

PERMIT TRACKING FORM

X Permit Amendment (INS) Exploration Permit (INS) N.O.V. (INS) D.O. Permit Transfer Incidental Boundary Change (IBC)
 Permit Midterm (MT) Permit Renewal (PR) New Permit Significant Revision (SR) Bond Release (BR)

Date Received: 12/10/97	By: Tat	PERMIT NUMBER	ACT/007/020
Title of Proposal: UC-3 Culvert Extension		PERMIT CHANGE #	97D-1
Description:		PERMITTEE	HORIZON COAL COMPANY
# of Copies Required: 5	# of Copies Received: 5	MINE NAME	HORIZON MINE

PERMIT CHANGE APPLICATION SENT TO SLC **DATE:** **LETTER TO PERMITTEE:**

<input type="checkbox"/> 15 DAY INITIAL RESPONSE TO PERMIT CHANGE APPLICATION OR INITIAL COMPLETENESS REVIEW	Date Due:	Date Done:	Letter to Permittee:
<input type="checkbox"/> Notice of Affidavit of Publication. (If change is a Significant Revision, New Permit, or Permit Transfer)	Date Due:	Date Done:	Letter to Permittee:

PFO REVIEW TRACKING	1ST ROUND		2ND ROUND		SLC REVIEW TRACKING	1ST ROUND		2ND ROUND	
<input type="checkbox"/> Lead <input type="checkbox"/> Generalist					<input type="checkbox"/> Lead RAD	1/13			
<input type="checkbox"/> Administrative _____					<input type="checkbox"/> Administrative _____				
<input type="checkbox"/> Land Use/ AQ _____					<input type="checkbox"/> Land Use/ AQ _____				
<input type="checkbox"/> Biology _____					<input type="checkbox"/> Biology SW	1/13			
<input type="checkbox"/> Engineering _____					<input type="checkbox"/> Engineering JK	1/13			
<input type="checkbox"/> Geology _____					<input type="checkbox"/> Geology _____				
<input type="checkbox"/> Soils _____					<input type="checkbox"/> Soils RAD	1/13			
<input type="checkbox"/> Hydrology _____					<input type="checkbox"/> Hydrology SF	1/13			

TA Review Done:	Date:	Permittee Response Due <input type="checkbox"/> Stipulation <input type="checkbox"/> Condition <input type="checkbox"/> No Requirements	Date:	DIVISION DECISION LETTER <input type="checkbox"/> APPROVE <input type="checkbox"/> DENY
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TA Review Done:	Date:	RESPONSE RECEIVED:	Date:	Date:
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COORDINATED REVIEWS	Phone Contact	1ST ROUND		2ND ROUND		RECEIVED	ADDITIONAL TRACKING:	DATE
		Sent	Due	Sent	Due			
<input type="checkbox"/> OSM- Copy							Public Hearing	
<input type="checkbox"/> BLM- Copy							Letter From Compliance Supervisor	
<input type="checkbox"/> BLM (SLC)- Ltr							AVS Completed	
<input type="checkbox"/> Water Rights- ltr							Approval Effective Date	
<input type="checkbox"/> DEQ- Letter							Approved Copy to File	
<input type="checkbox"/> DWR- Letter							Approved Copy to Permittee	
							Approved Copy to PFO/SLC	
							Approved Copy to Agencies	
							CHIA Modified	
							Update Master TA Done/Needed	

Comments:

* Red Binders in drawer #2

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Date Received 09/18/97	By: tat (Initial)	PERMIT NUMBER	ACT/007/020
Title of Proposal: UC-3 Culvert Extension		PERMIT CHANGE #	97D
Description:		PERMITTEE	HORIZON COAL COMPANY
# Copies Required 5	# Copies Received 5	MINE NAME	HORIZON MINE

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<input type="checkbox"/> 15 DAY INITIAL RESPONSE TO PERMIT CHANGE APPLICATION OR INITIAL COMPLETENESS REVIEW	DATE DUE	DATE DONE	LETTER TO PERMITTEE: 7-18-97
<input type="checkbox"/> Notice of Affidavit of Publication. (If change is a Significant Revision, New Permit or Permit Transfer)	DATE DUE	DATE DONE	PUBLIC COMMENT RECEIVED

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	DUE	DONE	DUE	DONE		DUE	DONE	DUE	DONE
<input type="checkbox"/> Lead <input type="checkbox"/> Generalist					<input type="checkbox"/> Lead BOB	10/3	10/3	10/31	
<input type="checkbox"/> Administrative					<input type="checkbox"/> Administrative				
<input type="checkbox"/> Land Use/AQ					<input type="checkbox"/> Land Use/AQ				
<input type="checkbox"/> Biology					<input type="checkbox"/> Biology SUSAN	10/3	10/3	10/31	
<input type="checkbox"/> Engineering					<input type="checkbox"/> Engineering JESS	10/3	9/26	10/31	
<input type="checkbox"/> Geology					<input type="checkbox"/> Geology				
<input type="checkbox"/> Soils					<input type="checkbox"/> Soils BOB	10/3	10/3	10/31	
<input type="checkbox"/> Hydrology					<input type="checkbox"/> Hydrology SHARON	10/3	10/3	10/31	

TA Review Due	Date:	Permitter Response Due <input checked="" type="checkbox"/> Stipulation <input type="checkbox"/> Condition <input type="checkbox"/> No Requirements	Date:	DIVISION DECISION LETTER <input type="checkbox"/> APPROVE <input type="checkbox"/> DENY
TA Review Done	Date:	Response Received	Date: 10-8-97	Date: 10-17-97

COORDINATED REVIEWS	PH CONT	1ST ROUND		2ND ROUND		RECEIVED	ADDITIONAL TRACKING	Date:
		SENT	DUE	SENT	DUE			
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<input type="checkbox"/> BLM (C)							LETTER FROM COMPLIANCE SUPER.	
<input type="checkbox"/> USFWS (L, NA)							AVS COMPLETED	
<input type="checkbox"/> WATER RIGHTS (L)							APPROVAL EFFECTIVE DATE	
<input type="checkbox"/> DEQ (L)							APPROVED COPY TO FILE	
<input type="checkbox"/> UTDWR (L)							APPROVED COPY TO PERMITTEE	
<input type="checkbox"/> ST HISTORY (L, NA)							APPROVED COPY TO PFO/SLC	
							APPROVED COPY TO AGENCIES	
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 Bond Release (BR)

DATE RECEIVED	9/18/97	By: <u>tat</u>	(Initial)	PERMIT NUMBER	ACT/007/020
Title of Proposal:	UC-3 Culvert Extension				
Description:	PERMIT CHANGE # 97D				
# Copies Required	65	# Copies Received	45	PERMITTEE	HORIZON COAL CO.
				MINE NAME	HORIZON

PERMIT CHANGE APPLICATION SENT TO SLC DATE: _____ LETTER TO PERMITTEE: _____

<input type="checkbox"/> 15 DAY INITIAL RESPONSE TO PERMIT CHANGE APPLICATION OR INITIAL COMPLETENESS REVIEW	DATE DUE	DATE DONE	LETTER TO PERMITTEE:
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<input type="checkbox"/> Notice of Affidavit of Publication. (If change is a Significant Revision, New Permit or Permit Transfer)	DATE DUE:	DATE DONE	PUBLIC COMMENT RECEIVED:
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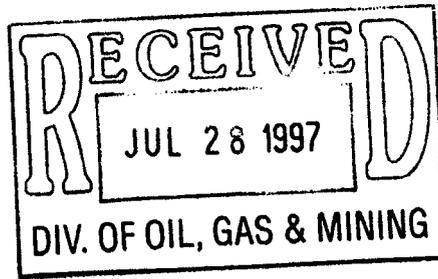
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<input type="checkbox"/> Administrative			<input type="checkbox"/> Administrative		
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<input type="checkbox"/> Hydrology			<input type="checkbox"/> Hydrology <u>Sharon</u>	<u>10/3</u>	<u>10/3</u>

TA Review Due	Date: <u>10/4</u>	Permittee Response Due	Date: <u>10/23/97</u>	DIVISION DECISION LETTER
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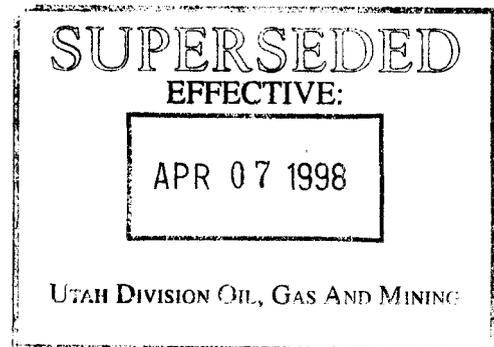
TA Review Done	Date:	Response Received	Date:	Date:
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<input type="checkbox"/> US Forest Service					LETTER FROM COMPLIANCE SUPER.	
<input type="checkbox"/> BLM (C)					AVS COMPLETED	
<input type="checkbox"/> US FWS (L, NA)					APPROVAL EFFECTIVE DATE	
<input type="checkbox"/> BLM, SLC (C)					APPROVED COPY TO FILE	
<input type="checkbox"/> UT SHPO (L, NA)					APPROVED COPY TO PERMITTEE	
<input type="checkbox"/> UT DEQ (L)					APPROVED COPY TO PFO/SLC	
<input type="checkbox"/> UT Water Rights (L)					APPROVED COPY TO AGENCIES	
<input type="checkbox"/> UT Wildlife Resources(L)					CHIA MODIFIED	
<input type="checkbox"/> UT SITLA					UPDATE MASTER TA DONE/NEEDED	

PRICE FIELD OFFICE COMMENTS:	SLC OFFICE COMMENTS:
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CHAPTER 9
VEGETATION RESOURCES



The mine site lies between 7,500 and 7,700 feet above sea level. The climate is characterized by cold winters and warm, dry summers. Average annual precipitation ranges from 12 to 20 inches.

9.4.1 Vegetation Patterns

Since revegetation was never performed on the mine site, a host of exotic plant species have been introduced into the disturbed area. For the Mt. Nebo study plant communities were designated as slightly disturbed, moderately disturbed, and severely disturbed.

The mine permit area has been mapped with several vegetation types including: 1) Oak Brush, 2) Salina Wildrye, 3) Maple/Oak Brush/Aspen, 4) Fir/Aspen, 5) Manzanita, 6) Alpine Herb/Grassland, 7) Sagebrush/Grass/Rabbit Brush, and 8) Disturbed/Altered communities. The map provided delineates these vegetation types within and adjacent to the mine permit boundaries (see Plate 9-1).

Except for a relatively small community of Salina wildrye, most of the proposed disturbance will be on areas that have been previously disturbed by mining activity. A description of the existing vegetation types follow.

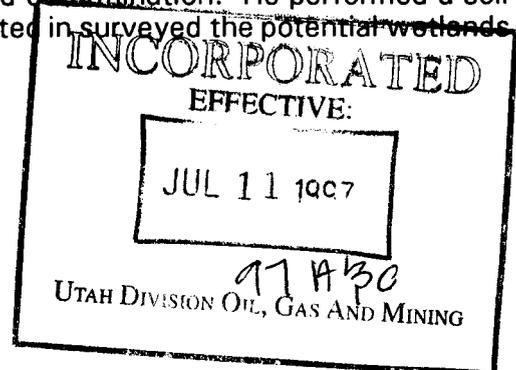
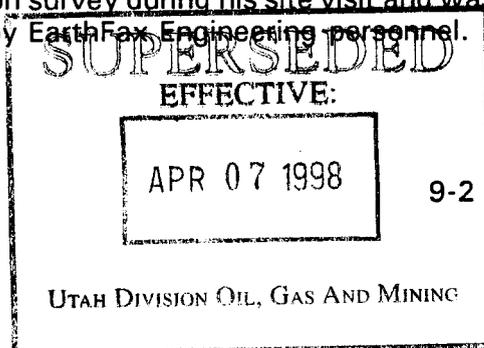
9.4.1.1 Salina Wildrye Community

This is a relatively small area and is the only undisturbed area that proposed mining activity could affect. This community lies primarily on a dry, west-facing slope, with a 60% incline. Previous sampling indicated a mean total living cover of 43.12%. Ninety-two percent of the living cover were grass species. For a species list, refer to Table 9-1.

9.4.1.2 Disturbed, (Altered) Drainage Bottoms

Another area proposed for disturbance is a site previously disturbed or "altered" by mining activity. Because the area is near the bottom of a drainage, the vegetation community patterns are somewhat dissimilar to adjacent slopes. The bottoms probably have somewhat deeper soils, while some of the species are more mesic. The steep side slopes of oak brush and Salina wildrye often protect the bottoms from exposure to the sun. Consequently, small stands of aspen (*Populus tremuloides*), white fir (*Abies concolor*) and oak brush (*Quercus gambelii*) can be found in and around the drainage. Muttongrass (*Poa fenderiana*) is one of the dominate grass species of the bottom lands. For a general species list, refer to Appendix 9-1.

Rick Smith of Engineering Planning Group, was recommended by the Army Corp of Engineers (Corp) as an approved wetland specialist. During a site visit on August 16, 1995, he proposed a visit by personnel from the Corp for wetland determination. He performed a soil and vegetation survey during his site visit and was assisted in surveyed the potential wetlands (0.42 acre) by EarthFax Engineering personnel.



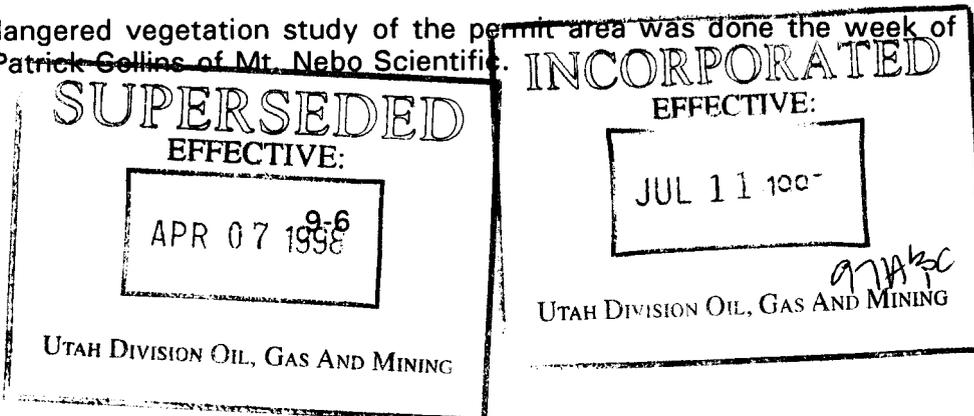
Michelle Waltz of the Corp was contacted to set up a site visit, instead she request that three soil samples be collected at designated locations within the potential wetland area and delivered to the Corp office for evaluation. Jaime of the Corp contacted Vicky Bailey of EarthFax Engineering and stated that "the soil samples they evaluated made the Corp lean towards the determination that the area was not a wetland, however they wanted the Division of Water Rights to visit the site and confirm their decision". The Corp then turned the determination responsibility over to Mark Page from the Division of Water Rights (Water Rights). Mark Page evaluated the site on May 16, 1996. Water Rights and the Corp have determined the Horizon site (0.42 acre) under consideration to be a riparian area not a wetlands.

Rick Smith suggests that the following vegetation exists in the riparian bottom at the Horizon site: Quaking aspen, Common reedgrass, Rush, Clover, Scouring rush, Western cornflower, Big rabbitbrush, Bull thistle, Big sagebrush, Purple aster, Wildrose, Houndstongue, Dandelion, Common tansy, Stinging nettle, Bluegrass, Foxtail Barley, Witchgrass, Cheatgrass and Horsetail. Mt. Nebo Scientific perform a more extensive vegetation survey of the riparian area during the July of 1996. The data and mapping generated by this survey will be incorporated into this permit text and Appendix 9-2. All the information contained in this survey will not be incorporated into this text, but can be referenced directly in Appendix 9-2.

The riparian vegetation within the permit area grows along Jewkes Creek. In the upper portions of the creek the channel is covered by quaking aspen, maple, and oak, with willows growing in the channel sporadically along the banks. The riparian vegetation continues down the channel until it reaches the top of the Horizon disturbed area. Once within the disturbed area the channel splits into several small channels which join at the bottom of the disturbed area and drain into a culvert which drops the flow into a channel which eventually empties into the North Fork of Gordon Creek. Riparian vegetation covers an area of 0.42 acre along Jewkes Creek.

Within the disturbed area the water spreads into multiple channels, covering an area between thirty and fifty feet wide with water and supplying various vegetation. Riparian vegetation grows in the channel directly above the disturbed area and continues for approximately two hundred and forty feet down stream. The riparian vegetation cover is approximately fifty feet wide in this area, it then narrows and shifts sides of the canyon as it proceeds another 600 feet to Consumer/Clear Creek road where it crosses the existing culvert. The riparian vegetation which continues below the culvert is not within Horizon's disturbed area, but is within Horizon's permit area. The undisturbed wet meadow/riparian areas below the sediment pond will be maintained and protected from disturbance by fencing the area at the time of facility construction and thereafter until final bond release. Horizon commits to maintain the riparian vegetation within the fenced area, insuring its continued growth and development by continuing its source of water and by non-disturbance.

A threatened and endangered vegetation study of the permit area was done the week of August 21, 1995 by Patrick Collins of Mt. Nebo Scientific.



9.4.1.3 Moderately Disturbed Areas

Some of the areas have had considerable disturbance to the vegetation and the top few inches of soil, but have had relatively little deep, subsurface disturbance. These areas are presently dominated by rabbit brush (*Chrysothamnus nauseosus*), Wood's rose (*Rosa woodsii*), stinging nettle (*Urtica dioica*) and other species that can exist on disturbed areas (Appendix 9-1).

9.4.1.4 Severely Disturbed Areas

Other areas seemed to be severely disturbed to deeper levels in the soil horizons. These soils/spoils are often compacted and intermixed with coal waste. Much of this area is dominated by weedy species i.e. summer cypress (*Kochia scoparia*) and ragweed (*Ambrosia psilostachya*). For a list of existing plant species, refer to Appendix 9-1.

9.4.1.5 Results From Disturbed Areas

When the three disturbance types (altered drainage bottoms, moderately disturbed, severely disturbed) were combined, the total living cover was estimated at 48.35%. The cover consisted of 59.37% shrubs, 15.30% forbs and 25.33% grasses (Mt. Nebo Scientific, 1995, Appendix 9-1). A general species list for the 1995 disturbed area study by Mt. Nebo Scientific are listed in Table 9-2.

9.5 Vegetation Patterns Prior to Existing Disturbance

The areas previous disturbed by mining activities and which are proposed for new disturbances, are on valley bottoms and adjacent side slopes. Prior to disturbance, the drainages were probably dominated by a big sagebrush/grass/rabbit brush communities. The sagebrush/grass/rabbit brush communities likely had small, isolated patches of aspen, oak brush, fir and/or maple. Although water fed by springs and run off sometimes dissects the bottom lands, no developed riparian community within the proposed disturbed area existed prior to mining disturbance. However, presently riparian vegetation has established in the area.

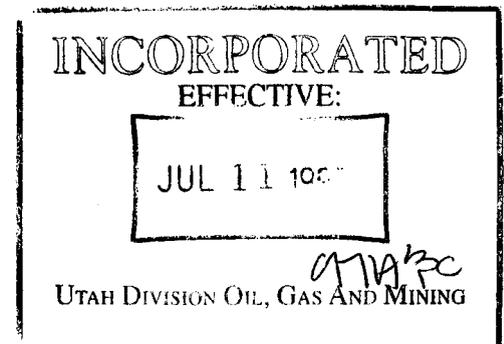
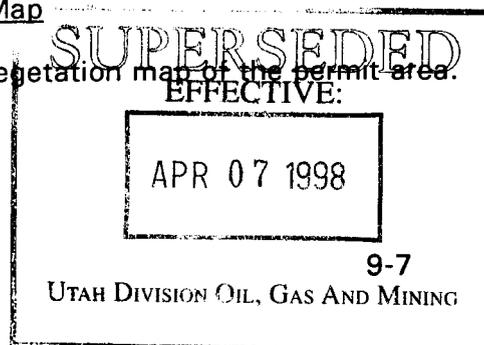
The slopes that surround the valley bottoms are dominated by two major community types in its present natural condition: 1) big sagebrush/grass/rabbit brush (valley bottoms) and 2) oak brush/salina wildrye (side slopes). The Soil Conservation Service (George S. Cook, 1991) estimates that premining forage for the area were 950 lbs per acre for the big sagebrush/grass/rabbit brush community and 900 lbs per acre for the oak brush/salina wildrye communities.

9.6 Reference Areas

If needed and justified, reference areas will be established.

9.7 Vegetation Map

Plate 9-1 is the vegetation map of the permit area.



9.8 Success Monitoring and Bond Release

Transect areas were chosen and approved by the UDOGM to simulated the previously disturbed areas in their natural, undisturbed condition. The transects were sampled during the 1991 growing season by Mt. Nebo Scientific. Sampling methods followed UDOGM sampling guidelines (see Appendix 9-1). For bond release the sampling methods will be identical to those used in the baseline vegetation sampling, i.e. the UDOGM sampling guidelines contained in Appendix 9-1.

During 1995 Mt. Nebo Scientific sampled the Horizon disturbed area, transects were chosen and sampled. The transects are outlined on Plate 9-1. The riparian area along Jewkes Creek was sampled by Mt. Nebo Scientific in July of 1996. The total living cover of the riparian area was estimated by Mt. Nebo to be 71%, therefore postmining land use revegetation standards for the 0.42 acre riparian zone will be met when the vegetation total living cover is 71%, corresponding with the 1996 sampling survey. This living cover will include grasses, forbs and shrubs. The 1996 survey listed the living cover to be comprised of 3.05% shrubs, with 66.19% grasses and the additional 30.76% of the cover being made up of forbs. Sampling and monitoring will be as outlined in this section.

Horizon commits to provide a reclamation channel design which will allow a reasonable likelihood of reestablishing the riparian vegetation along Jewkes Creek which existed prior to the construction of the Horizon No. 1 Mine.

The reclamation ground cover success will be monitored qualitatively every year of the 10 full years required. The ground cover will be monitored quantitatively in year 2, 3, 5, 9, and 10 during the 10 years of extended responsibility (see Table 9-3). The data collected will be submitted to UDOGM in an annual report.

At a minimum the reclamation vegetative ground cover will equal the present ground cover, and will be adequate to control erosion. Revegetative success standard will comply with UDOGM regulation R645-301-356.

Postmining land use revegetation standards will be met when the vegetation total living cover is 48% which corresponds with the 1995 sampling survey performed by Mt. Nebo Scientific. This living cover should include 59% woody species, with the additional 41% of the cover being made up of flora and grasses.

At the time of bond release, shrubs and trees will be healthy, and at a minimum 80 percent will have been in place for at least six growing seasons during the 10 year period of responsibility. Vegetative ground cover will be sufficient to achieve postmining land use and comply with reference area standards of vegetative cover success.

9.9 Threatened and Endangered Species

Table 9-4 contains Federally listed and proposed endangered species in Utah. No threatened or endangered plant species were observed during the study and sampling by Mt. Nebo Scientific in 1995.

