillway design are located in Volume 3 of this M&RP.

**Other Treatment Facilities.** There are no other treatment facilities within the mine permit area.

**Exemptions.** Exemption areas are listed below (see Plate 5-2B):

- The south side of the original substation pad area above the office building. This area is classified as an "Exempt Area". The demonstration for this area is a SEDCAD computer program and is located in Appendix 7-16, Vol. 10. The disturbed area is 0.040 acre.
- The spring collection field in Convulsion Canyon. This area is classified as an "Exempt Area". The demonstration for this area is a SEDCAD computer program and is located in Appendix 7-16, Vol. 10. The area is fenced to prevent grazing. The disturbed area is 0.39 acre.
- The water tank area northeast of the mine site. This area is classified as an "Exempt Area". The demonstration for this area is a SEDCAD computer program and is located in Appendix 7-16, Vol. 10. The disturbed area is 0.193 acre.

The total disturbed area contributing to the East Spring Canyon sedimentation pond is 15.88 acres. The total disturbed area contributing to the waste rock disposal site sedimentation pond is 7.93 acres. The total area for Small Area Exemption (SAE) is 0.623 acres. This is 2.2 percent of ~~27.757~~27.740 acres of total disturbed area at the mine site, Link Canyon Portal and

Substation No. 1 and No. 2 facility sites, ~~Muddy Canyon ventilation/emergency escape way breakout~~ and waste rock disposal site (including ASCA's and SAE's).

#### **7.4.2.3 Diversions**

**General Requirements.** The diversions within the permit area consist of drainage ditches and culverts. All diversions within the permit area have been designed to minimize adverse impacts to the hydrologic balance, to prevent material damage outside the permit area and to assure the safety of the public.

All diversions and diversion structures have been designed, located, constructed, maintained and used to:

- Be stable
- Provide protection against flooding and resultant damage to life and property
- Prevent, to the extent possible, additional contributions of suspended solids to stream flow outside the permit area
- Comply with all applicable local, state, and federal laws and regulations

All diversions within the permit area are temporary and will be removed when no longer needed. The diversions will be reclaimed in accordance with the reclamation plan defined in Chapter 5.

Peak discharge rates from the undisturbed and disturbed area drainages within the permit area were calculated for use in determining the adequacy of the existing diversion ditches and culverts. The storm runoff calculations for the temporary diversion structures were based on the 10-year, 6-hour precipitation event of 1.3 inches. Curve numbers were based on those defined in Appendix 7-9 and professional judgement. A description of the methods used to determine the peak discharge rates is presented in Appendix 7-10.

The disturbed and undisturbed drainage areas for the facilities area are presented on Plate 7-7. Those drainage areas too large to fit on Plate 7-7 can be found on Plate 7-8. A summary of watershed characteristics is presented in Table 7-6. The disturbed and undisturbed drainage areas for the Link Canyon facilities area are presented on Plate 5-2D. Link Canyon diversion calculations and designs are presented in Appendix 7-12.

# M&RP TEXT PAGES

## CLEAN FORMAT

(Without redline and strikeout)

INSERT ONLY  
THESE NEW TEXT PAGES  
IN M&RP

- |    |                                    |  |
|----|------------------------------------|--|
| 1. | First coal produced                | 1941   |
| 2. | Termination of mining activity     | December, 2016                               |
| 3. | Horizontal extent of mine workings | 24,579.92 acres<br>(Life of mine)            |
| 4. | Vertical extent of mine workings   | Surface to 2,000 feet deep<br>(Life of mine) |

The anticipated total acreage to be affected during the five years of operation by underground mining activities is 1,500 acres. The estimated number of total surface acres to be affected over the entire mining operation is 46.156 acres.

	PERMITTED DISTURBED AREA <u>BOUNDARY</u>	ACTUAL AREA CURRENTLY DISTURBED <u>TO BE RECLAIMED</u>	<u>SITE DESCRIPTION</u>
	28.084	16.758	Mine Site, East Spring Canyon
	0.286	0.017	3 East Portals
	1.774	0.70	4 East Portals
	0.302	0.017	South Portals
	0.396	0.017	Quitcupah Portals
	0.967	0.39	Spring Collection Field, Convulsion
Canyon	0.220	0.075	Pump House, Convulsion Canyon
	0.784	0.40	Leach Field, Convulsion Canyon
	1.595	0.193	Water Tank, East Spring Canyon
	0.287	0.18	Substation, Link Canyon No. 1
	0.245	0.12	Substation, Link Canyon No. 2
	0.230	0.14	Link Canyon Portal
	<u>10.986</u>	<u>8.733</u>	<u>Waste Rock Disposal Site</u>
	46.156	27.740	Totals

The permit area, which is the same as the lease area legal descriptions in Section 114, includes 23,939.92 acres of Federal coal leases, 640 acres of fee coal leases, the 40 acres waste rock disposal site and 13.03 acres under U.S. Forest Service special use permit for a total of 24,632.95 acres.