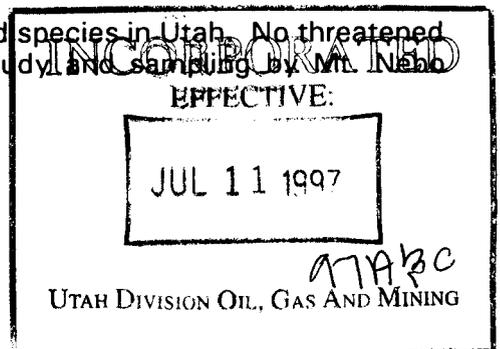
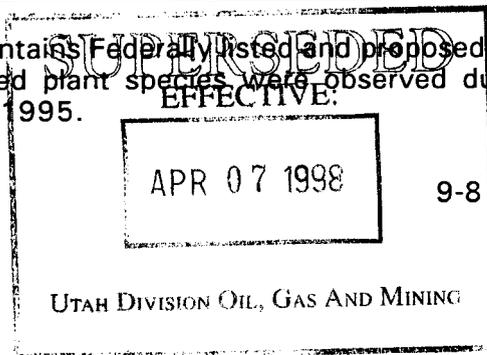


TABLE 9-3
 Reclamation Monitoring Schedule

	YEAR									
	1	2	3	4	5	6	7	8	9	10
QUALITATIVE SAMPLING	X	X	X	X	X	X	X	X	X	X
QUANTITATIVE SAMPLING										
Cover		X	X		X				X	X
Frequency		X	X		X				X	X
Woody Plant Density		X	X		X				X	X
Transplant Survival	X	X	X		X					
Productivity									X	X

SUPERSEDED
 EFFECTIVE:

APR 07 1998

9-9

UTAH DIVISION OIL, GAS AND MINING

TABLE 9-4

Federally Listed and Proposed Endangered Species in Utah
 January 1996

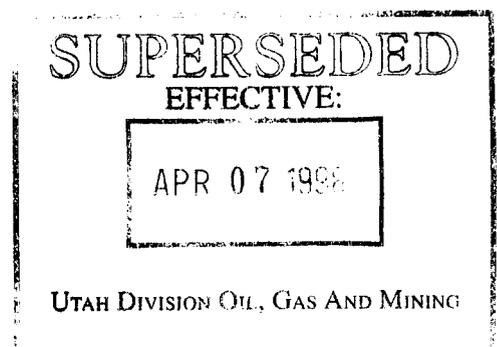
Plants

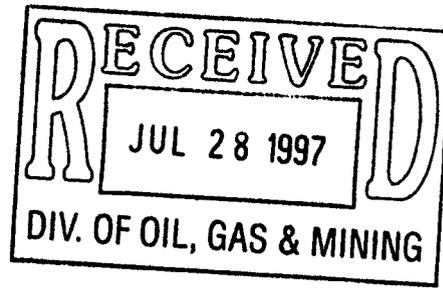
Arizona willow	<u>Salix arizonica</u>	PE
Autumn buttercup	<u>Ranunculus aestivalis</u>	E
Barneby reed-mustard	<u>Schoenocrambe barnebyi</u>	E
Barneby ridge-cress	<u>Lepidium barnebyanum</u>	E
Clay reed-mustard	<u>Schoenocrambe argillacea</u>	T
Clay phacelia	<u>Phacelia argillacea</u>	E
Dwarf bear poppy	<u>Arctomecon humilis</u>	E
Heliotrope milk-vetch ¹	<u>Astragalus montii</u>	T
Jones cycladenia	<u>Cycladenia humilis</u> var. <u>jonesii</u>	T
Kodachrome bladderpod	<u>Lesquerella tumulosa</u>	E
Kodachrome pepper-grass	<u>Lepidium montanum</u> var. <u>stellae</u>	PE
Last chance townsendia	<u>Townsendia aprica</u>	T
Maguire daisy	<u>Erigeron maguirei</u> var. <u>maguirei</u>	E
Maguire daisy	<u>Erigeron maguirei</u>	PT
Maguire primrose	<u>Primula maguirei</u>	T
Navajo sedge ¹	<u>Carex specuicola</u>	T
San Rafael cactus	<u>Pediocactus despainii</u>	E
Shrubby reed-mustard	<u>Schoenocrambe suffrutescens</u>	E
Siler cactus	<u>Pediocactus sileri</u>	T
Uinta Basin hookless cactus	<u>Sclerocactus glaucus</u>	T
Ute Ladies'-tresses	<u>Spiranthes diluvialis</u>	T
Welsh's milkweed ¹	<u>Asclepias welshii</u>	T
Winkler cactus	<u>Pediocactus winkleri</u>	PE
Wright fishhook cactus	<u>Sclerocactus wrightiae</u>	E

¹ Critical habitat designated.

E - Endangered PE - Proposed Endangered T - Threatened PT - Proposed Threatened

For additional information contact: U.S. Fish and Wildlife Service, 145 East 1300 South, Salt Lake City, Utah 84115, Telephone: (801)524-5001





CHAPTER 3
OPERATION AND RECLAMATION PLAN

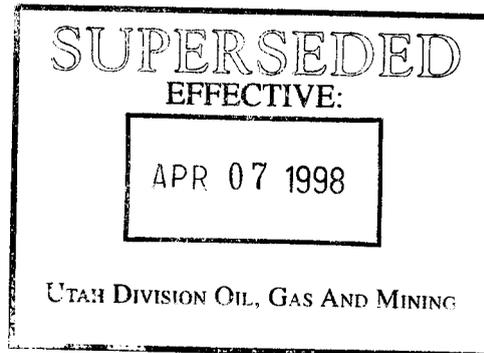


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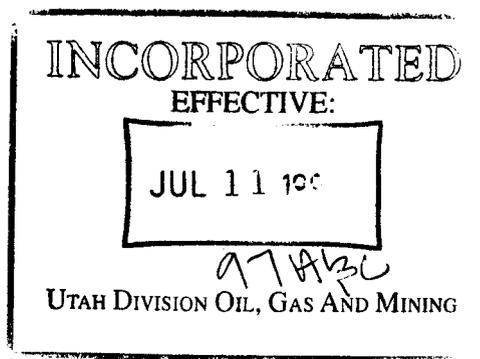
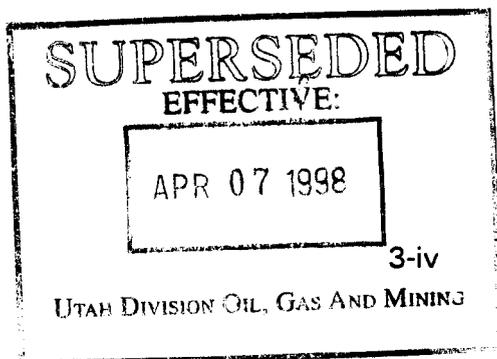


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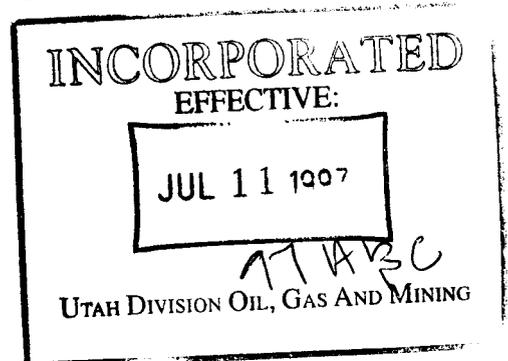
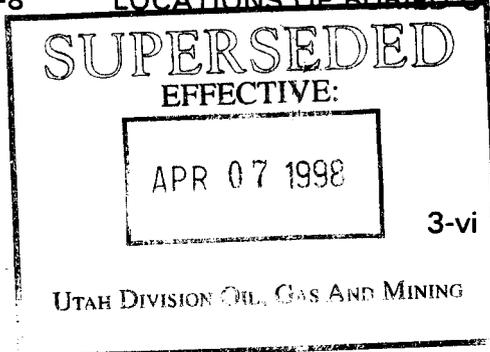
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CHAPTER 3
OPERATION AND RECLAMATION PLAN

3.1 Scope

This chapter outlines the scope of operation and reclamation for the Horizon Coal Corporation No. 1 Mine. The proposed coal mining and reclamation activities will be conducted in compliance with the operation and reclamation plans.

3.2 Surface Facilities Construction Plans

The Horizon No's. 1 surface facilities will be located in Jewkes Creek Canyon and Portal Canyon (see Plates 1-1 and 3-1). All coal and surface is privately owned, except for a proposed right-of-way lease with the U.S. Bureau of Land Management (BLM).

3.2.1 Site Selection and Preparation

The general area in the vicinity of the proposed Horizon No's. 1 Mine has long been used for coal mining. Four underground operations were formerly located on or within a short distance of the permit area. These mines were the Consumers, Sweets, National, and Beaver Creek Mines. Sweets, National, and Consumers were active from the late 1920s to the early 1950s and are presently closed. The Beaver Creek Mine was opened in 1969 and operated originally under the name of the Gordon Creek No. 3 Mine. The mine was purchased by General Exploration Co. in 1973 and then again by Beaver Creek Coal Company in January 1980. The Beaver Creek Mine is presently operated by Mountain Coal Company. Much of the area to be occupied by the surface facilities has been disturbed by previous mining operations, with most of the major disturbances in this area occurring prior to 1950.

Roads and pads that will be constructed in support of the mine will be constructed with a cut and fill technique. Topsoil resources will be conserved as outlined in Chapter 8. The surface facilities will be on privately owned surface.

3.2.2 Mine Portals

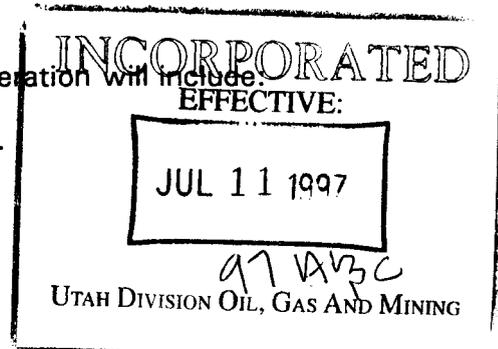
See Section 3.3.1.2 for mine portal descriptions. Portal locations are noted on Plate 3-1.

3.2.3 Surface Buildings and Structures

Locations of proposed surface buildings and structures are shown on Plate 3-1. Upon termination of mining operations, all structures will be removed and the area reclaimed as outlined in Section 3.5.3

Major buildings and structures to be associated with this operation will include:

- (a) Portals - As noted above, see Section 3.3.1.2.



- (b) Fan - An exhaust fan will be used to ventilate the mine.
- (c) Mine Office - A trailer will be located near the portals and used for a mine office.
- (d) Conveyor - A conveyor will bring the coal from the mine. The coal will be discharged into a stockpile.
- (e) Supply Trailers - Two trailers will be located on the portal pad. These trailers will be used as an on-sight warehouse for small items commonly needed in the mine.
- (f) Substation - The substation will be located in the vicinity of the No. 1 Mine portals. The substation will be served and maintained in accordance with MSHA regulations.
- (g) Diversions - Diversions will be located and constructed as outlined in Chapter 7 of this permit application.
- (h) Facility Roads - Primary roads (Upper and Lower Haul Road) will be constructed generally as indicated on Plate 3-4, ancillary roads (Fan Portal Access and Existing Drill) as indicated on Plate 3-4A.

The upper haul road will be crowned. The lower haul road will be sloped inward toward the area designated as the future coal stockpile enabling the runoff to collect and be conveyed to the sediment pond through culvert DC-2. See Plates 7-4 and 7-5 for drainage structures and drainage areas.

In-place surfaces on which these roads are to be constructed will be ripped to a depth of approximately 12 inches and compacted using a sheepsfoot or tampingfoot compactor to 95% of Modified AASHTO density prior to placement of the final course. Newly-placed fill surfaces on which the facility roads are to be constructed will likewise be compacted to 95% of Modified AASHTO density. The final course on primary roads will consist of 12 inches of crushed-gravel roadbase, placed and compacted to 95% of Modified AASHTO density. Drainage ditches to be associated with the facility roads and pads are described in Chapter 7.

The fan-portal access road and existing drill road will have a width sufficient for access by service vehicles and will be cut into native materials. Water-bars will be constructed in each of the ancillary roads, as indicated on Plate 3-4a, in locations indicated on Plate 7-4. Design of these water-bars are discussed in Chapter 7. The fan-portal access road slopes towards the hillside enabling water runoff to collect and be conveyed to DC-2. Water bars have been installed to provide additional drainage control in the area of the fan-portal access road.

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Water collecting on the existing drill road will be conveyed through water-bars to ditch DD-1 then to the sediment pond.

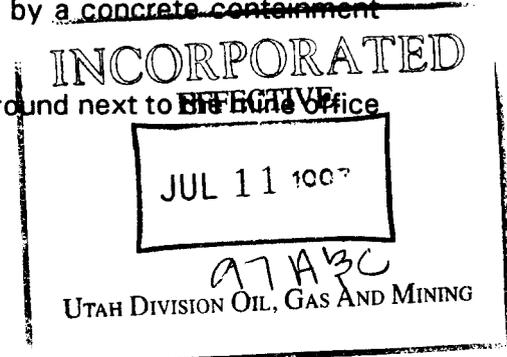
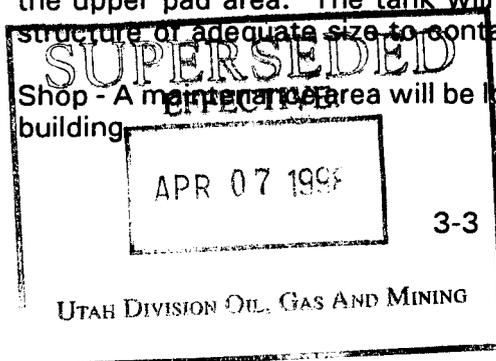
All other areas within the disturbed area are considered pad areas and are not classified as roads.

Coal haulage outside the mine permit area will be provided via Carbon County Road 290 (formerly State Highway 139). The road will be maintained by the Carbon County Road Special Service District (see Appendix 3-1). Carbon County has determined that "the interests of the public and affected landowners will be protected" even though mining and reclamation activities are planned within 100 feet of the road.

From the southern boundary of the permit area, the County Road extends eastward approximately 11.5 miles, ending at U.S. Highway 6 south of Helper. The western 8.5 miles of the County Road between the permit area and U.S. Highway 6 is gravel surfaced, while the eastern 3 miles is paved.

- (i) Water Supply System - Water for non-culinary use will be obtained primarily from springs through leased water rights. A sump or series of sumps will be provided underground to store water during periods of excess availability. Culinary water will be obtained from Price River Water Improvement District, hauled to the site, and stored in an above-ground storage tank. All culinary water facilities will be designed in accordance with applicable Utah Department of Health (UDH) regulations. Plans will be submitted for approval prior to construction.
- (j) Bath Houses - Two trailer-type bath house units will be placed at the mine site. These bathhouses (one for men and one for women) will serve the needs of the miners over the term of this permit. Both bath houses will be equipped with lockers, showers, and lavatories.
- (k) Sedimentation Pond - A sedimentation pond will be located at the downstream edge of the mine yard. Design of this pond is discussed in Chapter 7.
- (l) Sewage System - Chemical toilets will be used during initial development and construction of mine facilities. A service contract will be entered for maintenance of the chemical toilets and disposal of waste therefrom. See Section 3.2.7. for additional discussion.
- (m) Fuel Tank - An above-ground 5,000-gallon diesel fuel tank will be located on the upper pad area. The tank will be surrounded by a concrete containment structure of adequate size to contain any spill.

- (n) Shop - A maintenance area will be located above ground next to the Bufile office building.



- (o) Utilities - Utilities used to provide water to the Horizon No. 1 Mine will be one of the following: water will be trucked to the site from an outside source, or pumped from the North Fork of Gordon Creek or one of its tributaries. Horizon is in the process of determining which of these sources will be utilized and will document the exact source once all rights, permits and permissions have been collected. The utilities are shown on Plates 3-1 and 3-8.

A 4-inch PVC water pipeline runs from the Sweets Canyon Pond to the Horizon No. 1 Mine. The pipeline was constructed along two county roads under a permit issued by Carbon County. Horizon intends to abandon the pipeline from Sweet's Pond to the Horizon permit boundary. Horizon does not intend to utilize this length of pipeline currently, but does not renounce the possibility of future use and commits to contact and gain approval from the governing agencies and provide documentation prior to using this section of pipeline. Soils disturbed by the installation of the water pipeline will be reclaimed according to the requirements of the specific land owner (i.e., Carbon County and Hidden Splendor).

3.2.4 Coal Handling

Coal will be brought out of the mine on a conveyor and discharged onto a storage pile. Coal will be loaded into trucks from the pile using a front-end loader or stacking belt. Temporary storage of excess coal will be provided within the interior of the truck turnaround. Coal from this temporary storage area will be moved using a front-end loader.

3.2.5 Power System

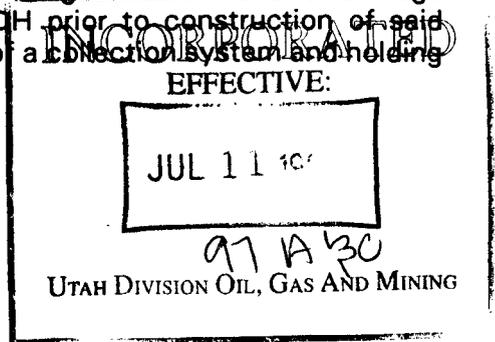
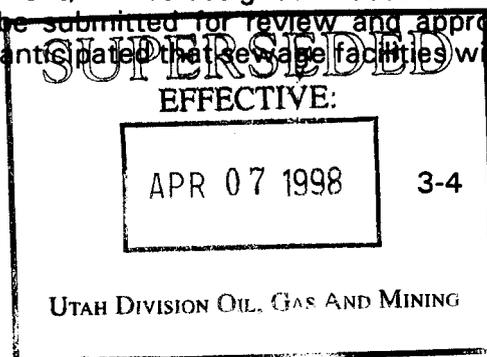
The power obtained from Utah Power and Light Company will reach Portal Canyon substation by way of a transmission line which runs along County Road 290 then along Jewkes Canyon on the east side to the substation. The location of the power line and substation are shown on Plates 3-1 and 3-8. See Chapter 10 for a discussion of raptor safe power lines.

3.2.6 Water Supply

Water for non-culinary use will be stored in a tank/pond within the disturbed area. See Section 3.2.3 for additional discussion.

3.2.7 Sewage System

Chemical toilets will be used during initial development, construction, and operation of the mine. A service contract will be entered for maintenance of the chemical toilets and disposal of waste therefrom. Additional sewage facilities required for normal operation of the mine (after development) will be designed in accordance with UDH regulations. Plans for sewage facilities will be submitted for review and approval by UDH prior to construction of said facilities. It is anticipated that sewage facilities will consist of a collection system and holding tank.



3.2.8 Water Diversion Structures

Diversions will be installed to direct disturbed-area runoff to sediment-control structures and/or facilities. Runoff from undisturbed areas will be diverted away from the disturbed areas to the extent practical. Detailed discussions of the design of diversion structures are provided in Chapter 7.

3.2.9 Sedimentation Control Structures and Water Treatment Facilities

All runoff from the disturbed area is directed into the sedimentation pond located directly below the area of disturbance. The pond has been designed to contain runoff resulting from the 10-year, 24-hour precipitation event. The pond spillway has been designed to safely pass the peak flow resulting from a 25-year, 6-hour precipitation event.

The location of the pond is shown on Plate 3-1. Design, construction, maintenance and operation of the pond are discussed in detail in Section 7.2.3.2.

3.2.10 Transportation, Roads, Parking Area, Railroad Spurs

Coal will be transported from the mine via a conveyor and discharged onto the coal storage area. Coal handling is discussed in Section 3.2.4. Transportation to and from the mine site (coal, personnel, and materials) is discussed below.

Roads

Both primary and ancillary roads will exist within the permit area. Road alignments, widths, gradients, and other design details are shown on Plate 3-4 and 3-4A. A plan view of the roads is shown on Plate 3-1. The roads include primary roads for coal haulage, and ancillary drill and fan portal access roads.

The fan portal access and drill roads are existing roads that will be cleaned and graded to provide vehicle access to the fan for construction and maintenance and access to monitoring well HZ-95-3.

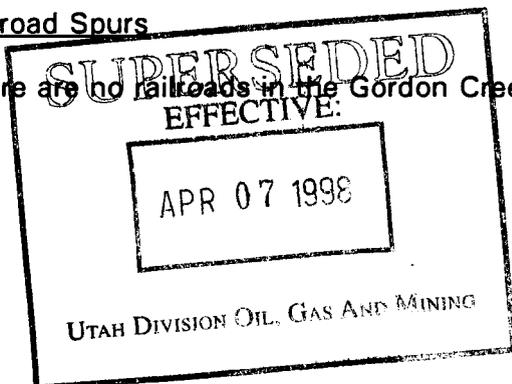
The mine's disturbed area will be accessed by the Consumers/Clear Creek Road, a county owned and maintained road extending from Consumers Canyon to Clear Creek.

Parking Areas

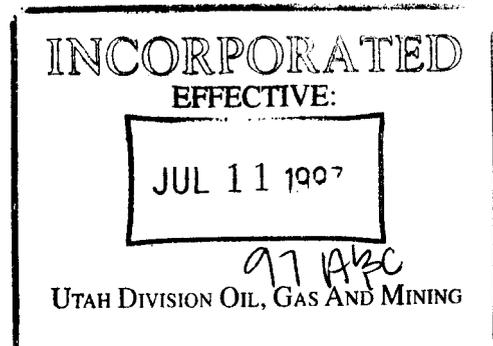
A parking area will be established adjacent to the bathhouse. This area will be graveled and sloped to drain to the sedimentation pond.

Railroad Spurs

There are no railroads in the Gordon Creek area.



3-5



3.2.11 Total Area for Surface Disturbance During Permit Term

See Section 2.11 for the acreage of the proposed surface-disturbance.

3.2.12 Additional Areas for Surface Disturbance for Life of Mine

There are no plans to disturb any additional surface area for the life of the operation beyond that to be initially disturbed.

3.2.13 Detailed Construction Schedule

Much of the area to be included in the surface facilities has been previously disturbed. Construction of the surface facilities is planned to begin when the permit is approved. Details for construction of the sediment pond are found in Chapter 7. A detailed reclamation schedule is presented in Section 3.5.7.

3.3 Operation Plan

In the Horizon No. 1 Mine coal will be extracted using continuous miners, loaded into shuttle cars, and hauled to an underground feeder breaker. The feeder breaker will reduce the coal to an appropriate size, after which the coal will be fed onto a conveyor to be carried to the surface. A crusher on the surface will further reduce the size of the coal, whereupon the coal will be transferred by conveyor to the raw coal storage pile. Coal from the storage pile will be loaded onto coal trucks.

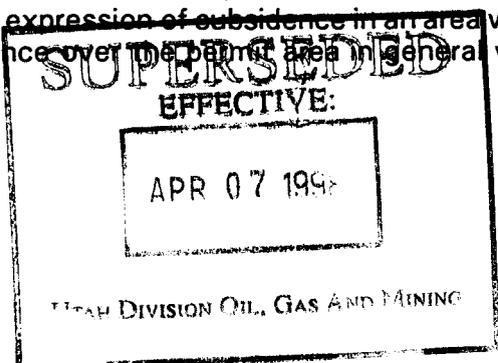
Details of the groundwater monitoring program are presented in Chapter 7.

The coal from the Horizon No. 1 Mine will be sold on a run-of-mine basis, not washed. A minimal amount of rocky or high ash coal is expected to be produced. This material will be shipped to the coal terminal and blended with higher quality coal to be sold.

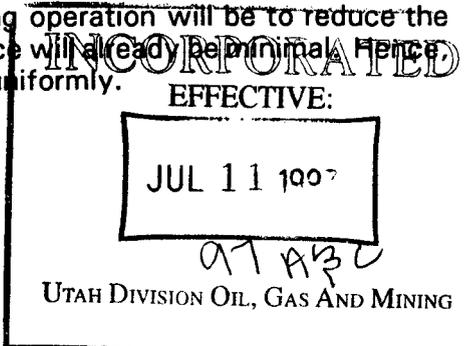
Horizon will gob waste rock in dry underground workings within the permit area when practical. The source of this material will be waste rock resulting from partings and splits in the coal seam.

The waste rock stowed underground will be backfilled into dead-end panels primarily near the outer extent of the area to be mined. Backfilling will occur prior to second mining to ensure that adequate roof support exists in the area. No influence on the active mining operation is anticipated from the backfilling process.

After second mining, this area will subside, causing the waste rock in the mine to compact. Because the waste rock will be emplaced primarily in dead-end panels near the outer extent of the area to be mined, the surface effect of the backfilling operation will be to reduce the surface expression of subsidence in an area where subsidence will already be minimal. Hence subsidence over the permit area in general will still occur uniformly.



3-6



Waste rock will be emplaced using mine haulage equipment. Hydraulic transport media will not be used to emplace the material. As a result, the following factors will not apply to this waste rock:

- o Dewatering of the material;
- o Construction of barriers to retain water underground which might drain from the waste; and
- o Treatment of water from the waste which might be discharge to surface streams.

Thus, no impacts on the hydrologic regime are anticipated due to disposal of the waste rock in the underground workings.

Refuse material will be segregated on the coal stockpile for temporary storage. The maximum quantity of refuse at the mine prior to disposal will be 500 tons. This refuse material will be blended (in small portion) into the coal to be shipped to customers as contract quality specifications allow.

In the unlikely event that underground development waste cannot be blended with the coal and sold or gobbled in the underground mine workings (prior to hauling it to the surface) within the permit area, arrangements, as needed, will be made to dispose of this material in permitted refuse piles at one of the other mines nearby.

Non-coal waste will be temporarily stored in a metal trash receptacle. This dumpster will be unloaded on an as-needed basis by a local contractor and the trash will be hauled to the Carbon County Landfill located northeast of Price. The volume of the waste will be variable. Additional dumpsters will be provided as needed.