### **117 Insurance and Proof of Publication**

Certificates of Insurance issued to Canyon Fuel Company, LLC are located in Appendix 8-1. A copy of an updated Certificate of Liability Insurance is attached as Appendix 117-A.

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**LIST OF APPENDICES**

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2-7	(Revisions have eliminated this appendix)
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2-9	Link Canyon Portal Vegetation, Aquatic Fauna, and Soil Investigations

## ***2.20 Environmental Description***

The SUFCO Mine area lies in central Utah at the southern end of the Wasatch Plateau. Topography is dominated by plateaus separated by deeply incised canyons. Canyon walls are generally composed of laterally continuous (several thousand feet) ledge-forming sandstones, interbedded with slope forming shales and siltstones. Topography in the SUFCO Mine area ranges from 6500 to about 9,000 feet above sea level. Soils are generally not cultivated due to their thin nature, shortage of irrigation water, and a short growing season. Residual and colluvial soils are present at the SUFCO Mine surface facilities area. These soils have formed from residual sandstone and shale particles that mixed as they migrated down slope. Soils are usually very shallow, consisting predominantly of sand and silty sand loams which have high percolation rates. The soils are highly susceptible to wind erosion. The inherent erosion hazard from water is low. Rock outcrops consist of alternating layers of sandstone and shale. Subordinate amounts of coal and limestone are also present. The landscape is steep and rocky with massive sandstone ledges, and siltstone/shale slopes. Surface and subsurface layers are often rocky.

### ***2.2.1 Prime Farmland Investigation***

No prime farmland exists in the SUFCO Mine disturbed area, Link Canyon disturbed area, or in any of its lease areas. Mining activities will not impact prime farmland. In compliance with R645-302-313, a pre-application investigation was conducted by the Applicant to determine if any prime farmland would be impacted by the project. Based on the criteria in 30 CFR 783.27 paragraph (b), the Convulsion Canyon area, Link Canyon, and the Pines Tract area cannot be classified as prime farmland. Consultation with Dr. Theron B. Hutchings, State Soil Scientist for the Soil Conservation Service, substantiated the absence of prime farmland in the Convulsion Canyon and Link Canyon areas. (Appendix 2-1).

### ***2.2.2 Soil Survey***

A Level I soil survey of the entire SUFCO Mine disturbed area, including the Link Canyon Substations No. 1 and 2, has been conducted. Soil survey data are presented in Appendix 2-2 for the majority of the permit area, Appendix 2-6 for the Link Canyon Substation areas,

and are herein summarized in Sections 2.2.2.1 through 2.2.2.3. Survey data includes the following information: taxonomic classification, horizon name and depth, dry and moist color, texture (percent sand, silt, and clay), class, structure, percent rock fragments and organic matter, pH, effervescence, EC, and solubility of calcium, magnesium, and sodium (Appendices 2-2, and 2-6). A cross-reference list of map unit, soil taxonomic classification, and sample site appears in pages 17 through 19 of Appendix 2-2.

An Order 2 soil survey has been completed for the Link Canyon Substation No. 1 disturbed area and is included in Appendix 2-2. Additionally, an Order 1 soil survey was conducted of the substation Nos. 1 and 2 pad areas and the results are included in Appendix 2-6.

An Order 3 soil survey has been conducted for the Pines Tract and the results are included in Appendix 2-8. (Plate 2-2)

#### ***2.2.2.1 Soils Map***

Plates 2-1 and 2-2 delineates the soil types present in the disturbed and adjacent areas.