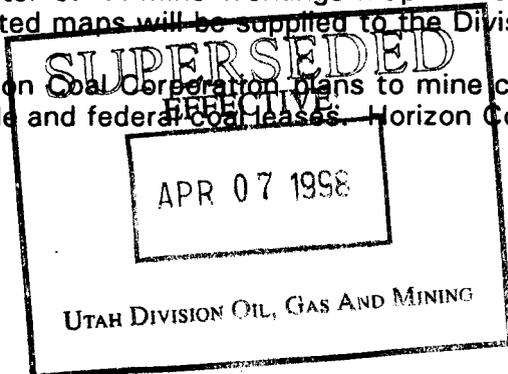
Snow removed will be stored in sites that will drain directly to the sedimentation pond.

3.3.1 Mining Plans

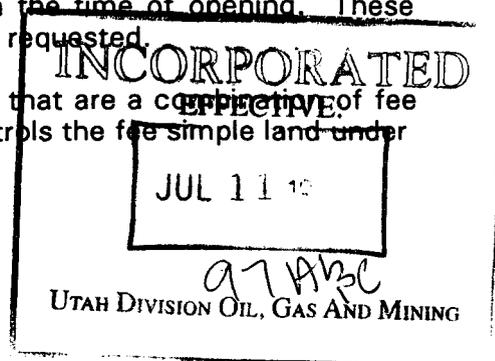
All mining and reclamation operations will be conducted in accordance with the approved permit and the requirements of R645-301-510 through R645-301-553.

Mining plans for the term of the proposed permit are shown on Plate 3-3. This map and Figures 3-1 and 3-2 show the location and extent of known, existing, adjacent workings as well as projections for mining within the Horizon No. 1 Mine. Cross-sections, drill hole elevations, coal seam and overburden stratigraphy, and other geologic data are addressed in Chapter 6. A mine workings map will be kept current from the time of opening. These updated maps will be supplied to the Division yearly or when requested.

Horizon Coal Corporation plans to mine coal from coal lands that are a combination of fee simple and federal coal leases. Horizon Coal Corporation controls the fee simple land under



3-7



a mining lease with Hidden Splendor Resources, Ltd. Two actions have been filed with the U.S. Department of Interior, Bureau of Land Management (BLM) to secure mining rights on federal coal lands within Horizon's projected mine plan. The first action, a BLM right-of-way will enable Horizon to commence mining with approximately 1 year of reserves. The second action, an Application for Coal Lease will enable Horizon to lease coal reserves that will serve for years of mining.

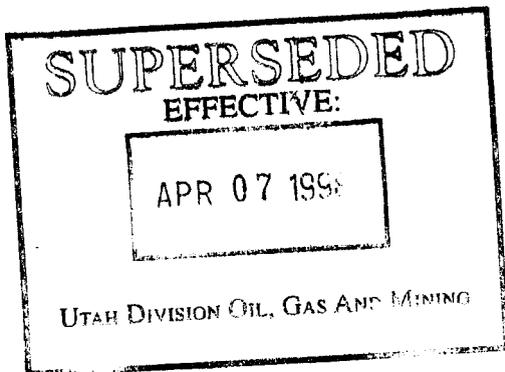
Right-of-Way Application, UPU-73227, Bureau of Land Management

On June 16, 1995 Horizon filed a Right-of-Way application with the BLM. The right-of-way would allow underground access to the segmented fee simple land parcels controlled by Horizon. The BLM was prepared to issue the Right-of-Way on January 22, 1996 when Horizon asked the BLM to hold approval pending an amendment. The amendment filed on January 30, 1996 states "the results of the exploration program conducted by Horizon in the Fall of 1995 under Federal Coal Exploration License UPU-74111 have condemned the economic feasibility of mining the Castlegate seam. However, the exploration confirmed that the Hiawatha coal seam development is a feasible project. The original proposed course of the underground workings portrayed in the application applied to development of the Castlegate seam. The revised application reflects a course for the right-of-way suitable for mining the Hiawatha seam". The lands for the right-of-way are included within the permit boundary of this Mine Permit Application. The BLM issue the Right-of-Way in April of 1996 Appendix 2-3).

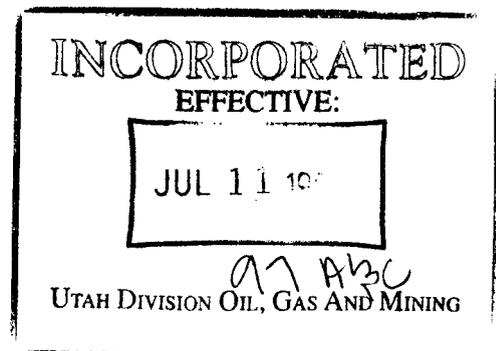
Coal Lease Application UPU-74804, Bureau of Land Management

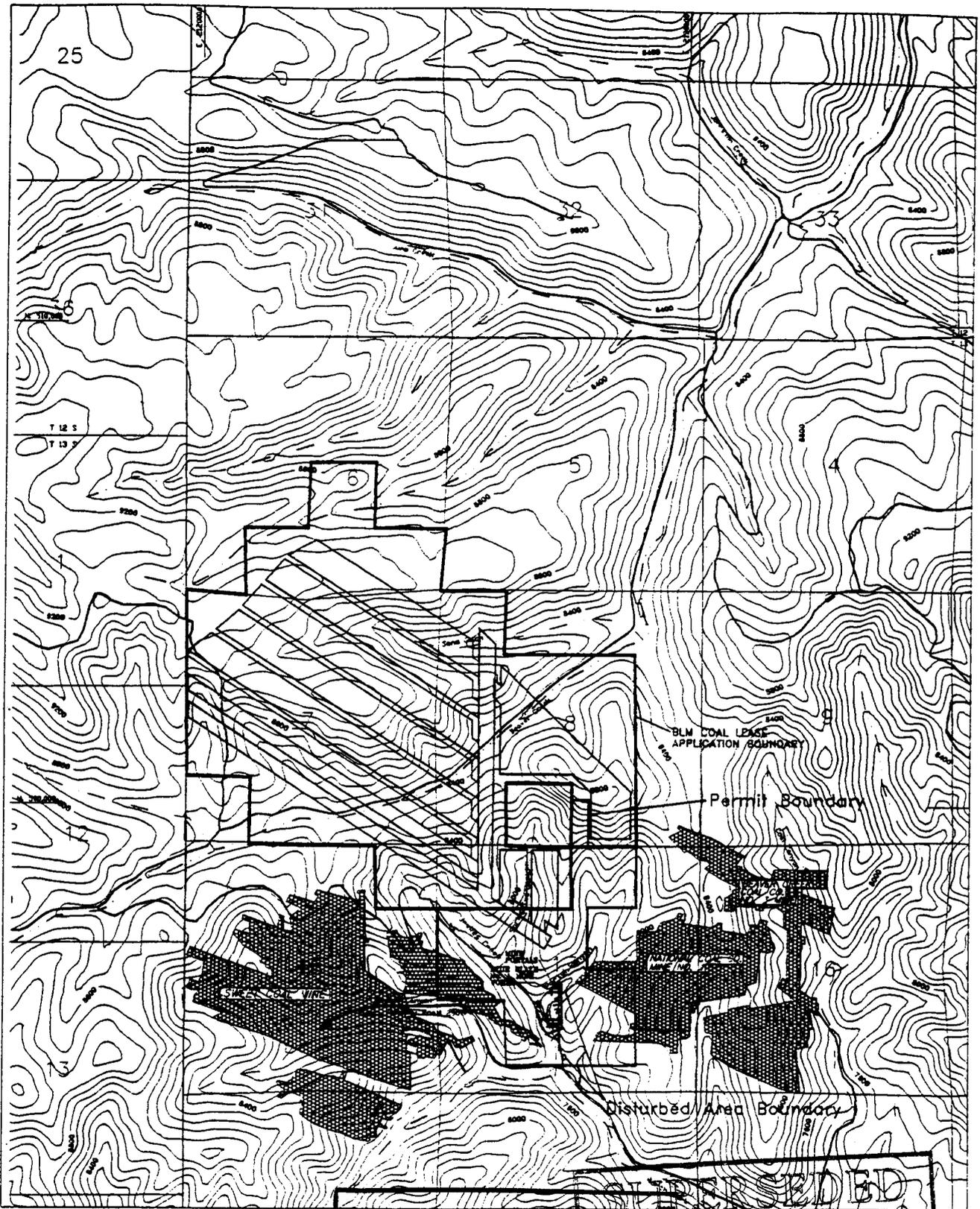
On August 16, 1995, Horizon Coal Corporation filed a Coal Lease Application at the Utah State Office of the Bureau of Land Management. The application for coal lands containing 1,288.49 acres is currently in process. The competitive lease sale is expected in March of 1997. Horizon projects mining on the lands in years 2 through 5 of this Mine Permit Application. Horizon will modify the Mine Permit Boundary to include these lands when Horizon secures the coal lease. These lands are shown on Plate 3-3, as the Coal Lease Application Boundary.

Robert Lopez, Chief, Branch of Mineral Leasing Adjudication, is the contact at BLM, he can be reached at (801) 539-4103.



3-8





LEGEND

-  Previously Mined Areas
-  Improved Gravel Roads
-  Unimproved Roads
-  Jeep Trails
-  Streams

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FIGURE 3-2

OLD WORKINGS
HIAWATHA SEAM

HORIZON No. 1 MINE
MINERAL CORPORATION
P.O. BOX 2580
WISE, VIRGINIA 24273

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UTAH DIVISION OF OIL, GAS AND MINING

BOURQUIN MINERAL ENGINEERING
EARTHFAK ENGINEERING, INC.

3.3.1.1 Orientation and Multiple Seam Considerations

Seam separation in the area ranges from approximately 150 feet to 230 feet. With this distance and land structure indicated by drill logs, it is considered neither necessary nor feasible to columnize these workings.

3.3.1.2 Portals, Shafts, and Slopes

There will be three portals in the Hiawatha seam. The intake portal (existing rock slope) will be rehabilitated and expanded for use as the primary intake and material road. The fan portal (existing rock slope) will be rehabilitated for use as the primary return air course. The fan portal is located at the Castlegate A Seam horizon but connects to the Hiawatha Seam by a steeply inclined rock slope. A third portal will be faced up and a new rock slope (300 feet long) will be driven to the Hiawatha seam. The locations of the portals can be seen on Plate 3-1. The rock excavated from these slopes will be built into the mine yard (approximately 6,000 cubic yards).

3.3.1.3 Mining Methods, Room and Pillar, Longwall

All mining will be done with a continuous miner/shuttle car haulage. In second-mining, a standard room-and-pillar method will be used to maximize coal recovery. Recovery within a room-and-pillar panel is estimated to be about 60 percent. Longwall mining is not planned. Pillar extraction plans are found in Appendix 3-2.

3.3.1.4 Projected Mine Development, Mains, Sub-Mains, Panels, Etc.

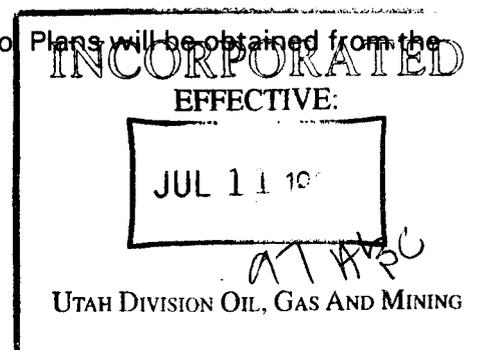
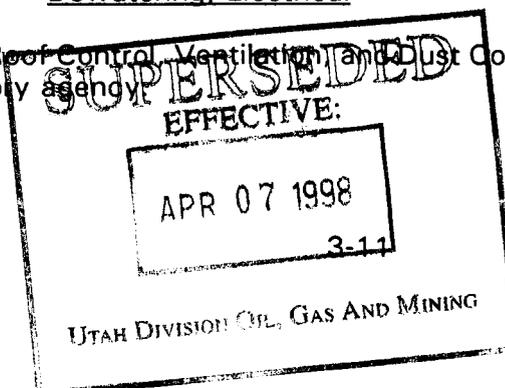
All entries, mains, and panels, will consist of a five-entry system of 70 x 140-ft centers. Room and pillar panels will be driven off the mains. Additional rooms will be driven to widen the panels during retreat mining. Barrier pillars will be left to separate panels and mains. The mains will be pulled upon final retreat of the mining operation. Safety factors for roof conditions using uniaxial compression data are presented in Appendix 3-3.

3.3.1.5 Retreat Mining

Room and pillars are laid out so that pillar cuts can be extracted with a full cut of a continuous miner using radio remote control. The pillar is extracted with successive cuts by the continuous miner. Timbers will be installed to support the roof and provide roof breaker control. It is estimated that mining will provide a recovery rate of 60 percent.

3.3.1.6 Roof Control, Ventilation, Water Systems, Dust Suppression, Dewatering, Electrical

An approval of the Roof Control, Ventilation, and Dust Control Plans will be obtained from the appropriate regulatory agency.



An assessment of groundwater conditions within the No. 1 Mine can be found in Chapter 7. Dewatering plans will be developed should it become necessary.

3.3.2 Barrier Pillars

Protective barrier pillars will be utilized where necessary, normally ranging from 100 feet to 300 feet in width, depending on the depth of cover and the purpose of the barrier. Barrier pillars will be left on either side of the main entries. Barrier pillars in the mains will be extracted on final retreat.

3.3.2.1 Protection of Oil and Gas Wells

There are no oil or gas wells in this area.

3.3.2.2 Protection of Surface Structures and Streams

No surface structures exist within the zone of potential subsidence.

Stream buffer zones (100 feet each side of creek) will be maintained beneath Beaver Creek and the North Fork of Gordon Creek should mining proceed beneath either creek. Second mining will not be practiced within these buffer zones or under raptor nests without regulatory agency permission.

3.3.2.3 Property Boundaries

A protective barrier pillar with a width of approximately 80 to 100 feet will be left at all property boundaries.

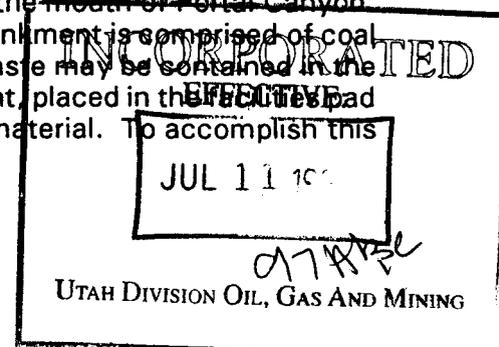
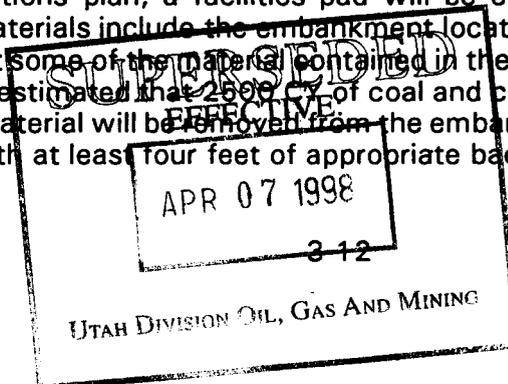
3.3.2.4 Outcrop Protection

A protective barrier pillar with a width of approximately 100 feet will be left when advancing toward or along an outcrop.

3.3.2.5 Other

At any time a land slide occurs which may have an adverse effect on public property, health, safety, or the environment, the Division will be notified by the fastest available means. Horizon Coal Corporation commits to complying with remedial measures required by the Division.

As part of the operations plan, a facilities pad will be constructed from available on-site materials. On-site materials include the embankment located at the mouth of Portal Canyon. Test pits indicate that some of the material contained in the embankment is comprised of coal and coal waste. It is estimated that 2500 CY of coal and coal waste may be contained in the embankment. This material will be removed from the embankment, placed in the facilities pad area, and covered with at least four feet of appropriate backfill material. To accomplish this



task, the pad area will first be stripped of vegetation and topsoil as described in Section 8.7. The appropriate cuts of overburden will be made to achieve the rough grade. The coal and coal waste will then be placed in the fill areas and covered with four feet of backfill.

A potential storage volume of approximately 2740 for the coal and coal waste was calculated from the cross-sections illustrated on Plates 3-1 and 3-2. Appendix 3-8 contains a plate showing approximate locations of buried coal waste.

The Portal Canyon facilities pad will be built with 4 feet of acceptable backfill covering any coal or coal waste materials. No coal or coal waste will be used as fill in the areas planned for the reclamation stream channels in Portal or Jewkes Canyon.

3.3.2.6 Underground Development Waste

See Section 3.3.

3.3.2.7 Return of Coal Processing Waste to Underground

There is no plan to return coal processing waste to the underground.

3.3.3 Conservation of Coal Resource

The maximum quantity of coal will be extracted that is consistent with safe operation of the mine and the mining methods to be employed. Engineering, production, and supervision of mining activities will be geared toward this end. If plans for resource recovery or abandonment (including portal sealing) change in the future, the U.S. Bureau of Land Management and the Division will be properly informed.

3.3.3.1 Projected Maximum Recovery

Coal reserves within the permit area are summarized below. Recoverable reserves were estimated using a recovery rate of 60 percent.

Area	Hiawatha Seam (million tons)	
	Total	Recoverable
Permit Boundary	1.3	0.8
Coal Lease Application	12.7	7.6
Total	14.0	8.4

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3.3.3.2 Justification for Non-recovery

All coal that can economically and safely be recovered will be recovered. Barrier pillars and buffer zones will be left only where required to protect surface resources, provide safe mining conditions, and as required by law or regulation.

3.3.3.3 Access for Future Reserves

Access to additional reserves will depend upon the results of exploration activities and obtaining of leases. However, it is currently anticipated that the mine workings contemplated by this plan will provide access to reserves in Sections 6, 7, 8, and 18, T13S R8E.

3.3.4 Equipment Selection

Major equipment to be used underground will include the following:

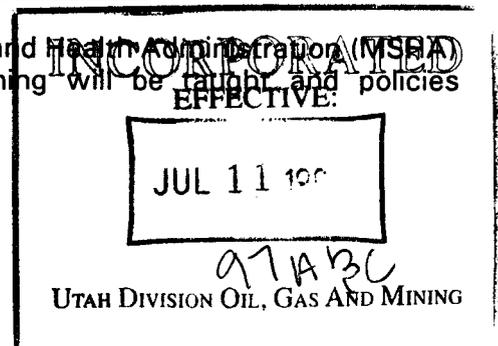
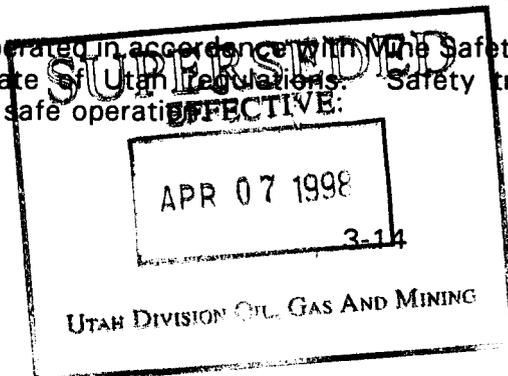
- 1 - Joy 12CM-11 Continuous Miner
- 1 - Lee Noris Roof Bolter RD1-43
- 2 - Joy Shuttle Cars
- 1 - Long Airdox Rosco II Feeder Breaker
- 1 - Wagner Scoop
- 1 - Joy Air Compressor
- 1 - MSA Rock Duster
- 1 - Calhune Rock Duster
- 2 - Long Airdox Conveyor Drives & Tail Pieces 42"
- 1 - John Deer Dust Wagon
- 1 - Power Center
- 3 - Transformers
- 2 - Pumps
- 1 - Substation

Major equipment to be used on the surface will include the following:

- 1 - 992 Cat Loader
- 1 - Material tractor
- 1 - Lincoln Welder
- 3 - Flatbed Material Trailers
- 1 - Storage Van
- 2 - Bathhouses

3.3.5 Mine Safety, Fire Protection, and Security Mine Safety

The mine will be operated in accordance with Mine Safety and Health Administration (MSHA) and applicable State of Utah Regulations. Safety training will be taught, and policies implemented for a safe operation.



Fire Protection

All surface and underground equipment will be provided with MSHA-required fire protection. In addition, belt drives will be equipped with deluge systems for fire protection. Water lines will also be equipped with outlets and fire hoses at regular intervals. Should a mine waste fire occur, it will be extinguished using water, extinguishers, rock dust, foam, or by sealing off the fire. Mine personnel will be trained in the use of fire-fighting techniques.

There will be no open burning on the surface. All garbage will be contained in dumpsters and hauled to the Carbon County Landfill. If flammable waste materials (oil, etc.) are generated, these will be disposed of in accordance with regulations promulgated by the Utah Division of Solid and Hazardous Waste. Disposal methods and locations will be determined based on the characteristics of the flammable waste.

Impoundment Hazards

Impoundment hazards will be reported promptly to the Division and the emergency procedures formulated for public protection and remedial action.

Security

Mine portals will be signed and covered by locked gates when the mine is in cessation.

3.3.5.1 Signs

Specifications

All signs will be of a standard design that can be seen and read easily. They will be made of a durable material (treated/painted wood or metal) and supported by metal or wooden posts.

Identification Signs

Mine identification signs will be placed at the entrance to the mine yard. Signs will show the mine name, company name, business address, telephone number, ID Number, and Permit Number. These signs will be maintained until bond release following reclamation. Typical mine identification signs are presented as Figures 3-3 And 3-4.

Disturbed Area Perimeter and Buffer Zone Markers

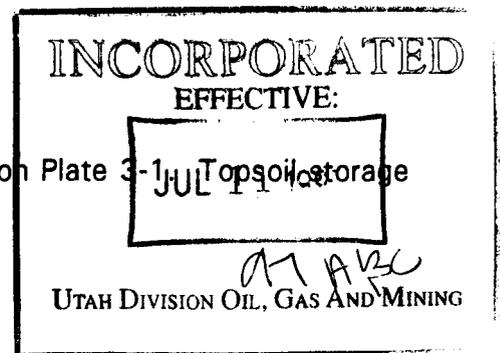
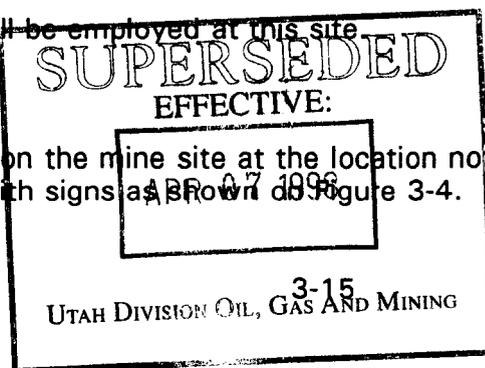
Disturbed area perimeter markers will be steel fence posts. The posts will carry signs at selected points, with the designation "Disturbed Area Perimeter Marker" (see Figure 3-4).

Blasting Signs

No surface blasting will be employed at this site

Topsoil Markers

Topsoil will be stored on the mine site at the location noted on Plate 3-1. Topsoil storage piles will be marked with signs as shown in Figure 3-4.



3.3.5.2 Fences and Gates

Mine portals will be signed and covered by locked gates when the mine is in cessation.

3.3.5.3 Fire Protection

Facilities

All facilities will be equipped with fire extinguishers. Water outlets and fire hoses will be available at specific locations.

Coal Stockpiles

The coal stockpile will be temporary and will be loaded out at frequent intervals, thus reducing the potential for spontaneous combustion.

Coal Seam

No open burning will be allowed at the mine. All coal outcrops resulting from mining will be covered with incombustible material upon cessation of operations, as discussed in Section 3.5.

3.3.5.4 Explosives

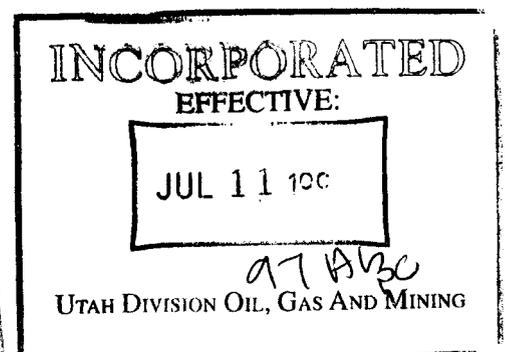
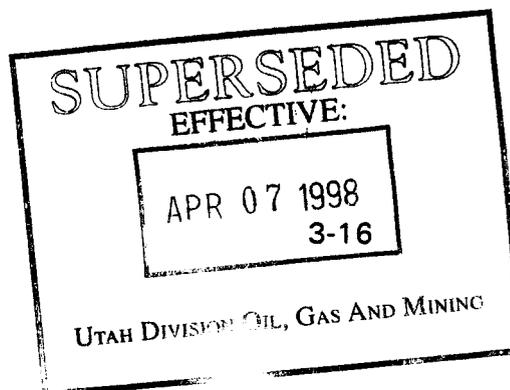
Any explosives utilized in underground operations will be used in compliance with applicable State and Federal laws. Explosives will be handled and used only by persons trained, examined, and certified as required by 30 CFR 850 and the Utah State Industrial Commission. Explosives will be stored in a facility designed for their containment and safety.