#### ***2.2.2.2 Soil Identification***

Soils present in the narrow V-shaped East Spring Canyon, which lie within and immediately adjacent to the disturbed area of the SUFCO Mine have been identified, characterized, and their spatial occurrences documented (Appendix 2-2). Four soil types are present in the disturbed area, and are herein referred to as soil types O, W, T, and X (Plate 2-1). Soil type O is a loamy-skeletal, mixed, frigid Ustic Torriorthent. Soil W is a loamy-skeletal, mixed, frigid Typic Xerothent. Soil type T is a loamy-skeletal, mixed, frigid, Calcixerollic Xerochrept. Soil X is a complex composed of both a clayey-skeletal, mixed, frigid, shallow Lithic Calcixeroll, and a fine, mixed, frigid Mollic Haploxeralf.

### Pines Tract

The general description of the soils within the Pines Tract is provided in Appendix 2-8.

#### **2.2.2.4 Soil Productivity**

In areas where soil disturbance has resulted from mining activities, the soils have lost their native identities. In most cases the soils have been quite thoroughly mixed. As a result, soil textures and horizons have been altered. Textures are now primarily loams and silty clay loams; depths over indurated material or shale are generally greater than 30 inches, except along "cut" slopes of the mountain where geologic strata are exposed.

As a result of this disturbance in "fill" areas, the potential for reclamation has been enhanced. The soils are deeper and the resulting textures are more desirable for plant growth.

Saturation percentages are unavailable. When the original sampling and analyses of soils for the portal yard area were completed, saturation percentage was not required by the regulatory agencies.

Electrical conductivity and other analytical data for soils of the disturbed area, soil types O, W, T, and X, are found in Tables 51, 56, 53, 57, and 58, of Appendix 2-2, respectively. These data reveal a high percentage of rock fragments which may limit fertility for both topsoil and subsoil. Vegetation associated with these soils regarding soil productivity are presented (as recommended by the Soil Conservation Service) in Appendix 2-2 and discussed in Chapter 3 of the Mining Reclamation Plan (MR&P).

#### **2.2.3 Prime Farmland Soil Characterization**

No prime farmland exists in the permit area (see Section 2.2.1).

## **2.30 Operation Plan**

### **2.3.1 General Requirements**

#### **2.3.1.1 Removing and Storing Soil Methods**

The SUFCO Mine has been in operation since 1941. At the time the main facilities in East Spring Canyon were constructed, no topsoil was segregated and saved. Topsoil and other fill material was used in construction of the surface facilities pad. However, soils removed from the Link Canyon Substation No. 1 area are to be stored in the outslope of the substation pad. Additionally, the soils removed from the Link Canyon Substation No.2 area will be stored in a small stockpile adjacent to the substation pad. The mix of topsoil and subsoil will be used as substitute topsoil at the time of reclamation. Soils removed from the Link Canyon Mine Portal area will be stored in a topsoil pile located south of the disturbed portal pad area out of the floodplain (Plate 5-2F). The majority of the portal area has been previously disturbed and only thin topsoil layers exist in portions of the disturbed area. Topsoil will be carefully removed with efforts made to minimize the amount of subsoil salvaged since most of the subsoils are not suitable as substitute topsoil or growth media.

The methods described herein are followed when removing and storing soil resources that necessitate removal as a result of construction of new surface operations.

Soil salvage will take place in two lifts where possible. The first lift will include the A horizon material to be stockpiled in one location and the second lift will include the remaining B and C horizons, excluding material with a coarse fragment content of over 50 percent. The latter would be stockpiled in a third, but adjacent location. These stockpiles will be graded to gradual slopes (3h:1v) and seeded to promote surface stabilization.

soils. During the topsoil removal process, a moisture level of at least 15% will be maintained in the soils to reduce dust and loss of the resource. Maintaining soil moisture may be accomplished using a water truck equipped with pumps and hoses and personnel assigned to spraying the dry soils prior to and during salvage operations. In areas where Creeping Oregon Grape is present, the soils will be removed and temporarily stored separately until the topsoil pile is constructed. At that time, the soils containing the grape will be placed as the top layer of soil, thus encouraging the establishment of oregon grape.

The sewer leach field for the mine site buildings will be expanded and two new water holding tanks will be buried in place at the existing pump house in the Fall of 2001. In both cases, the soils at these two locations have been disturbed in the past. A field investigation conducted

Topsoil from the Link Canyon Substation No. 1 will be placed and stored on the outslope of the pad. This storage area will be protected with berms and/or silt fences, a three-strand barbwire fence, and revegetated to control erosion. This soil will not be moved or disturbed until it is required for redistribution during final reclamation.