3.3.5.5 Management of Mine Openings

Three portals will serve the Hiawatha seam. Two portals exist from previous mining. A third rock slope will be driven to open the new mine. For each of these portals the faceup will be secured and canopies will be installed to meet MSHA standards.

During operation of the Horizon Mine, access to all mine openings are controlled by the operator during working and nonworking hours. Due to public access through the mine site, gates across the mine openings will be closed and locked when no employees are present.

Permanent sealing of underground openings is discussed in Section 3.5.3.1.



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HORIZON COAL CORPORATION
P.O. BOX 2560
WISE, VA 24293
(703) 472-3786
PERMIT NO.

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HORIZON MINE
STREAM BUFFER ZONE

18" X 12"

HORIZON MINE
BUFFER ZONE
DO NOT DISTURB

18" X 12"

HORIZON MINE
TOPSOIL STORAGE
DO NOT DISTURB

18" X 12"

HORIZON MINE
DISTURBED AREA
PERIMETER
MARKER

8" X 12"

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FIGURE 3-4 IDENTIFICATION SIGNS.
3-18
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3.3.6 Operations Schedule

3.3.6.1 Annual Production Per Year for Permit Term

Coal will be produced from the mine at an anticipated rate of approximately 700,000 tons per year. The production could increase to 1.5 million tons per year when federal coal leases are secured and if the market dictates.

3.3.6.2 Operations Schedule - Days - Shifts

Production will occur in shift/shifts, five days per week (approximately 240 days per year). A small crew will perform maintenance work and other non-production jobs.

3.3.6.3 Operation Employment

It is currently anticipated that the Horizon Mine will employ approximately 7 salaried and 31 hourly people.

3.3.6.4 Temporary Cessation

If operations are to be temporarily ceased for more than 30 days, Horizon will submit to the Division a notice of intention to cease or abandon the operations. In accordance with R645-301-529.210, each mine entry that has further projected useful service will be protected by barricades or other covering devices, fenced, and posted with signs to prevent access into the entry and to identify the hazardous nature of the opening. These devices will be periodically inspected and maintained by Horizon.

3.3.7 Mine Permit Area

3.3.7.1 Acreage and Delineation of Mine Permit Area

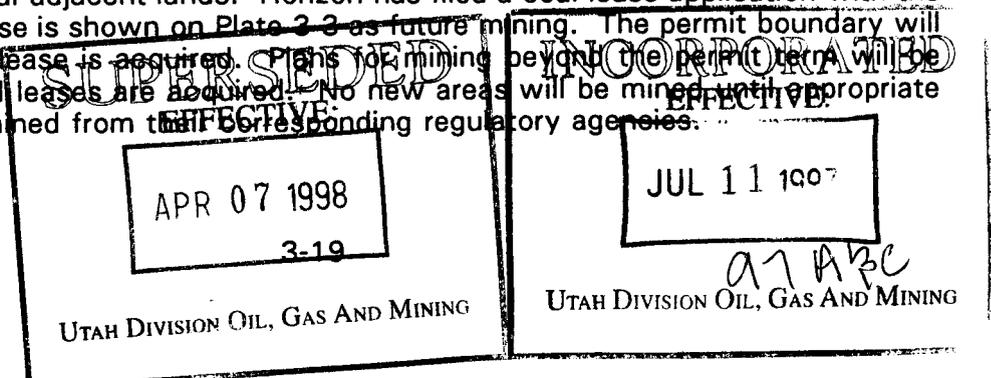
See Chapter 2 for the total acreage contained within the mine permit boundary.

3.3.7.2 Projected Mining by Year

The projected mining by year is shown on Plate 3-3.

3.3.8 Mine Plan Area

Horizon plans to mine within the mine permit boundary as shown on Plate 1-1 until it obtains coal leases for additional adjacent lands. Horizon has filed a coal lease application with the BLM. The potential lease is shown on Plate 2-3 as future mining. The permit boundary will be modified when the lease is acquired. Plans for mining beyond the permit term will be developed as additional leases are acquired. No new areas will be mined until appropriate permits have been obtained from the corresponding regulatory agencies.



3.4 Environmental Protection

3.4.1 Preservation of Land Use

Upon completion of mining operations, final reclamation work will commence. Reclamation efforts will be directed to recreating the pre-mining land use. This will be achieved by use of acceptable seed mixtures. Refer to Chapter 4 for pre-mining land use information.

3.4.1.1 Projected Impacts of Mining on Current and Future Land-Use

Current and future land uses are discussed in Sections 4.4 and 4.5.

3.4.1.2 Control Measures to Mitigate Impacts

Second mining will not occur beneath the stream channels and raptor nests indicated on Plates 3-3 and 10-1 respectively. Based on the boundaries of the present surface disturbance, no public parks or historic sites will be impacted by mining operations. A further discussion of Cultural Resources may be found in Chapter 5.

3.4.2 Protection of Human Values

3.4.2.1 Projected Impacts of Mining on Human Values

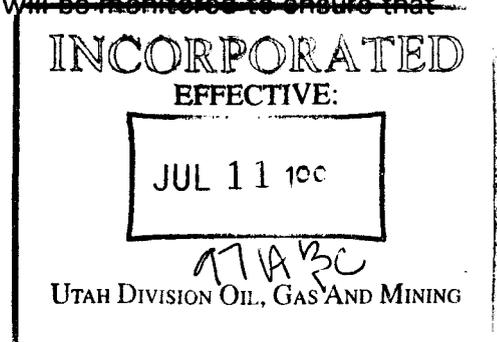
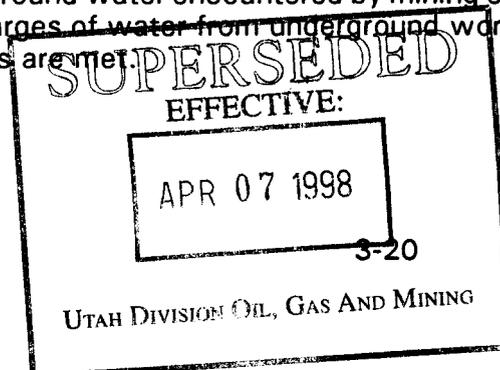
As discussed in Chapter 5, no historical sites listed on the National Register of Historical Places are known to exist within the proposed disturbed areas. In addition, no known archaeological sites exist within the proposed disturbed area.

3.4.3 Protection of Hydrologic Balance

Horizon will employ various control measures to protect the hydrologic balance of the permit area and sedimentation controls will be provided for all disturbed areas.

Water rights on file with the Utah Division of Water Rights and located in the vicinity of the permit area are noted in Appendix 3-5. Should Horizon's mining activities cause an adverse impact on the area's water supply, the applicant intends to mitigate the effects (see Sections 3.4.8.2 and 7.1.6).

Diversions will be established to direct flow from disturbed areas to the sedimentation pond. If water is encountered during mining operations, this water will be used for underground operations. An UPDES permit has been obtained for the mine (see Appendix 3-6). If the quantity of underground water encountered by mining exceeds the amount required for mining operations, discharges of water from underground workings will be monitored to ensure that effluent limitations are met.



3.4.3.1 Projected Impacts of Mining on Hydrologic Balance

The probable impacts of mining on surface or groundwater resources in the area are discussed in Chapter 7. Runoff and sediment-control facilities within the disturbed area, together with coal buffer zones beneath Beaver Creek and North Fork of Gordon Creek, will preclude significant impacts to surface water in the area. Groundwater investigation and monitoring activities associated with the Hiawatha seam and its adjacent strata will continue, thus allowing a determination of the potential groundwater impacts of mining in the Hiawatha seam. A subsidence monitoring program (see Section 3.4.8) will provide a basis for determining possible impacts due to subsidence.

3.4.3.2 Control Measures to Mitigate Impacts and Monitoring Procedures

Horizon Coal Corporation will maintain sedimentation control structures to prevent impacts to the surface waters in Jewkes Creek and the North Fork of Gordon Creek. Groundwater that may be encountered during mining operations will be used underground. In the event that the quantity of groundwater encountered during mining is in excess of underground requirements, the water will be settled first in underground sumps and then discharged to the surface. Any such discharges will be monitored in accordance with the UPDES permit.

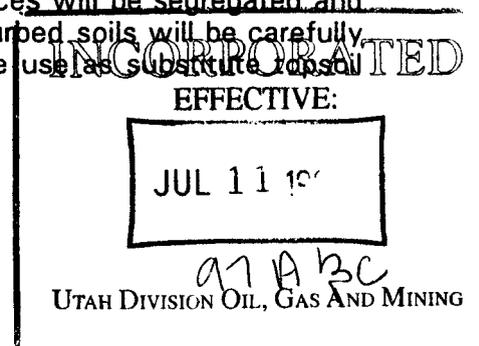
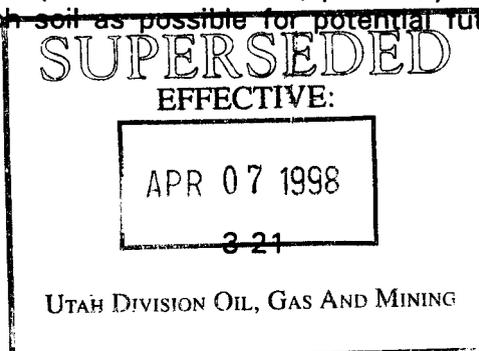
Surface and groundwater monitoring programs have been or will be implemented to assess the impacts of mining operations at the No. 1 Mine on hydrologic resources in the area. Details of these monitoring programs are presented in Chapter 7.

3.4.4 Preservation of Soil Resources and Projected Impacts of Mining on Soil Resources

Soil resource information for the mine area is presented in Chapter 8. Soil surveys were performed in the area in May 1980 and in January 1990. Naturally-occurring and presently-disturbed soils were delineated. The purposes of the surveys were to identify soils and their stripping depths for salvaging suitable natural soil prior to additional disturbance and to determine the amount of topsoil available for final reclamation.

Most of the existing disturbance at the mine occurred prior to enactment of P. L. 95-87 or the Utah Interim Program that set forth regulations for salvaging topsoil (i.e., pre-1950's disturbance). However, some topsoil exists along the shoulders of cut areas where it was not disturbed during previous construction activities.

During construction of surface facilities, available topsoil resources will be segregated and stockpiled as indicated in Chapter 8. In addition, presently-disturbed soils will be carefully handled to salvage as much soil as possible for potential future use as substitute topsoil materials.



3.4.4.1 Control Measures to Mitigate Impacts to Soil Resources

Surface disturbances will be limited to the disturbed area boundary noted on Plate 1-1. Topsoil that is stockpiled for future reclamation efforts will be vegetated with an interim cover to reduce erosion of the stockpile. All areas disturbed during mining activities will be reclaimed in accordance with the approved reclamation plan (see Section 3.5).

3.4.5 Protection of Vegetative Resources

3.4.5.1 Projected Impact of Mining on Vegetative Resources

Previous mining activities have resulted in alteration of natural vegetation at the site area. The majority of this area has been disturbed previously by mining operations.

3.4.5.2 Mitigation Measures to be Employed to Reduce Impacts on Vegetative Resources

All mining activities will be conducted within the proposed disturbed area. Traffic will be confined to established roadways and pads. Upon completion of mining, all areas which are disturbed by Horizon Coal Corporation will be reclaimed as described in Section 3.5.3.

3.4.5.3 Monitoring Procedures - Reference Areas and Revegetation

Sections 3.5.5, 3.5.6 and 9.8 discuss the monitoring procedures and revegetation to be undertaken during mining and reclamation operations.

3.4.6 Protection of Fish and Wildlife

3.4.6.1 Potential Impacts on Fish and Wildlife

Potential impacts on fish and wildlife are discussed in Section 10.4.

3.4.6.2 Mitigation and Management Plans

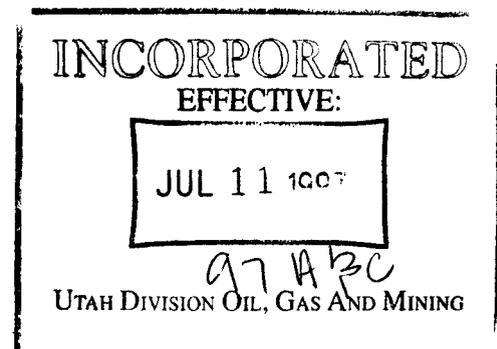
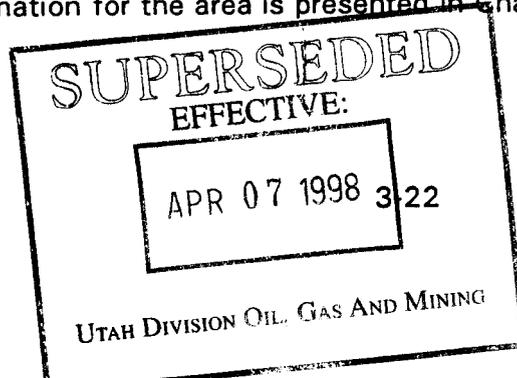
Refer to Section 10.5 for mitigation and management plans.

3.4.6.3 Fish and Wildlife Monitoring

Monitoring is discussed in Section 10.5.

3.4.7 Protection of Air Quality

Air quality information for the area is presented in Chapter 11.



3.4.8 Subsidence Control and Monitoring Plan

3.4.8.1 Structures

A search of the site files at the Utah Division of State History turned up no recorded sites in, or near, the project area. Since the identified sites are abandoned homestead cabins or mining camp dwellings and are not recorded as warranting preservation efforts, no special mining techniques are deemed necessary for their protection. The archaeological survey is described in detail under Chapter 5 of this plan.

At least 6 months prior to mining beneath an area, Horizon will notify all owners of overlying surface property (see Section 4.3.1).

3.4.8.2 Renewable Resources

Hydrologic and vegetative renewable resources exist within the permit area. One perennial stream, Beaver Creek, and various springs are known to exist above the area to be mined. Based on past experience and monitoring results from this area, it is not expected that mining will affect any hydrologic resource through subsidence.

Significant inflows of groundwater to underground workings are not currently anticipated. However, should a substantial inflow of groundwater occur, mitigation measures may include: attempts to seal off the inflow, increased monitoring efforts, lining of the stream bed through the affected area, and replacement of lost water if indicated by monitoring.

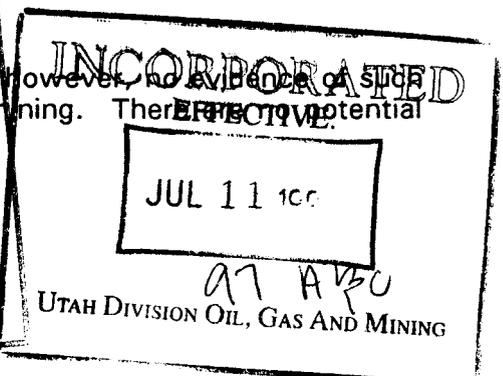
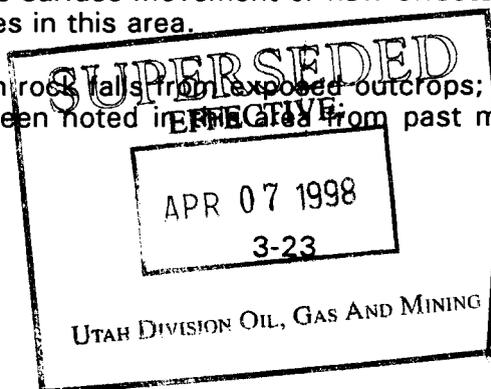
An extended mitigation plan will be enacted should a measurable impact occur to surface water due to mining activity. The mitigation plan will be correlated with Water Rights and UDOGM.

The vegetation resource above the mining area consists of rangeland for stock and wildlife grazing and a limited timber resource. If subsidence should occur, the effects would be minimal, possibly resulting in some fractures or slight depressions. Thus, the effect upon vegetation resource would also be minimal. Should impacts to vegetation occur due to subsidence, mitigation measures may include: filling of fractures, regrading of broken areas, replanting degraded areas, and intensified monitoring.

3.4.8.3 Geologic Hazards

Geologic hazards in the mine area exist in the form of steep slopes and numerous inactive normal faults. Roof conditions will typically worsen in these areas due to fracturing and slickensides; however, no surface movement or new effects have been noted to date from mining through fault zones in this area.

Movement could result in rock falls from exposed outcrops; however, no evidence of such falls or movement has been noted in the area from past mining. There is potential



landslide or slump areas known to exist that were caused by previous mining activities in the area.

3.4.8.4 Subsidence

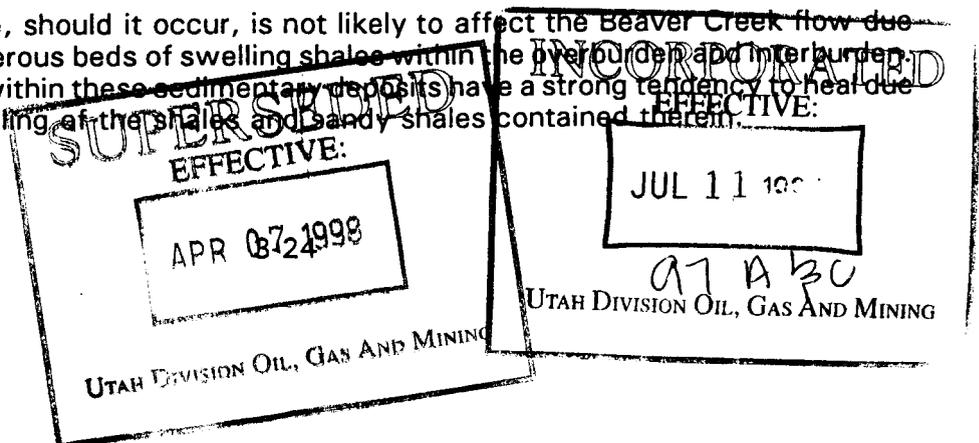
Subsidence can normally be expected to occur over areas where second mining (pillaring) has taken place. Maximum potential subsidence from pillar extraction in the No. 1 Mine (the Hiawatha seam) has been estimated from Figure 3-5 using the following criteria:

Panel Width = 600 ft
Average Depth = 800 ft
Width/Depth Ratio = 0.75
Seam Thickness = 7.0 ft

Using these data, subsidence due to pillar extraction in the Hiawatha seam could reach 2.33 feet directly over a pillared panel. The cumulative potential subsidence for areas where both seams are pillared is 6.18 feet (3.85 + 2.33). Again, past experience in this area suggests that subsidence would be of a lesser magnitude.

The following observations and conclusions regarding subsidence have been made from past mining activities in the vicinity of the proposed mine:

- (1) Pillaring in the upper (Castlegate "A") seam has previously occurred place beneath Beaver Creek. Specifically, the northernmost west panel was pillared beneath Beaver Creek by Swisher Coal Company in January 1978 in an areas where the overburden thickness was about 650 feet. In addition, in September 1981, Beaver Creek Coal Company pillared the "A" Panel area beneath Beaver Creek in an area with an overburden thickness of approximately 425 feet. Neither of these areas show any measurable effect on Beaver Creek.
- (2) The Gordon Creek No. 2 Mine overlies areas pillared up to 40 years ago in the lower seam (Sweet's Mine) with no noticeable subsidence effects. The Consumers No. 3 Mine also pillared areas in the permit area which show no noticeable subsidence effects.
- (3) The overburden in the permit area above the Castlegate "A" seam (with a thickness of 600 to 800 feet) contains massive sandstone units which are unlikely to allow caving effects to reach the surface. In addition, the seams are separated by over 150 feet of similar interburden with no noticeable effects from past pillaring.
- (4) Subsidence, should it occur, is not likely to affect the Beaver Creek flow due to the numerous beds of swelling shales within the upper seam and interburden. Fractures within these sedimentary deposits have a strong tendency to heal due to the swelling of the shales and sandy shales contained therein.



Refer to Sections 3.4.8.2 and 7.1.6 for a discussion of water resource mitigation measures.

3.4.8.5 Subsidence Control and Monitoring Plan

The subsidence monitoring network will consist of permanent survey monuments located outside of the anticipated area of subsidence and a series of monitoring stations within the potential subsidence zone (Plate 3-5). The monitoring stations will be steel re-bar with aluminum caps set so that weather, frost heave, or livestock will not disturb them. Stations will be installed above the active mining area.

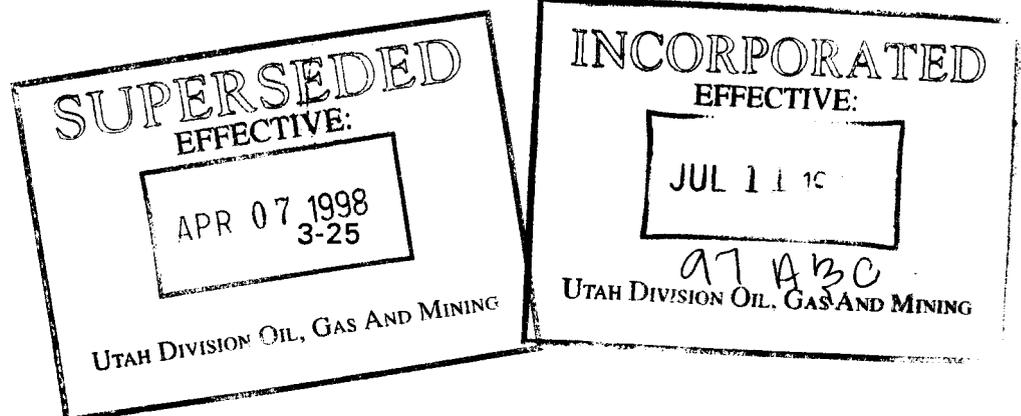
Multiple readings will be taken where necessary to ensure accuracy. Monitoring of the subsidence stations noted on Plate 3-5 will be performed on an annual basis for a period of two years following final cessation of mining operations. Reports of monitoring will be sent to the UDOGM on a yearly basis.

The extent of the adjacent area outside of the permit area was determined based on a maximum overburden thickness of 1500 feet (from data presented by Hansen, 1988) and an angle of draw of 35 degrees as measured from the vertical (the maximum angle of draw recommended by Dunrud [1976]). This angle of draw is significantly in excess of the 20-degree value used by Beaver Creek Coal Company for adjacent mining operations (Guy, 1985), but will result in a conservative estimate of the extent of the adjacent area. Based on the 35-degree angle of draw and a maximum overburden thickness of 1500 feet, subsidence impacts will extend a maximum of 1050 feet (0.2 mile) from the edge of the permit area. Hence, for the purpose of this application, the adjacent area for potential subsidence is defined as that area within 0.2 mile of the permit area.

3.5 Reclamation Plan

3.5.1 Contemporaneous Reclamation

Disturbed area's when no longer needed, will be backfilled, graded, retopsoiled, and revegetated. Seeding, fertilizing, and mulching will be performed as soon as practical following redistribution of topsoil. Seed Mix #2 presented in Table 3-3 will be planted, and erosion-control matting will be installed in specific areas as described in Section 3.5.5.3. Reclamation techniques are described below. Seed Mix #1 will be used in areas requiring soil stabilization during the operational period of mining. These areas will likely be redisturbed either during the operation or reclamation of the mine site.