Soil from the Link Canyon Substation No. 2 will be placed in a soil stock pile located at the south end of the pad area. The storage area will be protected with berms and/or silt fences, a three strand barbwire fence, and revegetated to control erosion. This soil will not be moved or disturbed until it is required for redistribution during final reclamation.

Soil from the Link Canyon Mine Portal area will be placed in a topsoil pile located south of the disturbed portal pad area out of the floodplain (Plate 5-2F). The storage area will be protected by installing a topsoil storage sign at the base of the pile, berms and/or silt fences, a three strand barbwire fence, and protected from wind and water erosion by surface pitting the stockpile to retain moisture and reduce erosion and by being revegetated with a quick growing vegetative cover (standard seed mix in section 3.4.1.2 minus the shrubs and trees) to control erosion. This soil will not be moved or disturbed until it is required for redistribution during final reclamation. The surface of the topsoil pile will be pitted to reduce runoff and erosion. Cuttings of Creeping Oregon Grape salvaged from the area during initial site construction will be buried in the top few inches of the pile. Establishment of this plant should reduce erosion of the pile. Additionally, vegetation removed during site construction, such as sage brush and other woody plants, will be placed on top of the pile.

Excess subsoil associated with construction of a run of mine coal stockpile is stored at SUFCO Mine's 40-acre waste rock disposal site (see Section 3.1.6 of Volume 3 of this M&RP). This material is segregated and will be available for fill during the reclamation phase of the mine site if needed. About 1,100 cubic yards of topsoil are stored immediately west of the subsoil pile.

#### ***2.3.2.4 Minor Disturbances Not Requiring Topsoil Removal***

***Small Structures.*** Topsoil will not be removed prior to construction resulting in only minor disturbances as described in R645-301-232.400. Such construction activity includes work on small structures such as power poles, signs, fence lines, and other small structures which do not significantly disturb the site.

***Vegetation.*** SUFCO Mine will not remove topsoil for minor disturbances where such activity will not destroy vegetation or cause erosion.

#### ***2.3.2.5 Subsoil Segregation***

Due to the poor quality of the subsoil, the B and C soil horizons will not be individually segregated and stockpiled. The topsoil will be segregated and stockpiled separately from the subsoil (B & C horizons) except in the area of the Link Canyon Substations Nos. 1 and 2, and Link Canyon Mine Portal. These soils will be salvaged as specified in Section 2.3.2.1

#### ***2.3.2.6 Timing***

Where possible, soil removal will take place after all vegetation has been removed that could interfere with soil salvage. Surface disturbance activities will take place after the soil has been removed.

#### ***2.3.2.7 Topsoil and Subsoil Removal Under Adverse Conditions***

In areas of surface disturbance, topsoil and subsoil will be each removed separately and segregated, except where natural conditions render operations hazardous.

***Conventional Machines.*** In localities where steep grades, adverse terrains, severe rockiness, limited depth of soils, or other adverse conditions exist that render soil removal and segregation activities using conventional machines hazardous, soils will not be salvaged and stockpiled.

Substation No. 2 will be stored in the soil stockpile as shown on Plate 5-2E. Topsoil removed from the Link Canyon Mine Portal area will be stored in the soil stockpile as shown on Plate 5-2F.

***Protection from Contaminants and Compaction.*** Stockpiled topsoil shall be protected from contaminants and unnecessary compaction. To protect the topsoil from contaminants and unnecessary compaction that could interfere with vegetation, the sediment pond topsoil and the substation stockpiles are isolated with no means of access from the main surface area (Section 2.3.1.4). A topsoil storage sign was installed at the base of both stockpiles and will be placed on the Link Canyon Substations Nos. 1 and 2 and Link Canyon Mine Portal storage areas.

***Wind and Water Erosion Protection.*** All topsoil stockpiles will be protected from wind and water erosion by prompt establishment and maintenance of a vegetative cover (standard seed mix in section 3.4.1.2 minus the shrubs and trees). The sediment pond and substation topsoil stockpiles are protected from wind and water erosion by the establishment of a protective vegetative cover. The Link Canyon Portal topsoil pile will be protected by establishment of Creeping Oregon Grape and by adding vegetative material removed during site construction. Grasses native to the area will be planted either through seeding or by obtaining and planting plugs from nearby undisturbed sites. A silt fence was installed below the stockpiles to help trap sediment runoff from the stockpiles.