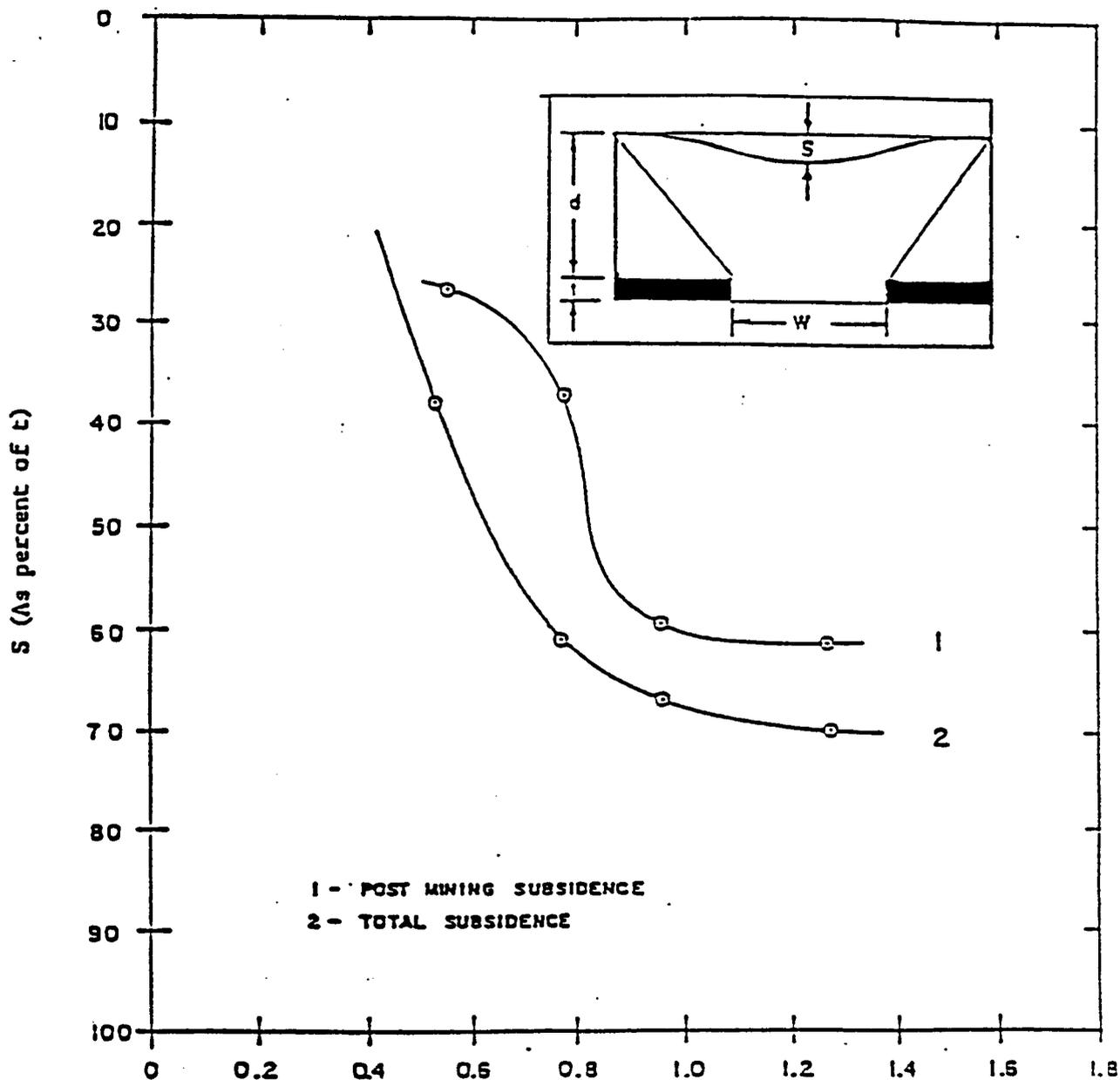


FIGURE 3-5. SUBSIDENCE/SEAM THICKNESS RATIOS (from Dunrud, 1980)

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3.5.2 Soil Removal and Storage

Soil surveys conducted at the mine site have distinguished disturbed lands from undisturbed soil mapping units (see Chapter 8, Plate 8-1). Areas mapped as disturbed land are areas where the soils, vegetation, or both were affected by previous mining operations. Disturbance of the roads and pads occurred prior to regulatory requirements to salvage topsoil from those areas.

All topsoil/growth medium to be generated during future disturbances will be stockpiled. The stockpiles will be contoured, fertilized, vegetated with Seed Mix #1 outlined in Section 3.5.5.2, and mulched as outlined in Section 3.5.5.3. Markers will be placed indicating that the piles contain topsoil. Berms will be placed around the stockpile to minimize off-pile transport of sediment.

Refer to Section 8.8 for the methods being used in the redistribution of soils.

3.5.3 Final Abandonment

Upon permanent cessation of operations, permanent reclamation will be performed. All surface equipment, structures and facilities (other than sedimentation control) associated with the operation will be removed during reclamation of the affected area.

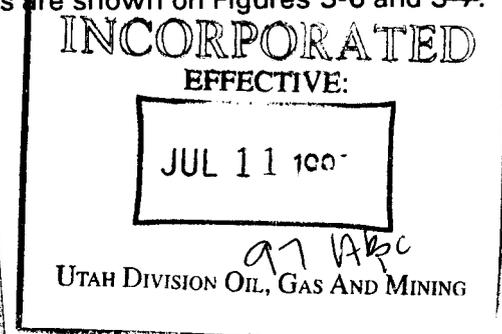
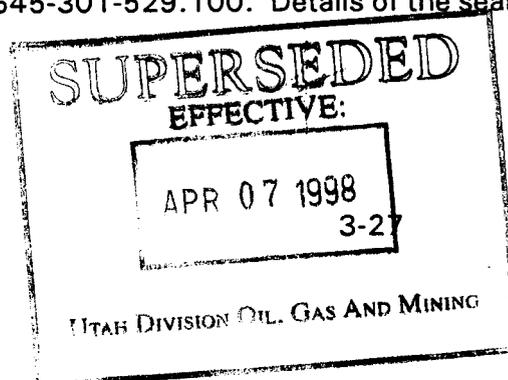
3.5.3.1 Sealing of Mine Openings

When no longer needed for mining operations, all entry ways or other openings to the surface from the underground mine will be sealed and backfilled. Prior to the sealing of the mine openings, all combustible materials will be removed from the portal area. All structures that would interfere with sealing of the mine openings will be removed. The permanent closures will be constructed to prevent access to mine workings by people, livestock, and wildlife. Potential surface drainage will also be kept from entering the sealed entries.

The portals will be backfilled with soil and two rows of solid concrete blocks placed across the entry and then backfilled to the surface and recontoured. The block stoppings will be placed as far from the surface as is necessary to obtain competent top and bottom.

A drain will be placed in the lowest portal of the seam. This drain will be designed using good engineering practices based on the conditions present at the time of sealing, to prevent the accumulation of a hydrostatic head on the portal seams.

The formal sealing methods will be presented as a plan for approval by UDOGM, including cross-sections demonstrating the measures taken to seal or manage mine openings in compliance with R645-301-529.100. Details of the seals are shown on Figures 3-6 and 3-7.



3.5.3.2 Removal of Surface Structures

Following sealing of the portals, all surface structures and facilities associated with the mining operation will be removed. The schedule and cost of removal is detailed in Section 3.5.6 and 3.5.7, respectively.

During reclamation the 4" water pipeline will be disconnected and the ends of the pipe will be plugged and the pipeline abandoned in place. The county is responsible for maintenance of the road cut and pipeline, and requires no further reclamation beyond the disconnection and plugging of the pipeline.

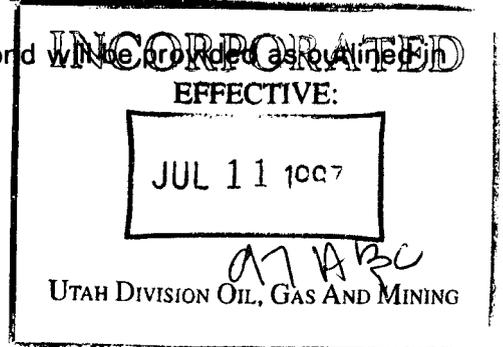
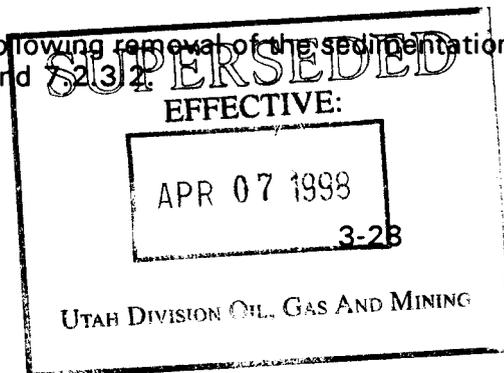
Demolition - All existing structures and roads which lie within the disturbed area boundary will be removed. The roads on either side of Portal Canyon will be removed at the beginning of reclamation work, however the road connecting Jewkes and Portal Canyons will remain until the final phase of reclamation for access to perform tasks associated with final reclamation. Nonhazardous and nonflammable materials, such as concrete and steel, will be used as backfill in areas such as the sediment pond, highwalls, and cut slopes. These materials will be incorporated into the backfill in a manner that will not create voids within the backfill or reduce the effective compaction necessary for backfilling. These materials will be intermixed with backfill to ensure voids are filled and compacted. Additionally, the top four feet will be clean and not contain non-coal waste. Concrete slabs or foundations buried in-place will be covered with a minimum of four feet of fill to ensure adequate root depth and soil moisture retention for vegetation. Whenever possible, steel will be salvaged rather than buried. However, rebar or other steel that is incorporated in the concrete will not be removed from the concrete prior to burial.

Other non-coal wastes found during demolition (or other reclamation activities) including, but not limited to garbage, abandoned mining machinery, lumber, and other combustible materials generated during previous mining activities will be placed and stored in a controlled manner in a designated portion of the mine area. This storage area(s) will be determined at the time of reclamation activities. Final disposal of non-coal mine wastes will be in a designated disposal site within the permit area or at a State-approved solid waste disposal facility. Notwithstanding any other provision of the R645 Rules, any non-coal mine waste defined as "hazardous" will be handled in accordance with the requirements of Subtitle C of RCRA and any implementing agency.

3.5.3.3 Disposition of Dams, Ponds, and Diversions

Diversions that are not planned for permanent use following reclamation will be removed during the backfilling and regrading operations. The area will be recontoured to drain to the final reclamation channel (Section 7.2.3.2, Reclamation Hydrology Design).

Sediment control following removal of the sedimentation pond will be provided as outlined in Sections 3.5.4.3 and 3.5.4.2.



3.5.4 Backfilling and Grading Plans

The surface area was originally disturbed between 1928 and the 1950's by previous owners. The owners made no effort to save/store any topsoil or other soil material; therefore restoration to a contour that approximates pre-mining conditions (Plate 3-6) is neither practical nor required by the regulations. However, it is the intent of Horizon to restore the area to a topography that is compatible with the post-mining land use, using materials that are available at the site (Plates 3-7 and 3-7A). Cut and fill calculations are provided in Table 3-1, for the for the operational to post-mining (i.e., reclamation) phase. The excess fill noted in Table 3-1 will be derived from topsoil, while accounting for compaction of common fill during backfilling.

In general, the backfilling and regrading will proceed as follows:

- (a) After sealing of the portals and removal of all structures, a backhoe (Cat 235 or larger) will be brought to the upper portal terrace (Portal Canyon). The road on the north side of Portal Canyon will be backfilled, regraded, recontoured, fertilized, seeded and mulched (See Sections 3.5.5 for additional method details).
- (b) The backhoe will begin by reaching down over the fill bank and retrieving as much material as can be reached to be placed on the terrace. A dozer (Cat D-7 or larger) will work with the backhoe, taking the retrieved material and spreading and compacting it from the faceup outward.
- (c) The mine yard will then be recontoured using backhoes and dozers to drain to the center of the canyons. The reclamation slopes will be achieved during this backfilling and grading operation. In general, fill material for reclamation will be obtained from adjacent areas of cut material. Prior to cutting or filling in areas shown on Plate 3-7 as having been contemporaneously reclaimed, the topsoil on those areas will be stripped and temporarily set aside in an area that will not be impacted by construction activities. Topsoil stripping operations will be supervised by an individual who is experienced in the field identification of topsoil resources. Once an area is properly prepared, this topsoil will be placed on regraded slopes in accordance with the topsoil placement procedures outlined elsewhere in this M&RP. Based on an affected area of 0.20 acre (as noted on Plate 3-7) and an average topsoil thickness in the contemporaneously reclaimed areas of 11 inches (see Section 8.8.1 of this M&RP), a total of 296 cubic yards of topsoil will be affected by this effort. Reclamation channels (described in Chapter 7) will be constructed to convey runoff through the reclaimed area. Operational culverts will be removed as the construction of the reclamation channel moves down each canyon. Details regarding the reestablishment of drainages in Jewkes Creek and Portal Canyon are provided in Section 7.2.3.2.
- (d) During backfilling and regrading operations, the surface will be scarified to prevent slippage of topsoil and promote root penetration.
- (e) A loader will be used to load topsoil into haul trucks at the topsoil stockpiles. The haul trucks will be used to deliver the topsoil from the topsoil stockpiles to the area. The dozer and backhoe will be working. The dozer will be used to evenly distribute the topsoil over the area.

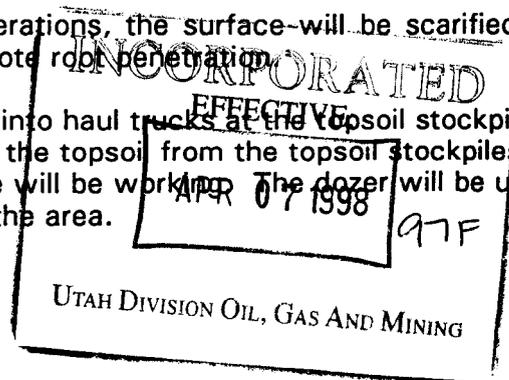
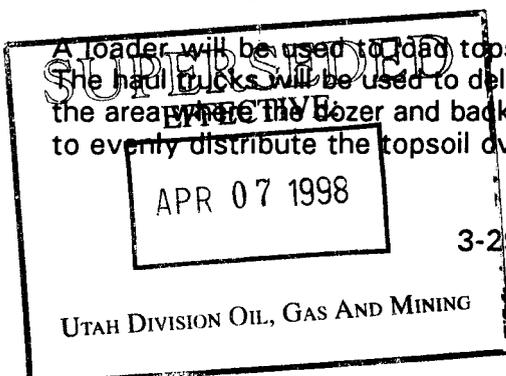
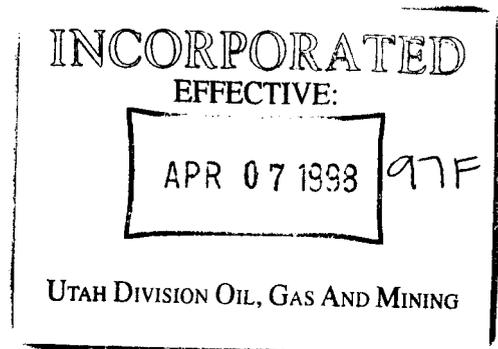
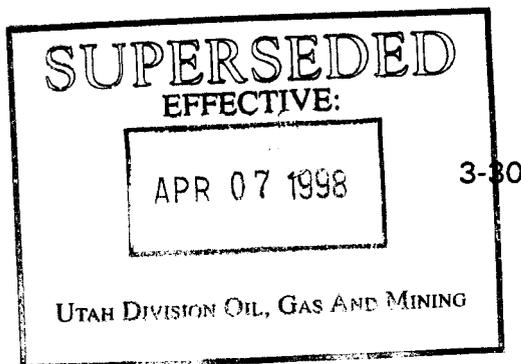
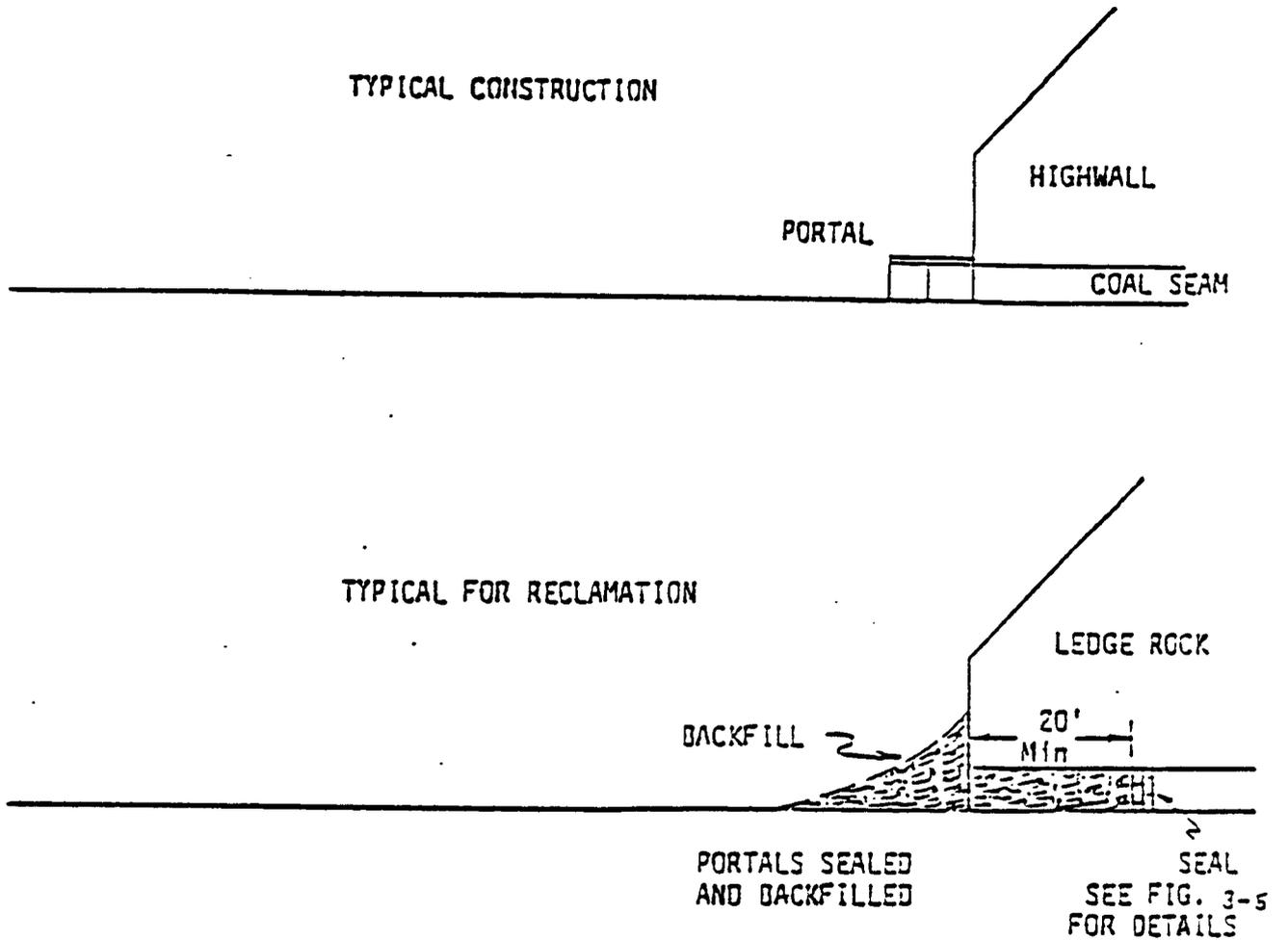


TABLE 3-1
RECLAMATION CUT AND FILL CALCULATIONS

Total inclusion area: 9.15 acres
Cut to Fill ratio: 0.73
Cut volume: 11,695 cubic yards
Fill volume: 15,935 cubic yards

Cut and fill data based on Softdesk Civil/Survey software, release 8.0 and AutoCAD Map software, release 2.





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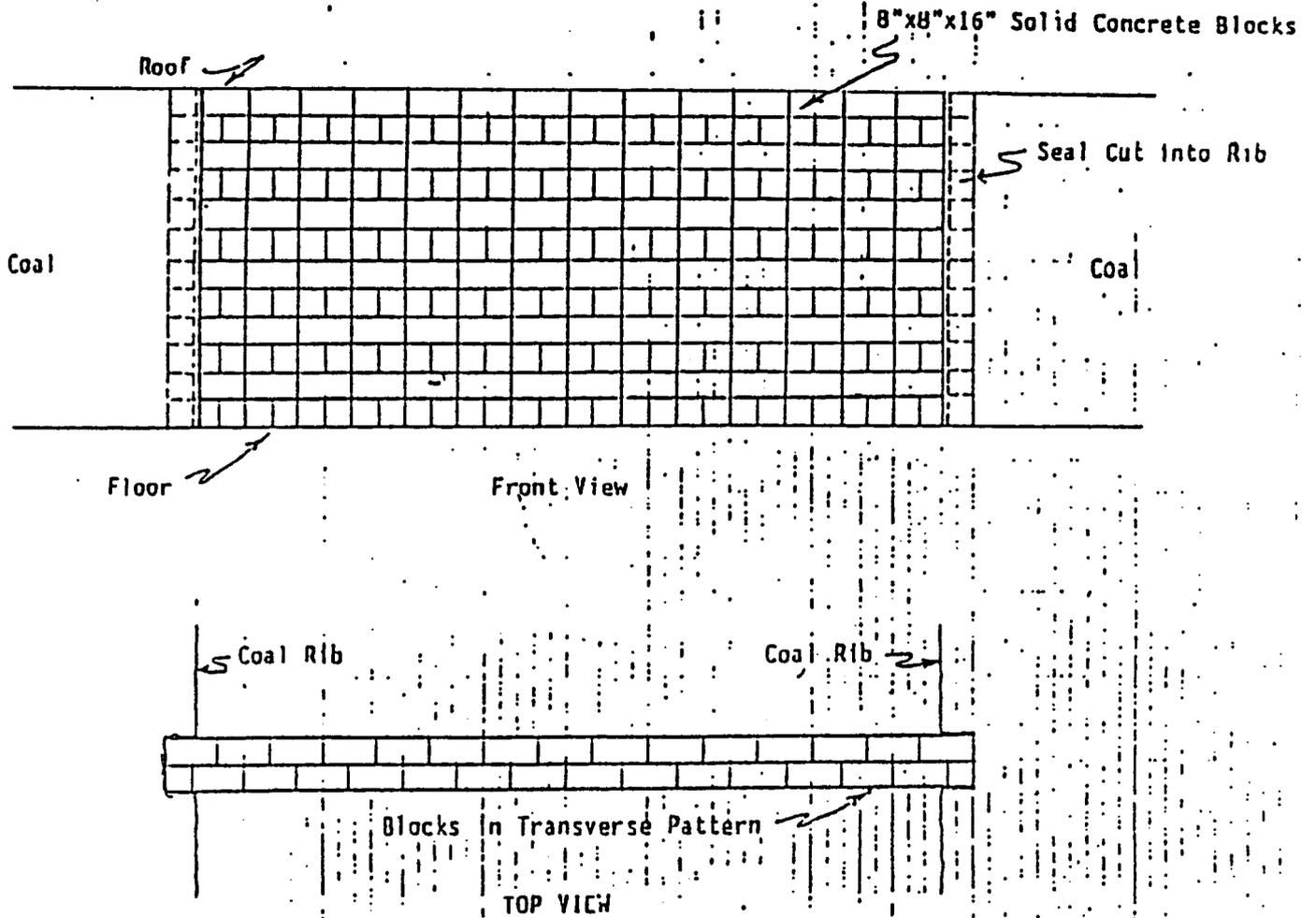


FIGURE 3-7. TYPICAL PORTAL BLOCK SEAL.

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- (f) Following redistribution of topsoil, the site will be reseeded, fertilized, and mulched in accordance with Section 3.5.5. Plates 3-1 and 3-7 show the planned surface facility and the proposed final configuration, respectively. Plate 3-7A presents the related cross sections.
- (g) Depending upon the season of the year and weather conditions the procedures listed above may be completed as one operation from start to finish or may be completed area by area to control erosion and provide drainage. Erosion control matting and sediment controls will be placed throughout the reclamation process as they are needed (see Plate 7-7a).

The schedule for backfilling and grading is detailed in Section 3.5.7.1.

All exposed coal outcrops resulting from this operation as well as toxic and acid-forming materials will be covered with a minimum of 4 feet of non-combustible, non-acid, non-toxic material during backfilling and grading. Similarly, any underground development waste that remains in temporary storage on the surface at the time of reclamation will be placed against an adjacent faceup or cut slope and covered with at least 4 feet of suitable backfill.

3.5.4.1 Removal or Reduction of Highwalls

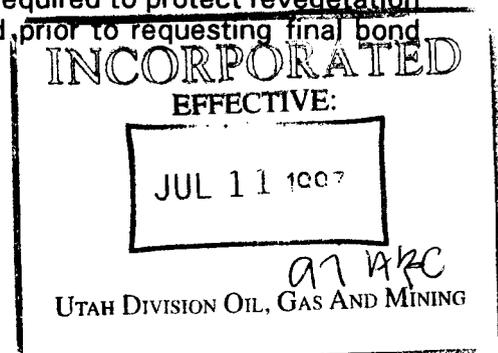
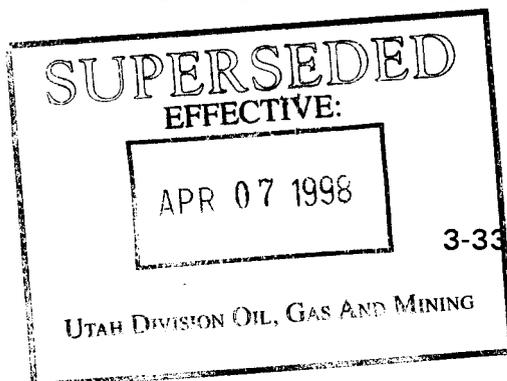
The faceups (highwalls) will be backfilled along the pad and road areas. Erosion controls (silt fences, etc.) will be placed below these backfill areas to minimize washing of the fill materials prior to revegetation. All fills will be compacted to promote stabilization of the backfills.