***Topsoil Redistribution.*** All stockpiled topsoil will not be moved until redistributed during reclamation operations unless approved by the UDOGM.

#### ***2.3.4.3 Topsoil Stockpile Relocation***

Stockpiled topsoil in jeopardy of being detrimentally affected in terms of its quantity and quality by mine operations may be temporarily redistributed after approval from the UDOGM.

## **2.40 Reclamation Plan**

### **2.4.1 General Requirements**

Topsoil redistribution, amendments, and stabilization are discussed in Sections 2.4.2, 2.4.3, and 2.4.4, respectively.

### **2.4.2 Soil Redistribution**

#### **2.4.2.1 Soil Redistribution Practices**

In addition to the redistribution practices discussed herein, the following action will be taken. Within the disturbed areas the contaminated surface soil layer will be removed and stored during the final reclamation process. The contaminating gravels, crushed stone, and other contaminants will be buried along with the structure foundations.

**Soil Thickness.** Topsoil will be distributed on all areas with slopes less than 1h:l.5v that are to be reclaimed. Topsoil redistribution procedures will ensure an approximate uniform thickness of six inches. During this time period, the topsoil will be allowed to settle and attain equilibrium with its natural environment. This procedure will be followed for all areas in which facilities such as road beds, mine pads, and building sites are to be abandoned.

**Compaction.** To prevent compaction of topsoil, soil moving equipment will refrain from unnecessary operation over spread topsoil. Front-end-loaders and other wheel mounted equipment may be used to transport and dump topsoil. However, to minimize compaction, only track-mounted equipment (example bulldozer) will be used to spread the topsoil. The topsoil will be disced or ripped, surface roughened, pitted, and/or deep gouged prior to seeding to help alleviate soil compaction, increase soil stability, and to increase water harvesting.

In the 300,000 gallon fire water tank area, the concrete foundation of the water tank will be broken up and placed against the base of the cutslope. The fill material used to create the foundation pad will be used first to backfill the tank area. The remainder of the fill necessary

for reclamation will be obtained from the subsoil stock pile at the waste rock site. Finally, the topsoils will be returned to the site for distribution. The thickness of the redistributed topsoil should roughly equal six inches, the thickness originally removed.

**Erosion.** Procedures will be exercised to ensure the stability of topsoil on graded slopes to guard against erosion during and after topsoil application. Erosion control measures will include surface roughing, pitting, deep gouging, and/or placement of organic matting on slope areas thought to be unstable.

#### ***2.4.2.2 Regrading***

Since the mine is over 55 years old, there are no private or public topographic maps which can be used to accurately determine the original geometric configuration of the canyon. Prior to topsoil redistribution, the disturbed area will be regraded to agree with final reclamation topography (Chapter 5 and Plate 5-3).

The postmining topography was designed by Sergent, Hauskins & Beckwith's (SH&B) (Appendix 2-4). The cut and fill quantities are 74,734 and 71,173 yards, respectively (Appendix 2-5). These values supersede those presented in Appendix 2-4.

Management Unit is located adjacent to the MMA Management Unit. Although this direction does not apply to the adjacent MMA Management Unit where the current proposal is located, the Manti-La Sal National Forest Record of Decision considered this management direction. Direction for operations in adjacent GWR Management Units calls for minimizing potential conflicts. The current proposal will have negligible effects to wintering big game because there will be very little activity at the site following the initial short-term construction activity (pages 14-15, Manti-La Sal National Forest, SUFCO Mine Link Canyon Portal Record of Decision, Oct. 10, 2002). The area will be surveyed for raptor nests. If any are found within the prescribed buffer zone, they will be monitored for activity and work at the portal site will occur following the same guidelines as those described for the Link Canyon Substation.

The applicant has implemented a program to monitor the effect of subsidence on the vegetative communities. The applicant uses color infrared photography (CIR) to document changes to vegetation. This CIR coverage was begun in 1987 and will be updated at least every 5 years.

The riparian vegetation within upper Box Canyon adjacent to the 150 acre lease modification is of special concern to the permitting agencies and the permittee. Because of this concern, SUFCO commits to monitoring the effects of subsidence on the riparian vegetation within the upper Box Canyon by including this area within the color infrared photography monitoring program described in the preceding paragraph. Previous infrared surveys have included most of the 150 acre lease modification area and upper Box Canyon. These previous surveys will be used to provide baseline data for the monitoring of subsidence effects, if they occur, on the riparian vegetation within the area. This data will be reviewed by qualified personnel to make determinations concerning the effects of subsidence on the riparian vegetation.