3.5.4.2 Recontouring

All surface reclaimed areas will be protected and stabilized to effectively control erosion. Final grading, preparation of overburden, and placement of topsoil will be done along the contour to minimize subsequent erosion and instability. Should rills or gullies develop in regraded areas, these will be filled, graded, or otherwise stabilized and then reseeded or replanted. This will be accomplished using the best technology currently available.

3.5.4.3 Fencing and Erosion Control

During redistribution of the topsoil, silt fences will be established and anchored at the bottom of fill slopes and along the top bank of the reclamation channel to control possible erosion from newly graded and seeded areas. The sedimentation pond will be retained as discussed in Section 7.2.3.2. All areas will be mulched during seeding and slopes 2 1/2H:1V or greater will be matted to minimize erosion. Fencing will be placed as required to protect revegetation efforts from livestock grazing. This fencing will be removed prior to requesting final bond release.



3.5.4.4 Soil Redistribution and Stabilization

When final reclamation begins, the disturbed areas to be reclaimed will be loosened by ripping to allow easier backfilling and grading operations. During redistribution of soils, care will be taken to prevent excessive compaction.

Refer to Section 8.8 for further information concerning plans for soil redistribution.

3.5.5 Revegetation Plan

The revegetation plan has been designed to assure that all disturbed lands will be returned to productive self-perpetuating plant communities once the mining operation has been completed. The plan calls for temporary revegetation of disturbed areas where possible during the mining operation as well as permanent reclamation of all areas once mining has ceased.

The goal of the plan is to create diverse plant communities which are at least as productive and in comparable amounts to plant cover existing on the site prior to this mining operation.

3.5.5.1 Soil Preparation

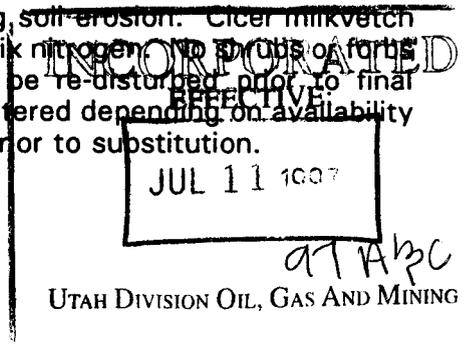
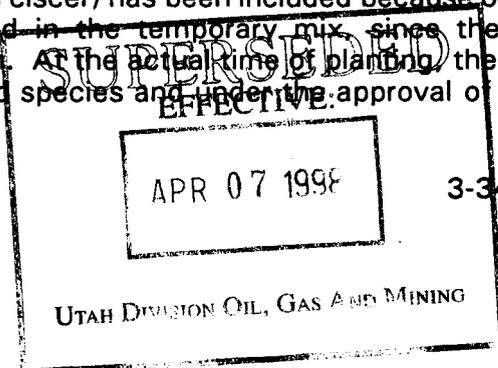
After backfilling, grading, recontouring, scarifying, and the redistribution of topsoil, the seedbed will be prepared using the best technology currently available. Prior to seeding, composite soil samples as will be collected and analyzed as discussed in Section 8.9.. Based on the results of these analyses, fertilizer will be applied at the time of seeding.

3.5.5.2 Seeding

Areas which have been disturbed during mining operations will be reseeded with either Seed Mix #1 (Table 3-2) or with Seed Mix #2 (Table 3-3), as outlined below. These mixes are composed primarily of native species which either occur on the site or would be expected to grow on the site, especially on reclaimed areas. The mixes have been designed to include species which will provide sufficient cover to prevent soil erosion, and should contain sufficient species diversity to produce a stable self-perpetuating plant community. All seeds will comply with applicable state and federal seed laws.

Temporary Seed Mix

On those sites where revegetation is needed during the operating years, a temporary seed mix will be used. This mix (Table 3-2) is composed primarily of native species and is designed for quick establishment and erosion control. Only one introduced grass species (pubescent wheatgrass - *Agropyron trichophorum*), is included in the mix. It has been included since it is known to do well on dry sites, and will assist in controlling soil erosion. Cicer milkvetch (*Astragalus cicer*) has been included because of its ability to fix nitrogen. No shrubs or forbs are included in the temporary mix, since these areas will be re-disturbed prior to final reclamation. At the actual time of planting, the mix may be altered depending on availability of the listed species and under the approval of the Division prior to substitution.



Permanent Seed Mix

The permanent revegetation mix is composed of a mixture of native grasses, forbs, shrubs and trees (Table 3-3). The grasses, forbs, and some of the shrubs will be planted as seeds. The remaining shrubs and trees will be planted as containerized stock. A variety of species are included in the mix in order to obtain a higher level of diversity on the revegetated surfaces. This will increase habitat diversity as variations in the microenvironments of the reclaimed surface will enhance or inhibit the germination and development of the various species.

The permanent seed mix reflects the composition of the original communities which occurred on the site. Cicer milkvetch is the only introduced species in the permanent seed mix. It is included because of its ability to fix nitrogen. Approval will be obtained from the Division prior to using any substitution in seed mixtures and on the number of containerized shrubs needed per acre.

The riparian seeding mix is included in Table 3-3.

Seeding Methods

Reclaimed areas will be seeded by broadcasting. Seeds when broadcast will be raked to ensure proper seed/soil contact. See Tables 3-2 and 3-3 for the seeding rates. If the first seeding does not establish, the area will be reseeded. Reclaimed areas will be seeded in the fall. Since the majority of the species in the mix are cool season grasses, fall is a better time to plant. The containerized stock will be planted in late fall or early spring, attempting to avoid undesirable conditions such as overly wet, overly dry, or frozen soils. Should the planting window close prior to completion of seeding, a sterile, quick growing ground cover will be planted to control erosion during the winter months. The final reclamation seed mixture will be planted during the following year. Small depressions will be left in areas where containerized stock is planted to accumulate water during wet periods.

In the riparian disturbed area (see Section 9.4.1.2) the containerized willow stock will be planted in clumps along the banks of Jewkes Creek. Other containerized shrubs and sedges will be planted in clumps within the riparian area. The seed mix (Table 3-3, Riparian Reclamation Seeding Mix) will be planted using the methods described above.

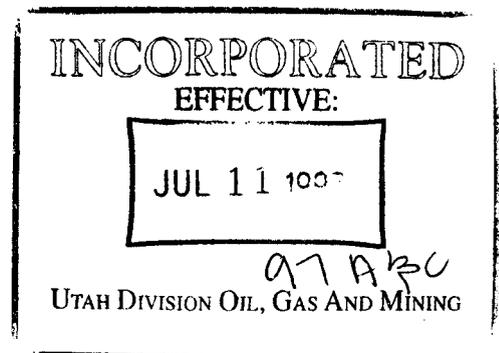
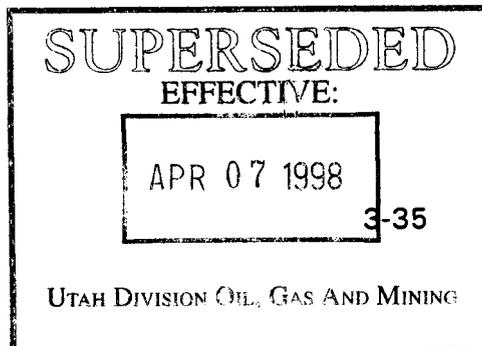


TABLE 3-2
Reclamation Seed Mix #1

Species	Pounds of PLS per acre
<u>PERENNIAL GRASSES</u>	
Streamband Wheatgrass (Agropyron riparium)	8.0
Bluebunch Wheatgrass (Agropyron spicatum)	4.0
Slender Wheatgrass (Agropyron trachycaulum)	8.0
Pubescent Wheatgrass (Agropyron trichophorum)	6.0
Indian Ricegrass (Oryzopsis hymenoides)	4.0
<u>FORBES</u>	
Cicer Milkvetch (Astragalus cicer)	4.0
TOTAL	34.0

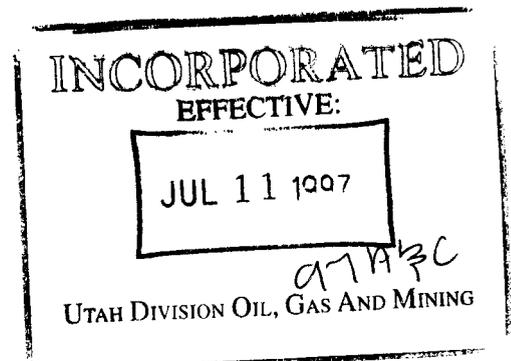
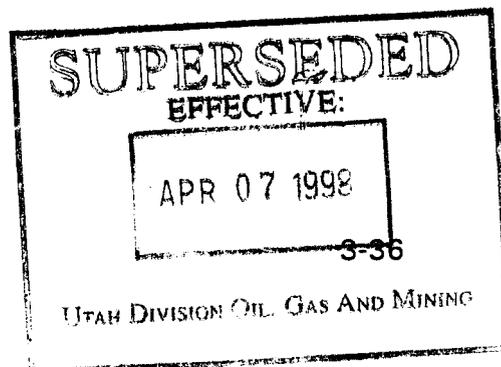


TABLE 3-3
 Reclamation Seeding Mix #2

SPECIES	POUNDS OF PLS PER ACRE
<u>SHRUBS</u>	
Serviceberry Amelanchier utahensis	4.0
Big Sagebrush (Vasey) Artemisia tridentata	0.4
Mtn. Mahogany Cercocarpus ledifolius	4.0
Wyoming Big Sagebrush (Gordon Creek Var.) Artemisia tridentata wyomingensis	1.0
<u>FORBS</u>	
Yarrow Achillea millifolium	0.2
Pacific Aster Aster chilensis	0.4
Northern Sweetvetch Hedysarum boreale	3.0
Lewis Flax Linum lewsii	2.0
Palmer's Penstemon Penstemon palmeri	1.0

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TABLE 3-3 (Continued)
 Reclamation Seeding Mix #2

SPECIES	POUNDS OF PLS PER ACRE
<u>GRASSES</u>	
Gt. Basin Wildrye Elymus cinereus	6.0
Thickspike Wheatgrass Elymus lanceolatus	4.0
Western Wheatgrass Elymus smithii	6.0
Bluebunch Wheatgrass Elymus spicatus	6.0
Indian Ricegrass Stipa hymenoides	4.0
TOTAL	42.0
<u>CONTAINERIZED STOCK</u>	
Oak Brush Quercus gambelii	400
Aspen Populus tremuloides	300
White Fir Abies concolor	200
Big-tooth Maple Acer grandidentatum	400

Serviceberry
 Amelanchier alnifolia
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TABLE 3-3 (Continued)
 Reclamation Seeding Mix #2

SPECIES	PLANT/ACRE
Mountain Mahogany Cercocarpus montanus	400
Oregon Grape Mahonia repens	500
TOTAL	2,500

Riparian Reclamation Seeding Mix

SPECIES	PLANT/ACRE
<u>SHRUBS</u>	<u>CONTAINERIZED/ROOT CUTTING STOCK</u>
Snowberry Symphoricarpos oreophilus	300
Wood Rose Rosa woodsii	300
Willow Salix	1,100
Water Birch Betula occidentalis	300
TOTAL	2,000

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TABLE 3-3 (Continued)
 Riparian Reclamation Seeding Mix

SPECIES	POUNDS OF PLS PER ACRE
FORBS	
Yarrow Achillea millifolium	1.0
Pacific Aster Aster chilensis	1.0
Prairie Sage Artemisia ludoviciana	1.0
Marsh Indian Paintbrush Castilleja exilis	1.0
Wild Geranium Geranium viscosissimum	1.0
TOTAL	5.0
GRASSES	
Blue Wildrye Elymus glaucus	8.0
Kentucky Bluegrass Poa pratensis	4.0
Gt. Basin Wildrye Elymus cinereus	6.0
Idaho Fescue Festuca idahoensis	4.0

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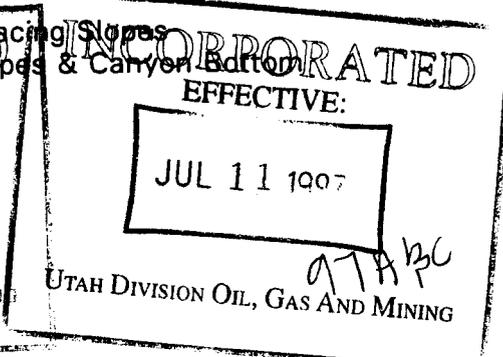
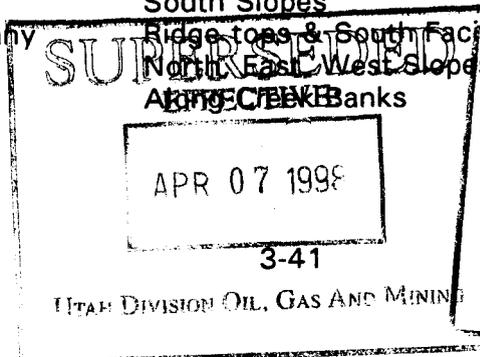
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TABLE 3-3 (Continued)
 Riparian Reclamation Seeding Mix

SPECIES	POUNDS OF PLS PER ACRE
Western Wheatgrass Elymus smithii	6.0
Bluebunch Wheatgrass Elymus spicatus	6.0
Indian Ricegrass Stipa hymenoides	6.0
TOTAL	40.0
<u>CONTAINERIZED/ROOT CUTTING STOCK</u>	<u>PLANT/ACRE</u>
Nebraska Sedge Carex nevrascensis	200
Beaked Sedge Carex rostrata	200
TOTAL	400

Locations where containerized stock will be planted:

- | | |
|-------------------|--|
| Oakbrush | South & East Slopes |
| Aspen | North Slopes & Canyon Bottoms |
| White Fir | North Slopes |
| Big-tooth Maple | North Slopes & Canyon Bottoms |
| Serviceberry | South Slopes |
| Mountain Mahogany | Ridge tops & South Facing Slopes |
| Oregon Grape | North, East, West Slopes & Canyon Bottom |
| Willow | Arroyo/Creek Banks |



3.5.5.3 Mulching

During reclamation mulch will be applied to all newly reseeded areas in order to provide a more equitable environment for seed germination and initial growth. A mulch will be applied at a rate of 2000 pounds per acre. Once applied, the mulch will be incorporated while the surface is being roughened before seeding. Erosion control matting will be placed on all slopes 2 1/2H:1V or steeper.

At the time of reclamation the most beneficial type of mulch to be used will be determined by Horizon and UDOGM, for bonding purposes the price will be assumed to be that for alfalfa.

3.5.5.4 Reclamation Management

The reclaimed and revegetated areas will be closely monitored to determine if any maintenance is necessary (refer to Sections 3.5 and 9.8 for a description of the monitoring program). Problems which may require management include severe erosion, excessive weeds, bare patches of failed planting, and damage by wildlife. When necessary soil erosion will be controlled by regrading, application of mulch, and matting. If weeds occur, a weed control plan will be proposed to UDOGM and implemented upon approval. No weed control will be attempted during the first growing season. It is likely that weed species will form a conspicuous part of the vegetation on the reclaimed areas during the first year but will be replaced by revegetative species thereafter.

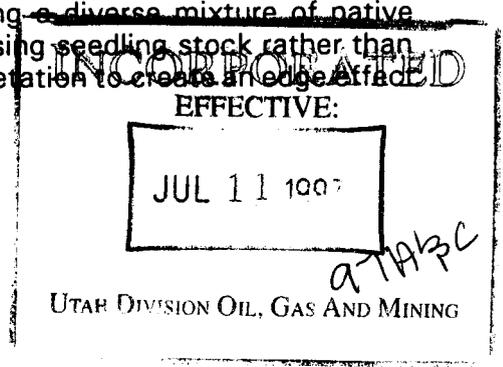
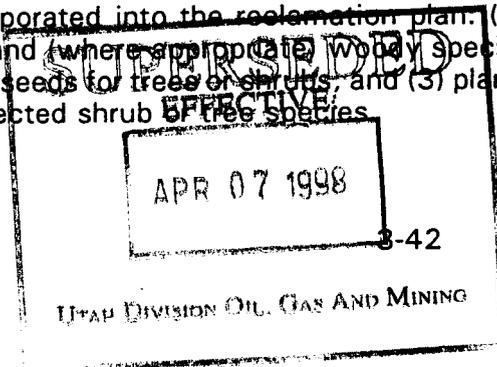
3.5.5.5 Revegetation Monitoring

Revegetated areas will be monitored in accordance with Section 9.8 of this permit application.

Due to weather conditions during the winter of 1996/1997 Horizon was unable to complete the surveying of the partially constructed mine site. This circumstance has made it difficult to redesign the reclamation channels in either Portal or Jewkes Canyons due to lack of as-built contours. Until this surveying can be completed, the reclamation channel design and revegetation requirements of "Attachment A, Special Conditions to Permit Approval" cannot be met with accuracy. Therefore the information would not be of value in satisfying the regulations, thus requiring an additional review by UDOGM. Horizon commits to address the stipulations pertaining to regulation R645-301-353 within 30 days after the surveying is completed.

3.5.5.6 Establishment of Wildlife Habitat

Reclamation is particularly important as a means of controlling erosion and restoring disturbed areas to a productive state. To assist in meeting these desirable ends, the following aspects have been incorporated into the reclamation plan: (1) planting a diverse mixture of native grasses, forbs, and (where appropriate) woody species, (2) using seedling stock rather than relying solely on seeds for trees or shrubs, and (3) planting vegetation to create an edge effect by clumping selected shrub or tree species.



Section 10.5 provides a detailed discussion of the reclamation, mitigation and management plans for terrestrial habitats and wildlife.

Enhancement of the area for wildlife will be accomplished by the installation of rock piles for smaller mammals, the improved revegetation of the area, and planting of Salix cuttings per acre along the creek banks within the disturbed area. Rock piles will be scatter along the perimeter of Jewkes Creek, and through Portal Canyon. Containerized shrub stock will be planted near the rock piles to provide additional cover and as a food source. The appropriate regulatory agencies (i.e., UDOGM, DWR) will be consulted as to the frequency and placement of the rock piles during reclamation.

3.5.6 Reclamation Monitoring

The standards for success in the previously disturbed areas of the site are outlined in section R645-301-356.250 of the regulations. The applicant intends to return the previously disturbed areas to stable plant communities capable of withstanding the intended post-mining land use and controlling erosion (see Section 9.8).

3.5.7 Schedule of Reclamation for Horizon Mine

3.5.7.1 Timetable for Completion of Major Reclamation Processes

The approximate schedule of reclamation activities is outlined in Table 3-4. The graphical schedule has been extended by approximately 10 percent beyond the numerical estimates presented below to account for unanticipated delays. Reclamation is proposed to be initiated within 90 days (weather permitting) of final abandonment of the mining operation. Each listing is for an 8-hour work day.

The Phase I reclamation tasks are therefore proposed to be completed within 24 weeks following the start of reclamation activities, assuming adequate weather conditions. Eight weeks are planned for the completion of Phase II reclamation tasks.

Due to the size and topography of the mine site, the concept of completing reclamation activities in Portal Canyon prior to starting reclamation activities in Jewkes Canyon is not feasible. Potential problems include having to move topsoil twice and not having the fill in Jewkes Canyon to reclaim slopes in Portal Canyon. Horizon commits to begin reclamation activities in Portal Canyon and to leave the sediment pond and UC-1 located in Jewkes Canyon in place as long as possible. Prior to the removal of the sediment pond during reclamation, UDOGM hydrologist will be notified and given the opportunity to inspect and endorse the removal. The timetable and sequence for removal of sediment control structures will depend upon the season of the year and precipitation.

3.5.8 Cost Estimate for Final Reclamation

The estimated cost to reclaim the Horizon No. 1 Mine surface facilities is provided in Appendix 3-7.

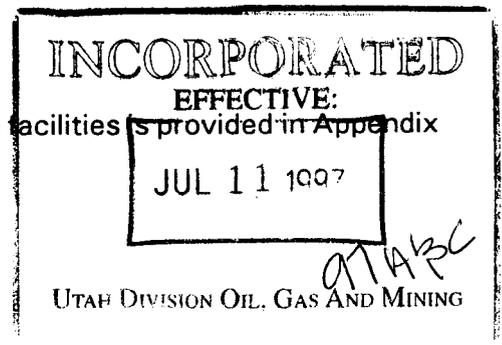
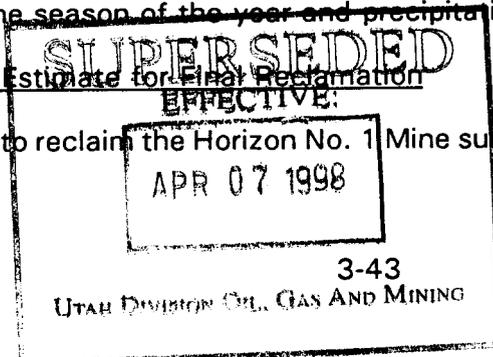


TABLE 3-4
 Reclamation Timetable

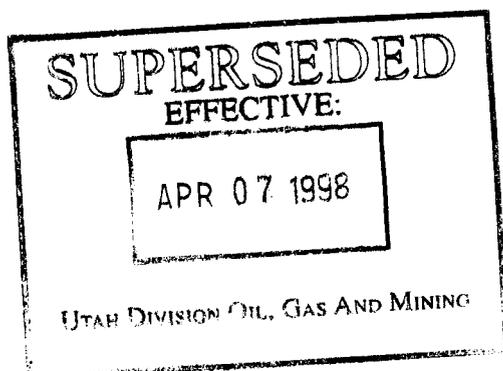
Task	Months from Start of Reclamation					
	1	2	3	4	5	6
PHASE I						
Seed/Plant Ordering *	-----					
Portal Sealing	-----					
Demolition - Structure Removal	-----	-----				
Rough and Final Grading		-----	-----	-----		
Construction of Reclamation Channels and Installation of Sediment Controls			-----	-----		
Soil Testing/Order Amendments				-----		
Topsoil Distribution				-----	-----	
Seeding & Mulching						-----
Vegetation/Water Monitoring	10 years after seeding or until bond release					
PHASE II - To Follow Phase I Bond Release						
Seed/Plant/Amendment Ordering *	-----					
Grading (Disturbed Area Access Road)					-----	
Topsoil Distribution					-----	
Seeding & Mulching						-----
Reclamation Monitoring	Until bonding requirements are satisfied					

* Seed and plants will be ordered one year prior to their proposed planting time.

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APPENDIX 3-7
RECLAMATION BOND ESTIMATE



COST ESTIMATE FOR FINAL RECLAMATION

The time and work required (as presented below) were estimated using the Means Site Work Cost Data 1992, 11th Annual Edition. Each listing is for an 8-hour work day.

1. Sealing Portal

Pg. 139 - Format 042 200 (232-4200)
Daily Output 375 Square Feet
Cost \$1.20 per block 8" x 16" x 8" thick
3 Portals Sealed 15' wide x 7' high
Total sq. ft. required 630

3 Days

2. Remove Structures

Pg. 30 - Format 021 200 (204-0200)
Daily Output (Move 1 Unit per Day)
Units on site:

2 Bathhouse trailers
1 Office trailer
1 Parts Trailer
1 Storage Trailer

5 Days

Portal Structure
Pg. 26 - Format 020 700 (714-2000)
Daily Output 500 linear feet per day
16 beams per portal x 3 portals
Total 48 beams

2 Days

Substation Removal
Pg. 30 - Format 021 200 (204-0200)

2 Days

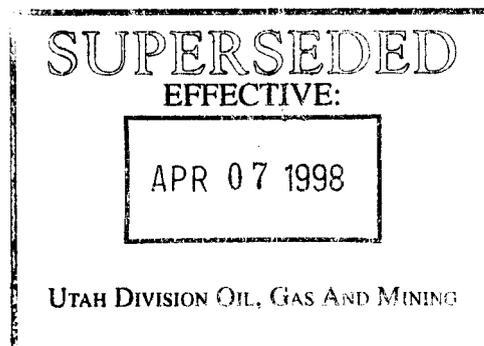
Belt Structure Removal
Pg. 26 - Format 020 700 (714-2000)
Daily Output 500 linear feet per day
Total Structure consists of: 160 beams
60 Belt Frames = 120 structural beams
3 Ramp Structures = 40 structural beams

2 Days

Drive and Tailpiece Removal
Estimated
Actual work performed at mining operations
Daily Output 1 Drive + 1 Tailpiece per day
2 Drives to be removed
2 Tail pieces to be removed

2 Days

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3. Culvert removal

Pg. 40 - Format 022 200 (254-120)
1 cu. yd. hydraulic backhoe
Daily Output 400 cu. yds. per day
12" culvert removal - 60 ft. - 27 cu. yds.
18" culvert removal - 120 ft. - 62 cu. yds.
24" culvert removal - 720 ft. - 427 cu. yds.
36" culvert removal - 1030 ft. - 763 cu. yds.

Total = 1279 cu. yds.

4 Days

4. Soil Placement (backfilling)

Hauling total soil by dump truck 1/2 mile.
Pg. 41 - Format 022 200 (266-0320)
Daily Output 3.2 loads/hr. 12 cu.yd. ea.
Daily Output 308 cu.yds.
Daily Output for 3 trucks 924 cu. yds.
Soil placement = 16,300 cu. yds. (rounded)

18 Days

Grading (Dozer)

Pg. 38 - Format 022 200 (242-5020)
Daily Output 1,650 cu. yds.
Cu. Yds. = 16,300

10 Days

Scarifying (Road Grader)

Pg. 101 - Format 029 200 (204-2620)
Daily Output 12,222 sq. yds.
Disturbed Area = 9.15 acres
Disturbed Area = 44,300 sq. yds.

4 Days

5. Mulching and Seeding

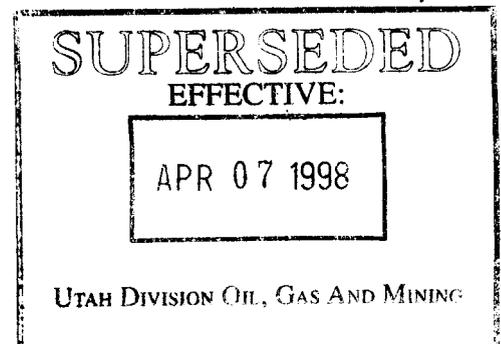
Pg. 104 - Format 029 500 (516-0550)
Daily Output 700 thousand sq. ft.
Permit area = 9.15 acres
Total sq. ft. = 398,699

2 Days

6. Tree and Shrub Planting

Pg. 105 - Format 029 500 (521-0561)
Daily average 364 plants per person
10 people planting

2 Days



7. Protective Fencing

Pg. 23 - Format 020 550 (554-0650)
 Daily Output 280 Linear Feet
 Fencing Required 2210 ft.

8 Days

Total Days Required =

64 Days

Total Weeks (5 days per week) =

13 Weeks

Equipment Requirements

Rental rates are located in the Rental Rate Blue Book for Construction Equipment, Volume 1, dated April 1991 (except as noted). Rental rates were assumed for as 8-hour work day. Pages for each equipment are listed by the equipment listed. Operating costs for equipment include fuels, maintenance, and lubricants.

Operator costs were obtained from the U.S. Department of Labor, General Wage Decision No. UT91-3. Pages for each operator's wages are listed by the operator.

1. Loader - 950 B (3 cu. yd. bucket, 8 hr. shifts)

Equipment Rental (Pg. 9-17)		
Daily	\$ 300.00	\$ 404.00
Operating costs/hr.	\$ 13.00 x 8 = \$104	
Operator (Pg. 414) Group 4		
Hourly	\$ 18.60	\$ 213.04
Fringe Benefits	\$ 8.03	
Total		\$ 617.04

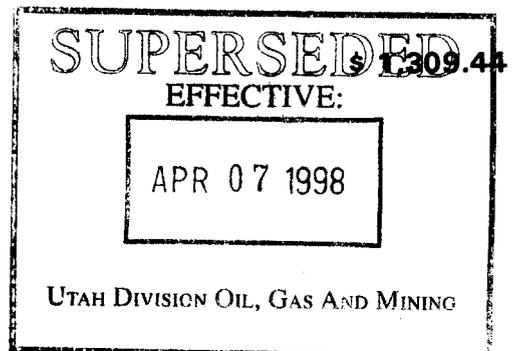
2. Truck (10-12 yd.)

Equipment Rental (Pg. 20-1)		
Daily	\$150.00	\$ 252.00
Operating costs/hr.	\$ 12.75 x 8 = \$102	
Operator (Pg. 412)		
Hourly	\$ 16.54	\$ 184.48
Fringe Benefits	\$ 6.52	

3 Trucks required \$ 436.48 x 3

Total

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3. Cat - D-7G

Equipment Rental (Pg. 9-29)		
Daily	\$ 555.00	\$ 715.80
Operating costs/hr.	\$ 20.10 x 8 = \$160.80	
Operator (Pg. 414) Group 4		
Hourly	\$ 18.60	\$ 213.04
Fringe Benefits	\$ 8.03	
Total		\$ 928.84

4. Cat - D-7G (implements)

Cat Ripper 359		
Equipment Rental (Pg. 9-35)		
Daily	\$175.00	
Operating costs/hr.	\$ 3.70 x 8 = \$29.60	
Total		\$ 204.60

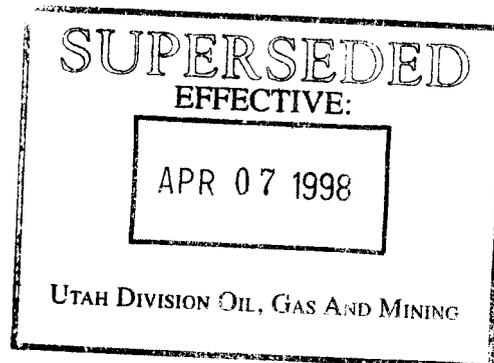
5. Road Grader (implements)

Scarifiers-Disk 5 shank		
Equipment Rental (Pg. 9-3)		
Daily	\$ 9.00	
Operating costs hr.	\$.30 x 8 = \$2.40	
Total		\$ 11.40

6. Road Grader (Cat 120G)

Equipment Rental (Pg. 9-1)		
Daily	\$225.00	\$ 313.00
Operating costs/hr.	\$ 11.00 x 8 = \$88	
Operator (Pg. 414) Group 4		
Hourly	\$ 18.60	\$ 213.04
Fringe Benefits	\$ 8.03	
Total		\$ 526.04

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7. Backhoe (Cat 225D)

Equipment Rental (Pg. 10-4 dated 6/91)		
Daily	\$ 545.00	
Operating costs/hr.	\$ 17.45 x 8 = \$139.60	\$ 864.60
Operator (Pg. 416) Group 4		
Hourly	\$ 18.60	
Fringe Benefits	\$ 8.03	\$ 213.04
Total		\$ 897.64

8. Labor (Pg. 410)

Hourly	\$ 12.82 x 8 = \$102.56	
Fringe Benefits	\$ 3.09 x 8 = \$ 24.72	
Total		\$ 127.28

9. Foreman (Means Site Work Cost Data, 1992, inside of back cover)

Hourly	\$ 39.60 x 8 = \$316.80	
Total		\$ 316.80

Cost Estimate Detail for Final Reclamation

(a) Mobilization

\$3000 Lump (estimated)	
Total	\$ 3,000.00

(b) Sealing Portals

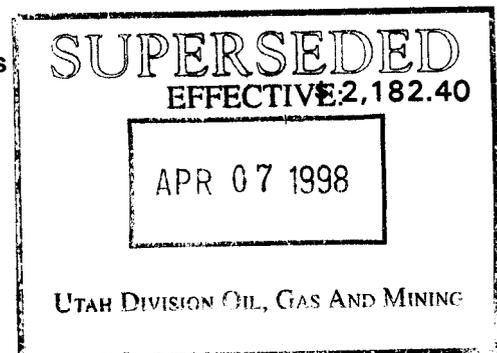
Laborers 5 @ \$127.28/day = \$ 636.40 x 3 days	
Subtotal	\$ 1,909.20
Materials Sealing 3 Portals	\$ 1,984.50
Total	\$ 3,893.70

(c) Structure Removal

Building Removal

1 Truck + Operator per day = \$ 436.48 x 5 days	
Subtotal	

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Portal Structure Removal

1 Truck + Operator per day = \$ 436.48 x 2 days
3 Laborers per day = \$127.28 x 2 days
Subtotal \$1,227.52

Belt Structure Removal

1 Truck + Operator per day = \$ 436.48 x 2 days
3 Laborers per day = \$127.28 x 2 days
Subtotal \$ 1,227.52

Drive and Tailpiece Removal

1 Loader + Operator per day = \$ 617.04 x 2 days
1 Truck + Operator per day = \$ 436.48 x 2 days
3 Laborers per day = \$ 381.84 x 2 days
Subtotal \$ 2,870.72

Substation Removal

1 Truck + Operator per day = \$ 436.48 x 2 days
3 Laborers per day = \$127.28 x 2 days
Subtotal \$1,227.52

Total **\$ 8,735.68**

(d) Culvert Removal

Backhoe + Operator per day = \$ 854.44 x 4 days
Total \$ 3,417.76

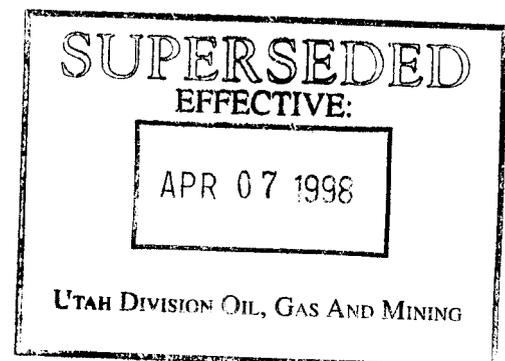
(e) Surface Storage Removal (Load and Haul)

1 Loader + Operator per day = \$ 617.04 x 1 day
Subtotal \$ 617.04

Coal Stockpile

1 Truck + Operator per day = \$ 436.48 x 1.5 days
2 Laborers per day = \$127.28 x 2 days
Subtotal \$909.28

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Waste Rock Stockpile

1 Truck + Operator per day = \$ 436.48 x 1.5 days
2 Laborers per day = \$127.28 x 2 days
Subtotal \$909.28
Total \$ 2,435.60

(f) Soil Placement (Backfilling & Grading)

3 Dump Trucks + Operators per day = \$ 1,309.44 x 25 days
Subtotal \$ 32,736.00
1 Loader + Operator per day = \$ 617.04 x 25 days
Subtotal \$ 15,426.00
1 Cat + Operator per day = \$ 928.84 x 14 days
Subtotal \$ 13,003.76
Scarifying
1 Grader + Operator + Scarifiers/day = \$ 537.44 x 5 days
Subtotal \$ 2,687.20
Total \$ 63,852.96

(g) Mulching + Seeding

Mulcher + Operator per day = \$ 332.68 x 2 days
1 Laborer per day = \$ 127.28 x 2 days
Subtotal \$ 919.92
Seeds @ \$310.78/acre x 10.3 acres
(see Tables 3-2 and 3-3) \$ 3,347.10
Total \$ 4,267.02

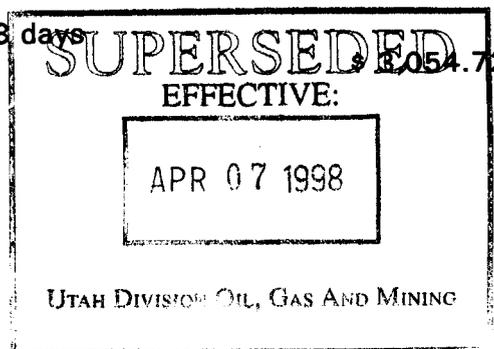
(h) Tree & Shrub Planting

10 Laborers @ \$127.28 per day x 2 days \$ 2,545.60
Seedlings @ \$1.00 (will be used as needed, quantity approximate) \$ 3,500.00
Total \$ 6,045.60

(i) Fencing

3 Laborers @ \$127.28 per day = \$ 381.84 x 8 days
Subtotal \$ 3,054.72

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Material Costs for 2210 linear ft. (Costs from Intermountain Farmers)		
Fencing	\$ 399.50	
Posts	\$ 455.70	
Stays	\$ 76.00	
Subtotal of material		\$ 931.20
Total		\$ 3,985.92

(j) Foreman (Means Site Work Cost Data, 1992,
11th Annual Edition (Inside of back cover)

\$316.80 per day x 76 days		
Total		\$ 24,076.80

(k) Maintenance & Monitoring

1 Engineer @ \$47.00/hr., 1 day per quarter, 4 quarters per year for 10 years	\$ 15,040.00	
1 Laborer @ 127.28/day, 1 day per quarter, 4 quarters per year for 10 years	\$ 5,091.20	
Total		\$ 20,131.20

(l) Agency Inspection and Supervision

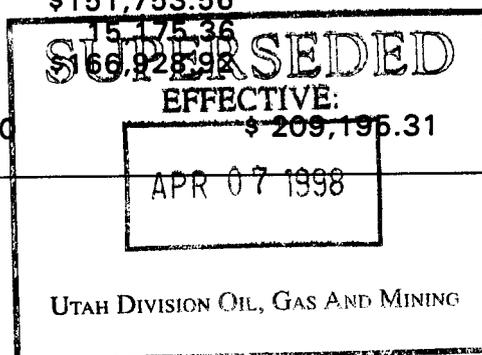
5.5% of the above amounts (reference Handbook for Calculation of Reclamation Bond Amounts, OSM, 1987, Graph 3, p. 19)	\$ 143,842.24 x 0.055	
Total		\$ 7,911.32

Summary of Reclamation Cost Estimate

The inflation factor was based on those provided by UDOGM.

a.	Mobilization (estimated)	\$	3,000.00
b.	Sealing Portals		3,893.70
c.	Structure Removal		8,735.68
d.	Culvert Removal		3,417.76
e.	Surface Storage Removal		2,435.60
f.	Backfilling & Grading		63,852.96
g.	Seeding and Mulching		4,267.02
h.	Tree & Shrub Planting		6,045.60
i.	Fencing		3,985.92
j.	Foreman		24,076.80
k.	Maintenance & Monitoring		20,131.20
l.	Agency Inspection and Supervision		7,911.32
	Sub-Total		\$151,753.56
	10% Contingency*		15,175.36
	Total (1992)		166,928.92

Total escalated to the year 2000



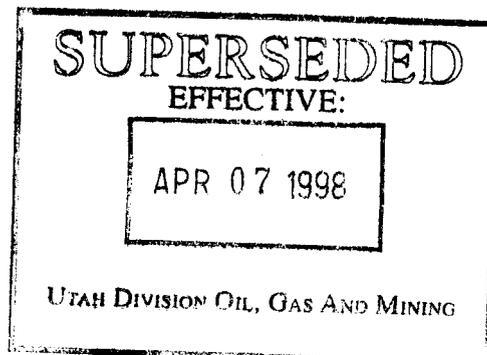
ESCALATION CALCULATIONS HORIZON NO. 1 MINE

YEAR	RECLAMATION COST	%	TOTAL = RECLAMATION COST MULTIPLIED BY %
1992	\$166,928.92	2.21	\$170,618.05
1993	\$170,618.05	2.61	\$175,071.18
1994	\$175,071.18	3.21	\$180,690.96
1995	\$180,690.96	1.93	\$184,178.30
1996	\$184,178.30	2.58	\$188,930.10
1997	\$188,930.10	2.58	\$193,804.50
1998	\$193,804.50	2.58	\$198,804.66
1999	\$198,804.66	2.58	\$203,933.82
2000	\$203,933.82	2.58	\$209,195.31

* Reference: Handbook for Calculation of Reclamation Bond Amounts, OSM, 1987, Table 4, p.15.

Coal stockpiled upon cessation of mining will be sold, however at the request of UDOGM it's removal has been included as a reclamation cost.

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Culvert UC-2 will receive runoff from Portal Canyon. The 100-year, 6-hour peak flow for this culvert is 8.3 cfs. A 24-inch diameter culvert is planned to be installed at this location. This size is based on inlet control and a headwater to depth ratio of one or less. A trash rack will be installed on the inlet to this culvert, as indicated in Figure 7-8.

Culvert UC-3 will receive runoff from Jewkes Creek. The 100-year, 6-hour peak flow to this culvert is 19.6 cfs. This flow can adequately be handled by a 30-inch diameter culvert, based on inlet control and a headwater to depth ration of one or less.

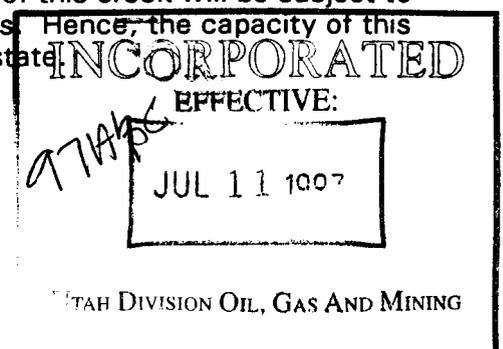
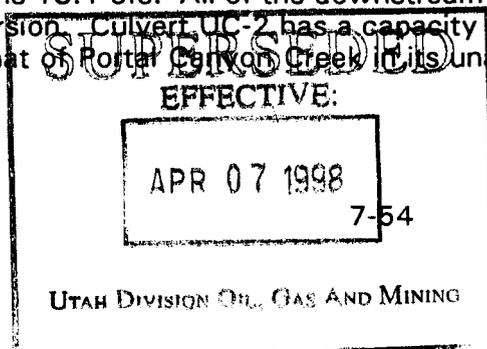
Discharge at the outlet of culvert UC-1 will have an exit velocity of approximately 10.4 fps (see Appendix 7-4). This will be controlled by installing an outlet channel and impact pool. The outlet channel will have graded riprap on the bottom and along the sides of the channel for an approximate distance of 30 feet downstream from the culvert outlet to a transition to a compound channel with a riprapped low flow channel and vegetated flood plain, as proposed for the final reclamation channel (see Plates 7-4 & 7-6). The riprap in the outlet channel and the low flow channel will have a median diameter of 0.5 foot and will be placed at a thickness of 12 inches. The gradation of the riprap is presented in Table 7-6. A geotextile material will be installed beneath the outlet channel riprap as a filter blanket. A sand filter will be installed beneath the low flow channel riprap.

The outlet channel will act as an impact pool for flows from the culvert or emergency spillway. The impact pool will be created by the transition to the compound channel, due to the shallower depth of the low flow channel versus outlet channel. Under flow conditions, the water will fill the outlet channel and spill to the low flow channel until its capacity is exceeded and then spread out into the flood plain. This will ensure that low flows can be conveyed through the area, while high flows will spread over the flood plain. Additionally, the shallow depth of the low flow channel will ensure the capability of sub-irrigation and seepage into the surrounding flood plain.

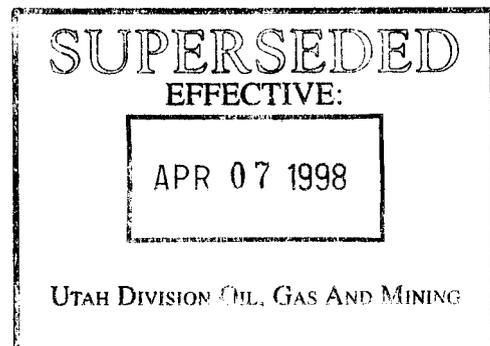
By constructing these channels during operations, the area will not need to be disturbed again during reclamation. The riparian area will already be established around the channels and the area will be stabilized. If these channels are not included in the initial disturbance, then the area will be redisturbed upon reclamation.

Calculations contained in Appendix 7-4 indicate that the flow capacity of the unaltered Jewkes Creek upstream from culvert UC-3 is 27.7 cfs. The flow capacity of the unaltered Jewkes Creek downstream from culvert UC-1 is 38.7 cfs. Culverts UC-1 and UC-3 have design capacities of 59 cfs and 40 cfs, respectively. Hence, the capacities of these culverts exceed the capacity of Jewkes Creek in its unaltered state.

As indicated in Appendix 7-4, the capacity of the unaltered Portal Canyon Creek upstream from culvert UC-2 is 13.1 cfs. All of the downstream portion of this creek will be subject to the culverted diversion. Culvert UC-2 has a capacity of 22 cfs. Hence, the capacity of this culvert exceeds that of Portal Canyon Creek in its unaltered state.



APPENDIX 7-12
STREAM ALTERATION PERMIT



CHAPTER 8
SOIL RESOURCES

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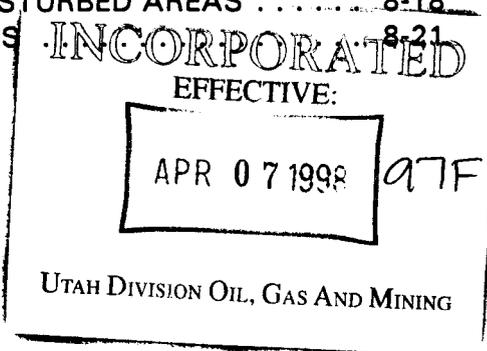
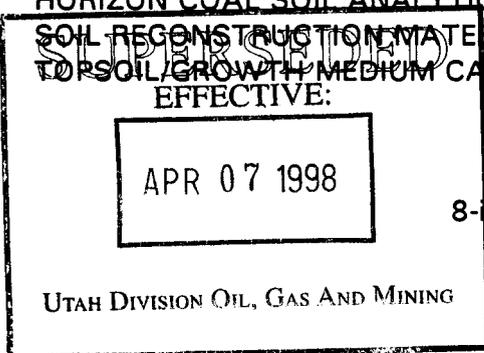
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CHAPTER 8
SOIL RESOURCES

8.1 Scope

A soil inventory of the Horizon Mine area was conducted to provide soil resource information to meet the requirements of UDOGM and OSM. The soil survey was performed by Richard A. Foster, Soil Scientist, (USDA Soil Conservation Service) in February 13, 1990 (Section 8.3.1). This is in addition to the soil survey which was performed by George Cook (Range Conservationist), Earl Jensen (Soil Scientist) and Gary Moreau (District Conservationist) of the SCS in May 1980 (Appendix 8-1).

8.2 Methodology

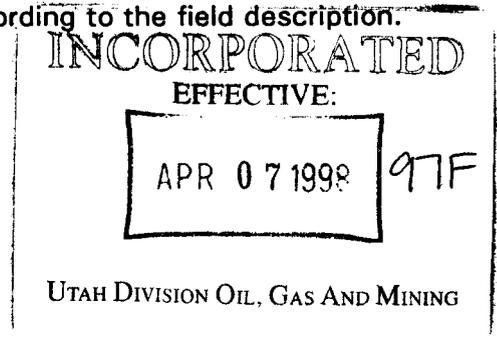
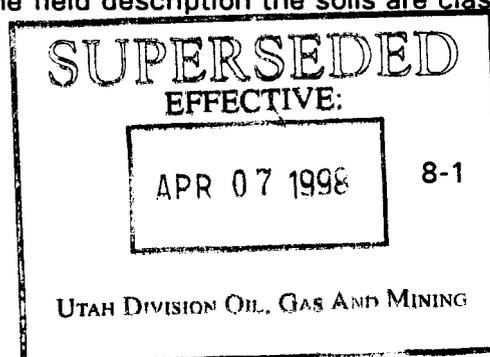
Soil mapping of the area (Plate 8-1) is a refinement of USDA Soil Conservation Service manuscript mapping. The soils mapping was done by Patrick D. Collins (Botanist/Reclamation Specialist) using the information supplied by George Cook of the SCS as to the locations, types and depths of soils.

George Cook (SCS) and Richard A. Foster used the pit method to estimate depths and quality of the soil. Detailed pedon are described to depths of 60 inches, or until bedrock, whichever was shallowest. These pits were dug below the mine area, up the canyon where new disturbance will occur, and at previously disturbed areas.

The soils to be saved for reclamation were tested at a approved laboratory using the UDOGM guidelines. The parameters tested were pH, electrical conductivity, saturation percent, particle size, soluble Ca, Mg & Na, Total N, Nitrate-N, Organic carbon, available water capacity, rock fragments above 2mm size, and soil color. Where a high pH was indicated, tests were preformed for Selenium and Boron.

Present and potential uses of the soils of the site have been evaluated based on Soil Conservation Service Soil Survey Interpretation information. The soils have no potential as cropland or pasture land. The soils have also been evaluated for the potential production as rangeland and their capability groups are given.

The soils have been correlated by the SCS. Classifications are based on morphology as described in the field, and to a lesser degree on the analytical data. Where analytical data do not support the field description the soils are classified according to the field description.