A survey will be conducted to locate representative populations of vegetation growing within bedding planes and fractures in the walls of Box Canyon. The location of the populations will be recorded using a topographic map and a GPS survey will be used to verify the coordinates. Photographs of the vegetation will be taken during the survey. The survey will be conducted

producer. Christmas tree cutting, however, is higher in this community type than others in the area.

The ponderosa pine type is the only vegetation community receiving substantial use for timber production. This type generally occurs on flatter sandy sites and is readily accessible. Large, mature (250 + years) trees have been harvested on a selective basis. Pine regeneration in cut over stands is sparse and mountain mahogany and manzanita appear to be increasing in the understory. Within the SUFCO Mine Quitchupah lease area approximately 528 thousand board feet (MBF) have been harvested between 1977 and 1978 with average volumes of 1.3 average net volume/acre (M. Stubbs personal correspondence, 1979). Quaking aspen stands receive limited local pressure for posts and poles.

The vegetation communities supported in the Pines Tract area are discussed in Chapter 3 of this M&RP.

***Land Use Description.*** The leased areas lie within the Manti-La Sal and Fishlake National Forests and are subject to the Land and Resource Management plans prepared by the agency. These plans identify the principle use of the lease areas as rangeland with small areas set aside for timber harvesting and as general big game range. Recreation in the lease areas includes camping, firewood gathering, hunting, some snowmobiling, and sight seeing from late spring to late fall. Yearly recreation use is light, but during deer and elk hunts, use is extremely heavy.

There are no developed or inventoried recreation campgrounds on the lease areas. The mining operation will not impact any of these uses and will preserve the uses into the postmining period.

The timber on the lease areas are open grown Ponderosa pine. All commercial stands occur on the benches. Trees are of low quality because of the poor tree growing site. Cutting is limited to older over-matured trees and occurs infrequently. No adverse timber impacts are anticipated.

using full-support methods) to Monitor Schedule B (Sites in areas which will be mined under and subsided) requiring the implementation of additional monitoring of the site. Monitoring results will be provided in DOGM Annual Reports. (2003, 2004, 2005, 2006, and indefinitely until movement ceases)

#### ***4.2.3 Monitoring Program***

The UDOGM does not require an air monitoring program for the SUFCA underground mine at this time. The mine currently operates under Division of Air Quality approval orders BAQE-126-88 Waste Rock Disposal Site dated April 1, 1988 and DAQE-714-98 SUFCA Mine site dated October 28, 1998 found in Appendix 4-4.

is only temporarily stored at the mine prior to off-site disposal, there is no significant potential for this debris to spontaneously combust. Fire extinguishers are kept on mobile equipment in the mine yard to extinguish any fires should combustion of the waste materials occur. Waste materials that constitute a fire hazard (e.g., grease, lubricants, paints, and flammable liquids) will be stored in such a manner as to minimize any fire hazard. Empty containers of such products will only be stored temporarily at the mine-site prior to proper off site disposal.

#### ***5.2.8.4 Dams, Embankments, and Impoundments***

No dams, embankments, or impoundments are used for the handling or disposal of coal, overburden, excess spoil, or coal mine waste in the permit area.

#### ***5.2.9 Management of Mine Openings***

Ten underground mine openings exist within the permit area. Locations of these portals are shown on Plates 5-2A,C,&F. Three of these openings are located at the mine surface facilities in East Spring Canyon and serve as primary pathways for ingress and egress of personnel and machinery, removal of coal from the mine, and mine ventilation. The remaining seven openings are located as follows:

- 3 East portals - 2 intakes
- Quitcupah portals - 2 intakes
- 4 East portals - 1 intake and 1 fan portal
- Link Canyon Portal - 1 intake

These remaining (non-East Spring Canyon) openings are used for mine ventilation and emergency egress. Each of these supplementary intakes is protected from unauthorized entry by the installation of steel sets and a locked chain-link gate. The keys for the gates are kept approximately 25 feet from the gates inside the mine. This permits emergency exit from the mine but prevents entrance from the outside.

## ***5.50 Reclamation Design Criteria and Plans***

### ***5.5.1 Casing and Sealing of Underground Openings***

Each underground opening to the mine will be sealed and backfilled when no longer needed for monitoring or other use approved by the UDOGM upon a finding of no adverse environmental or health and safety effects. Permanent closure measures will be as described in Section 5.4.2.7. This closure method has been designed to prevent access to the mine workings by people, livestock, fish and wildlife, and machinery. The closures have also been designed to keep water from flowing from the mine workings to prevent acid or other toxic drainage from entering ground and surface waters.

### ***5.5.2 Permanent Features***

#### ***5.5.2.1 Small Depressions***

During final grading and spreading of topsoil, small depressions will be left in the soil. The purpose of these depressions will be to retain moisture, minimize erosion, and assist revegetation.

#### ***5.5.2.2 Permanent Impoundments***

No permanent impoundments will be left following reclamation.

### ***5.5.3 Backfilling and Grading***

Plans for backfilling and grading of the site upon reclamation have been presented in Section 5.4.2.2. This plan was designed to comply with the applicable requirements of R645-301-500 and R645-301-700. As indicated in Section 5.4.2.2, backfilling and grading operations will be conducted in a controlled manner.

In the area of the Link Canyon Portal and Link Canyon Substation No. 1 and No. 2 pads and access roads, sediment yield from the disturbed areas will be controlled with berms and/or silt fences. The calculations supporting the use of berms and /or silt fences for these areas are presented in Appendix 7-15. Undisturbed runoff from above the Link Canyon Portal pad area that naturally flowed down the Link Canyon drainage will be diverted under the pad area by the use of a diversion culvert and will be channeled back into the existing Link Canyon drainage. Undisturbed runoff from above the substation pad areas that naturally flowed directly into the existing Link Canyon Road inside ditch will be diverted around the substation pad areas by the use of a diversion ditch and will be channeled back into the existing Link Canyon Road inside ditch. Sediment yield from the undisturbed drainage ditch will be controlled with a silt fence. From the point that the Substation No. 2 undisturbed drainage reenters the existing Link Canyon Road ditch the existing road ditch drainage flows for about 30' along the inside of the road before the flow is diverted across the road by an existing water bar where the flow is directed toward the channel at the bottom of Link Canyon. This drainage is by Division definition an intermittent stream. However, water only flows in this canyon in the substation areas as the result of snow melt runoff or the occasional summer thunderstorm.

***Acidity, Total Suspended Solids, and Total Dissolved Solids.*** Probable impacts of mining and reclamation operations to the acidity and total suspended solids concentrations of surface and

of routing runoff from disturbed areas into the mine with berms and insloping. The runoff is then treated using in mine settling ponds prior to discharge through approved UPDES points. The disturbed area associated with the South portals is 0.017 acre. The disturbed area associated with the 3 East portals is 0.017 acre. The disturbed area associated with the Quitchupah portals is 0.017 acre. A calculation demonstrating the insignificance of the inflow of surface water into the mine is included in Appendix 7-16.

Several alternate sediment control areas are defined within the mine site and are listed below (see Plates 5-2B,C,&D):

- The original substation pad area and fire water tank above the office building. The sediment controls include a graveled pad area and silt fences. The disturbed area is 0.324 acre.
- The topsoil stockpile near the mine site sedimentation pond. The sediment control is silt fencing. The disturbed area is 0.105 acre.
- The subsoil and sedimentation pond topsoil stockpiles at the waste rock disposal site. The sediment controls include containment berms and silt fencing. The disturbed area of the subsoil stockpile is 0.51 acre. The disturbed area of the pond topsoil pile is 0.293 acre.
- The area above the mine fan in East Spring Canyon. The sediment control consists of silt fencing. The disturbed area is 0.122 acre.
- The pump house in Convulsion Canyon. The sediment control consists of containment berms and silt fencing. The disturbed area is 0.075 acre.
- The leach field in Convulsion Canyon. The sediment control consists of containment berms and silt fencing. The area is fenced to prevent grazing. The disturbed area is 0.40 acre.
- The new substation pad disturbed area is 0.287 acre. The sediment controls include gravel and silt fences.
- The 4 East portal site consists of a pad area where a mine fan has been built. The disturbed area associated with the two portal openings at this site is 0.70 acre. Alternate sediment control at this pad consists of a containment berm and silt fencing.
- The Link Canyon Substation No. 1 facility disturbed area is 0.18 acre. The sediment control consists of containment berms, gravel and silt fencing.
- The Link Canyon Substation No. 2 facility disturbed area is 0.12 acre. The sediment control consists of containment berms, gravel and silt fencing.
- The Link Canyon Portal facility disturbed area is 0.14 acre. The sediment control consists of containment berms, gravel and silt fencing.

The total area for Alternate Sediment Control Areas (ASCA) is 3.256 acres. This is approximately 11.7 percent of 27.740 acres of total disturbed area at the mine site, Link Canyon Portal and Substation No. 1 and No. 2 facility sites, and waste rock disposal site (including ASCA's and SAE's).

From the final analysis of the 25-year, 6-hour storm event, the maximum inflow rate to the sediment trap from storm runoff is 2.0 cubic feet per second (cfs) and the maximum outflow rate from the basin is 2.1 cfs. The corresponding high water level in the sediment trap is 7440.0 feet, 1.6 feet below the top of the concrete structure.

The maximum inflow rate to the primary sedimentation pond is 2.65 cfs and the maximum outflow rate is 2.2 cfs. The corresponding high water level is 7418.35 feet, 0.2 feet above the primary spillway flowline, and 1.65 feet below the minimum embankment elevation of 7420.0.

Details for the concrete sediment trap spillway are presented in Appendix 7-8. Details for the primary and emergency spillways on the sedimentation pond can be found on Plate 7-5.

Waste Rock Disposal Site Sedimentation Pond. The sedimentation pond at the waste rock disposal site will adequately pass the 25-year, 6-hour precipitation event through the primary and emergency spillways. Details regarding the spillway design are located in Volume 3 of this M&RP.

**Other Treatment Facilities.** There are no other treatment facilities within the mine permit area.

**Exemptions.** Exemption areas are listed below (see Plate 5-2B):

- The south side of the original substation pad area above the office building. This area is classified as an "Exempt Area". The demonstration for this area is a SEDCAD computer program and is located in Appendix 7-16, Vol. 10. The disturbed area is 0.040 acre.
- The spring collection field in Convulsion Canyon. This area is classified as an "Exempt Area". The demonstration for this area is a SEDCAD computer program and is located in Appendix 7-16, Vol. 10. The area is fenced to prevent grazing. The disturbed area is 0.39 acre.
- The water tank area northeast of the mine site. This area is classified as an "Exempt Area". The demonstration for this area is a SEDCAD computer program and is located in Appendix 7-16, Vol. 10. The disturbed area is 0.193 acre.

The total disturbed area contributing to the East Spring Canyon sedimentation pond is 15.88 acres. The total disturbed area contributing to the waste rock disposal site sedimentation pond is 7.93 acres. The total area for Small Area Exemption (SAE) is 0.623 acres. This is 2.2 percent of 27.740 acres of total disturbed area at the mine site, Link Canyon Portal and

Substation No. 1 and No. 2 facility sites, and waste rock disposal site (including ASCA's and SAE's).

#### **7.4.2.3 Diversions**

**General Requirements.** The diversions within the permit area consist of drainage ditches and culverts. All diversions within the permit area have been designed to minimize adverse impacts to the hydrologic balance, to prevent material damage outside the permit area and to assure the safety of the public.

All diversions and diversion structures have been designed, located, constructed, maintained and used to:

- Be stable
- Provide protection against flooding and resultant damage to life and property
- Prevent, to the extent possible, additional contributions of suspended solids to stream flow outside the permit area
- Comply with all applicable local, state, and federal laws and regulations

All diversions within the permit area are temporary and will be removed when no longer needed. The diversions will be reclaimed in accordance with the reclamation plan defined in Chapter 5.

Peak discharge rates from the undisturbed and disturbed area drainages within the permit area were calculated for use in determining the adequacy of the existing diversion ditches and culverts. The storm runoff calculations for the temporary diversion structures were based on the 10-year, 6-hour precipitation event of 1.3 inches. Curve numbers were based on those defined in Appendix 7-9 and professional judgement. A description of the methods used to determine the peak discharge rates is presented in Appendix 7-10.

The disturbed and undisturbed drainage areas for the facilities area are presented on Plate 7-7. Those drainage areas too large to fit on Plate 7-7 can be found on Plate 7-8. A summary of watershed characteristics is presented in Table 7-6. The disturbed and undisturbed drainage