8.3 Soil Resource Information for the Mine Plan Area

8.3.1 Soils Identification

The soils at Horizon were initially identified on site. This allowed the consultant to determine slopes, land forms, and vegetation patterns (see Section 8.2). The soil descriptions were compared with recorded characteristics of the soils in adjacent areas and in the official SCS series descriptions. Map units are comprised of soil series and inclusions found within an area to make them site specific. The differences in symbols between the SCS report located in Appendix 8-1 and the new SCS guidelines dated June 1988 used on Plate 8-1, are as follows:

FIA	=	Shupert-Winetti Complex
GIG	=	Curecanti
HIG	=	Senchert
JIB	=	Brycan Loam
DM	=	Mine Dumps (Previous Disturbed Area)
No symbol		Rabbitex

Shupert-Winetti Complex

The Shupert - Winetti complex consists of very deep, well drained, moderately permeable soils on narrow valley and canyon floors. These soils formed in alluvium derived from sandstone and shale. Slope is 1 to 8 percent. Elevation ranges from 4,600 to 7,200 feet but commonly is 5,200 to 6,400 feet. Average annual precipitation is 12 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy, mixed (calcareous), frigid Typic Ustifluvents.

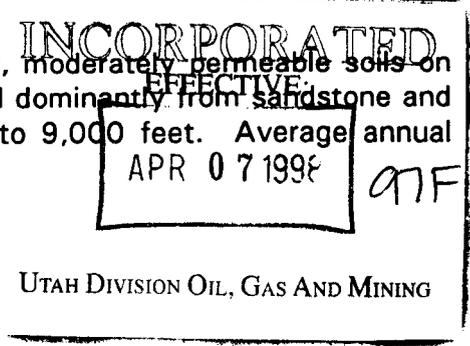
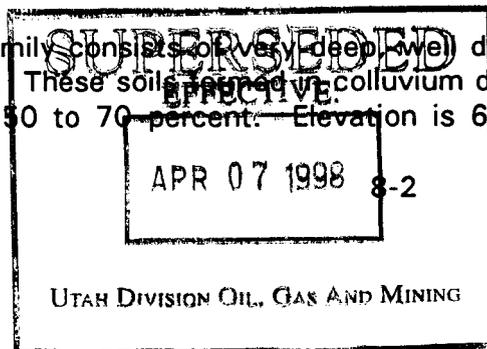
Brycan

The Brycan Series consists of very deep, well drained, moderately slowly permeable soils on alluvium derived from shale and sandstone. Slope is 3 to 8 percent. Elevation is 7,700 to 8,600 feet. Average annual precipitation is 16 to 20 inches, and average annual air temperature is 38 to 45 degrees F.

These soils are fine-loamy, mixed Cumulic Haploborolls.

Curecanti

The Curecanti family consists of very deep, well drained, moderately permeable soils on mountain slopes. These soils formed in colluvium derived dominantly from sandstone and shale. Slope is 30 to 70 percent. Elevation is 6,800 to 9,000 feet. Average annual



precipitation ranges from 16 to 20 inches, and average annual air temperature ranges from 38 to 45 degrees F.

These soils are loamy-skeletal, mixed Typic Argiborolls.

Rabbitex

The Rabbitex series consists of very deep, well drained, moderately permeable soils on mountain slopes and ridgetops. These soils formed in residuum and colluvium derived dominantly from sandstone, shale, limestone, and siltstone. Slope is 15 to 70 percent. Elevation is 7,000 to 9,200 feet. Average annual precipitation range from 16 to 20 inches, and average annual air temperature ranges from 38 to 45 degrees F.

These soils are fine-loamy, mixed Typic Calciborolls.

Senchert

The Senchert family consists of moderately deep, well drained, moderately permeable soils on mountain slopes, plateaus, and ridges. These soils formed in residuum and alluvium derived dominantly from sandstone and shale. Slope is 1 to 50 percent. Elevation is 8,000 to 10,100 feet. Average annual precipitation is 20 to 30 inches. An average annual air temperature is 36 to 38 degrees F. These soils are fine loamy, mixed Argic Pachic Cryoborolls.

A description of the soil sampled in Pits 1 through 7 follow.

Pit #1 - (TP-1) Shupert-Winetti Complex

Fine-loamy, mixed (calcareous), frigid Typic Ustifluvents. Colors are for dry soil unless otherwise noted.

A -- 0 to 6 inches (0 to 15.2 cm); light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate thin plate structure paring to moderate fine subangular blocky; hard, firm, sticky and plastic; common fine, many very fine roots; many fine and very fine random tubular pores; moderately calcareous, lime is disseminated; strongly alkaline (pH 8.5); clear smooth boundary.

C1 -- 6 to 12 inches (15.2 to 30.5 cm); light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate coarse subangular blocky structure, hard, firm, sticky and plastic; few fine, common very fine roots; common fine, many very fine random tubular pore; moderately calcareous, lime is disseminate; strongly alkaline (pH 8.5); clear smooth boundary.

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C2 -- 12 to 26 inches (30.5 to 66 cm); light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; weak coarse and medium subangular blocky structure; hard, firm sticky and plastic; few fine and very fine roots; common fine, many very fine random tubular pore; moderately calcareous, lime is disseminate; strongly alkaline (pH 8.5); clear smooth boundary.

C3 -- 26 to 40 inches (66 to 101.6 cm); pale brown (10YR 6/3) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few fine, common very fine random tubular pores; moderately calcareous, lime is disseminate; strongly alkaline (pH 8.5); clear smooth boundary.

C4 -- 40 to 57 inches (101.6 to 144.8 cm); pale brown (10YR 6/3) loam, very dark grayish brown (10YR 3/2) moist; may fine distinct (10YR 5/8) mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few fine and very fine random tubular pores; moderately calcareous lime is disseminated; strongly alkaline (pH 8.5); clear smooth boundary.

2C -- 57 to 65 inches (144.8 to 165.1 cm); very pale brown (10YR 7/4) loamy fine sand, brown (10YR 5/3) moist; common fine distinct (10YR 5/8) mottles; massive; soft, very friable, nonsticky and non plastic; few very fine random tubular pores; moderately calcareous, lime is disseminate; strongly alkaline (pH 8.5).

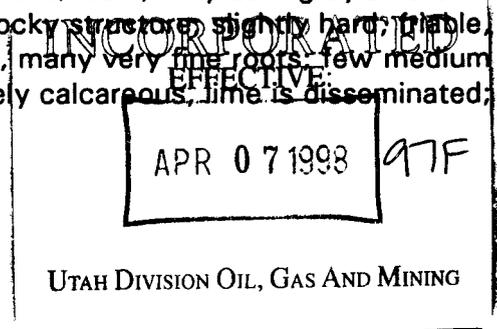
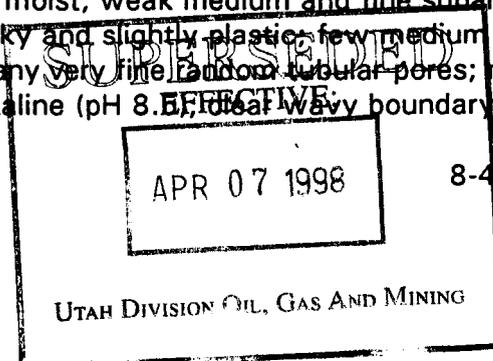
The C2 horizon has thin strata of material like the C# horizon. The C# horizon has thin strata of material like the C4 horizon.

Pit #2 - (TP-2) Shupert-Winetti Complex

Loamy-skeletal, mixed (calcareous), frigid Typic Ustifluvents. Colors are for dry soil unless otherwise noted. Moist colors are darker in the upper three horizons due to the presence of coal. This is a disturbed site.

C1 -- 0 to 6 inches (0 to 15.2 cm); pale brown (10YR 6/3) sandy lam, very dark gray (10YR 3/1) moist; moderate thin plate structure parting to weak fine and very fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few coarse and medium, many fine and very fine roots; few medium and fine, many very fine random tubular pore; moderately calcareous, lime is disseminate; moderately alkaline (pH 8.4); clear smooth boundary.

C2 -- 6 to 19 inches (15.2 to 48.3 cm); pale brown (10YR 6/3) loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure, slightly hard, friable, slightly sticky and slightly plastic; few medium and fine, many very fine roots; few medium and fine, many very fine random tubular pores; moderately calcareous, lime is disseminated; strongly alkaline (pH 8.5); clear wavy boundary.



C3 -- 19 to 34 inches (48.3 to 86.4 cm); light yellowish brown (10YR 6/4) extremely gravelly sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few medium, fine, and very fine roots; few fine, common very fine random tubular pores; 10 percent cobble, 50 percent gravel; moderately calcareous, lime is disseminated; strongly alkaline (pH 8.3); gradual wavy boundary.

C4 -- 34 to 47 inches (86.4 to 119.4 cm); pale brown (10YR 6/3) extremely gravelly loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many fine and very interstitial pores; 20 percent cobble, 50 percent gravel; moderately calcareous, lime is disseminate; moderately alkaline (pH 8.3); gradual wavy boundary.

C5 -- 47 to 60 inches (119.4 to 152.4 cm); light yellowish brown (10YR 6/4) extremely cobbly sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, slightly sticky and slightly plastic; many fine and very fine interstitial pore; 10 percent stone, 55 percent cobble, 10 percent gravel; moderately calcareous, lime is disseminated; moderately alkaline (pH 8.4).

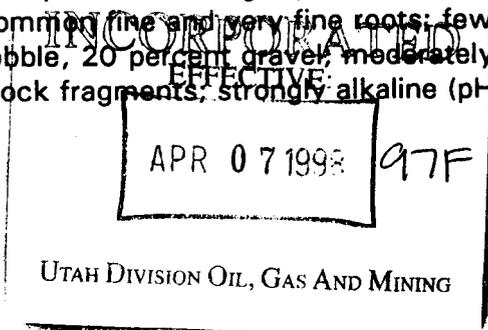
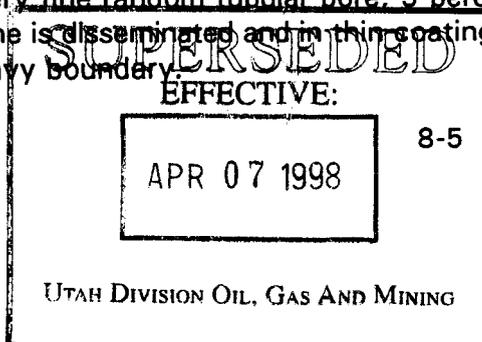
Pit #3 - (TP-3) Rabbitex

Fine-loamy, mixed Typic Calciboroll. Colors are for dry soil unless otherwise noted.

A -- 0 to 5 inches (0 to 12.7 cm); brown (10YR 5/3) gravelly loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure parting to moderate fine and very fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few coarse, common medium, many fine and very fine roots; common medium and fine, many very fine random tubular pores; 25 percent gravel; moderately calcareous, lime is disseminated; moderately alkaline (pH 8.4); clear wavy boundary.

Bk1 -- 5 to 20 inches (12.7 to 50.8); brown (10YR 5/3) gravelly loam, dark grayish brown (10YR 4/2) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse, medium, common fine, many very fine roots; common fine, many very fine random tubular pores; 20 percent gravel; moderately calcareous, lime is disseminated and in thin coatings on rock fragments; moderately alkaline (pH 8.4); gradual wavy boundary.

Bk2 -- 20 to 45 inches (50.8 to 114.3 cm); brown (10YR 5/3) gravelly loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse, medium, common fine and very fine roots; few fine, many very fine random tubular pore; 5 percent cobble, 20 percent gravel; moderately calcareous, lime is disseminated and in thin coatings on rock fragments; strongly alkaline (pH 8.5); clear wavy boundary.



Bk3 -- 45 to 51 inches (114.3 to 129.5 cm); yellowish brown (10YR 5/4) very gravelly loam, dark brown (10YR 4.3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse, medium and fine, common very fine roots; few fine, common very fine random tubular pores; 5 percent cobble, 40 percent thin coatings on rock fragments; strongly alkaline (pH 8.5); clear wavy boundary.

Bk4 -- 51 to 70 inches (129.5 to 177.8 cm); brown (10YR 5/3) gravelly loam, dark grayish brown (10YR 4/2) moist; moderately medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse, medium, fine, and very fine roots; few fine and very fine random tubular pore; 25 percent gravel; moderately calcareous, lime is disseminated and in few fine veins and thin coatings on rock fragments; strongly alkaline (pH 8.5).

This soil is an inclusion in the Rabbitex mapping unit and is found predominantly at the base of steeper slopes.

Pit #4 - (TP-4) Shupert-Winetti Complex

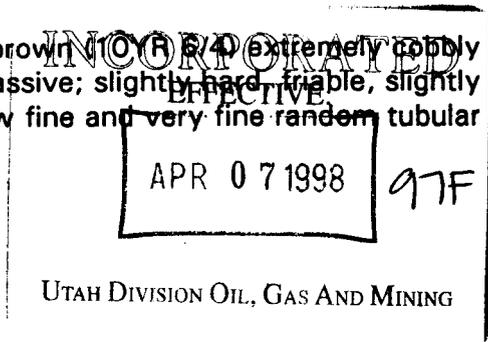
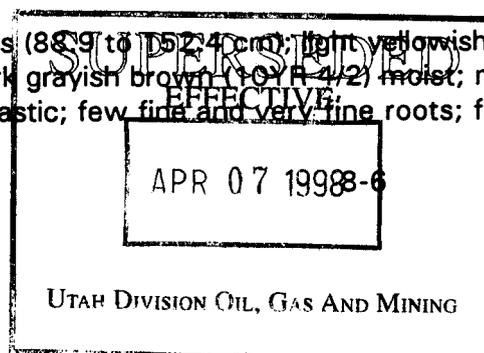
Loamy-skeletal, mixed (calcareous), frigid Typic Ustifluent. Colors are for dry soil unless otherwise noted. Moist colors are darker due to the presence of coal.

A -- 0 to 10 inches (0 to 25.4 cm); pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and fine, many very fine roots; common medium, many fine and very fine random tubular pores; moderately calcareous, lime is disseminated; strongly alkaline (pH 8.5); clear smooth boundary.

C1 -- 10 to 17 inches (25.4 to 43.2 cm); pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, common fine and very fine roots; few medium, common fine and very fine random tubular pore; 10 percent gravel; moderately calcareous, lime is disseminated; strongly alkaline (pH 8.5); gradual wavy boundary.

C2 -- 17 to 35 inches (43.2 to 88.9 cm); pale brown (10YR 6/3) very cobbly loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine, common very fine random tubular pores; 10 percent stone, 15 percent cobble, 15 percent gravel; moderately calcareous, lime is disseminated; strongly alkaline (pH 8.5); gradual wavy boundary.

C3 -- 35 to 60 inches (88.9 to 152.4 cm); light yellowish brown (10YR 6/4) extremely cobbly sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine and very fine random tubular



pores; 10 percent stone, 20 percent cobble, 30 percent gravel; moderately calcareous, lime is disseminated; strongly alkaline (pH 8.5)

Pit #5 - (TP-5) Brycan

Fine-loamy, mixed Cumulic Haploborolls. Colors are for dry soil unless otherwise noted. Less than 5 percent stone and cobbles on the surface.

A1 -- 0 to 8 inches (0 to 20.3 cm); dark brown (10YR 4/3) loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, common fine, many very fine roots; few medium, common fine, many very fine random tubular pores; 5 percent gravel; noncalcareous; moderately alkaline (pH 8.2); clear smooth boundary.

A2 -- 8 to 18 inches (20.3 to 45.7 cm); dark brown (10YR 4/3) gravelly loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium and fine, common very fine roots; common medium and fine, many very fine random tubular pores; 20 percent gravel; noncalcareous; moderately alkaline (pH 8,2); gradual wavy boundary.

A3 -- 18 to 43 inches (45.7 to 109.2 cm); dark brown (10YR 4/3) loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and lightly plastic; few fine and very fine roots; few fine, common very fine random tubular pores; 5 percent gravel; noncalcareous; moderately alkaline (pH 8.2); clear wavy boundary.

C -- 43 to 60 inches (109.2 to 152.4 cm); pale brown (10YR 6/3) very cobbly lam, brown (10YR 4/3) moist; massive slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots few fine and very fine random tubular pores; 20 percent cobble, 30 percent gravel; slightly calcareous, lime is disseminated; moderately alkaline (pH 8.2).

Pit #6 - (TP-6) Shupert-Winetti Complex

Fine-loamy, mixed (calcareous), frigid Typic Ustifluent. Colors are for dry soil unless otherwise noted.

A -- 0 to 5 inches (0 to 12.7 cm); pale brown (10YR 6/3) sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common coarse, medium, fine and very fine roots; common medium, many fine and very fine random tubular pores; moderately calcareous, lime is disseminated; moderately alkaline (pH 8.2); clear wavy boundary.

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C1 -- 5 to 14 inches (12.7 to 35.6 cm); pale brown (10YR 6/3) sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard friable, slightly sticky and slightly plastic; few coarse, medium, and fine, common very fine roots few medium, common fine, many very fine random tubular pores; 5 percent gravel; moderately calcareous, lime is disseminated; moderately alkaline (pH 8.2); clear wavy boundary.

C2 -- 14 to 18 inches (35.6 to 45.7 cm); pale brown (10YR 6/3) silt loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard friable slightly sticky and slightly plastic; few medium and fine, common very fine roots; few medium and fine, many very fine random tubular pores; 5 percent gravel; slightly calcareous, lime is disseminated; strongly alkaline (pH 8.6); clear wavy boundary.

C3 -- 18 to 28 inches (45.7 to 71.1 cm); pale brown (10YR 6/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine, common very fine roots; few fine, common very fine random tubular pore; 40 percent gravel; moderately calcareous, lime is disseminated; strongly alkaline (pH 8.5); gradual wavy boundary.

C4 -- 28 to 48 inches (71.1 to 121.9 cm); pale brown (10YR 6/3) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine, common very fine random tubular pores; 10 percent gravel with thin lenses of 50 percent gravel; moderately calcareous, lime is disseminated; strongly alkaline (pH 8.5); gradual wavy boundary.

C5 -- 48 to 60 inches (121.9 to 152.4 cm); pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine, common very fine random tubular pores; 5 percent gravel; slightly calcareous, lime is disseminated; moderately alkaline (pH 8.4).

Pit #7 - (TP-7) Brycan

Fine-loamy, mixed Cumulic Haploborolls. Colors are for dry soil unless otherwise noted.

A1 -- 0 to 10 inches (0 to 25.4 cm); brown (10YR 5/3) loam, very dark brown (10YR 2/2) moist moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse and medium, common fine and very fine roots; few medium, common fine, many very fine random tubular pores; 5 percent gravel; slightly calcareous, lime is disseminated; moderately alkaline (pH 8.2); clear wavy boundary.

A2 -- 10 to 17 inches (25.4 to 43.2 cm); brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse, medium, and fine, common very fine

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roots; few fine, common very fine random tubular pores; 5 percent gravel; noncalcareous; moderately alkaline (pH 8.2); clear wavy boundary.

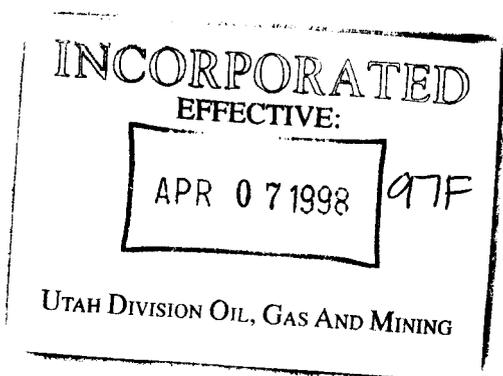
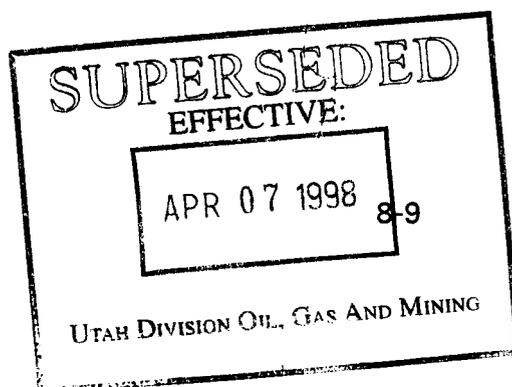
A3 -- 17 to 34 inches (43.2 to 86.4 cm); pale brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; weak medium sub angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse, medium, and fine, common very fine roots; few fine, common very fine random tubular pores; 5 percent gravel; noncalcareous; moderately alkaline (pH 8.2); clear wavy boundary.

C1 -- 34 to 52 inches (86.4 to 132.1 cm); pale brown (10YR 6/3) clay loam, very dark grayish brown (10YR 3/2) moist; massive; hard, firm, sticky and plastic; few fine and very fine roots; few fine, common very fine random tubular pores; noncalcareous; moderately alkaline (pH 8.2); abrupt wavy boundary.

C2 -- 52 to 60 inches (132.1 to 152.4 cm); light yellowish brown (10YR 6/4) clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, sticky and plastic; few very fine roots; few fine and very fine random tubular pores; slightly calcareous, lime is disseminated; moderately alkaline (pH 8.2).

Three soil test pits, TP-40 through TP-42, were excavated in the embankment located southwest of the portals. These test pits were dug to obtain samples of the material contained within the embankment to determine the suitability of the material to be used as backfill. A composite sample was obtained from each of the test pits by first excavating to total depth then obtaining a channel sample from one wall of the pit (if the material was similar throughout the excavation). If distinct units or horizons were observed to be unique to a wall of the excavation, a sample from each unique horizon was obtained and then composited with samples from all horizons observed. The composite samples were sent to Intermountain Laboratories, Inc. of Sheridan, Wyoming for analysis for the parameters listed in the Division's "Guidelines for Management of Topsoil and Overburden", (Leatherwood, 1988). Selected results of the analysis are presented in Table 8-1 and the laboratory analyses data reporting sheets are contained in Appendix 8-1.

Test pit TP-40 was excavated on the east (upstream) face of the south end of the embankment (Plate 8-1). The pit was excavated to eight feet below ground surface. Vegetative cover is very sparse and the area is well-drained. The surface and subsurface is comprised of coal waste and rock fragments. The profile consists of predominantly layered coal debris from previous mining operations.



Profile

0-8' Coal and waste rock (100%); very fine to very coarse fragments of angular to sub-angular coal debris and waste rock, coal waste is very dark brown (10YR 2/2) to black (10YR 2/1), waste rock is very dark brown (10YR 2/2), some wood fragments, trace of pyrite on some of the rock, material is dry to damp, loose.

Test pit TP-41 was excavated on the east (downstream) face of the south end of the embankment (Plate 8-1). The pit was excavated to 16 feet below ground surface. Vegetative is thin and the area is well-drained. The surface and subsurface is comprised of coal waste, rock fragments, and disturbed soil.

Profile

0-1' Coal, dark gray (10YR 4/1) to very dark brown (10YR 2/2), coarse coal fragments with some waste rock, angular to sub-angular coal debris and waste rock, some wood fragments, material is damp, loose.

1-4' Mixed Coal and Soil, Coal as above, Soil is a loam, brown (10YR 4/3), sandy with coal fines, occasional coarse rock fragments, damp, loose.

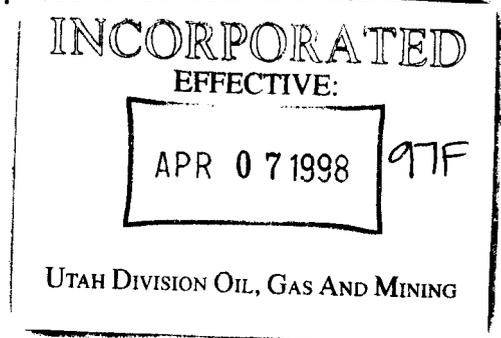
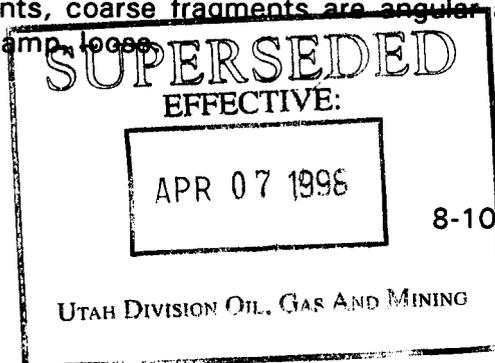
4-6' Mixed Coal and Waste Rock, Coal as above, Waste rock is sandstone and siltstone, angular, gravel to boulder size, some coal fines and soil are present as a matrix, damp, loose.

6-16' Sandy Loam, yellowish brown (10YR 5/4), mixed with some coal fines and coal waste, approximately 20 percent and greater coarse fragments, coarse fragments increase with depth, slightly sticky, slightly plastic, friable, soft to slightly hard, moist, loose.

Test pit TP-42 was excavated on the west (upstream) face of the north end of the embankment (Plate 8-1). The pit was excavated to 12 feet below ground surface. Vegetative cover is moderate and the area is well-drained. The surface is a loam and coal waste mixture and subsurface is comprised of coal waste and rock fragments. The profile consists of predominantly layered coal debris from previous mining operations.

Profile

0-5' Loam with coal fines, very dark gray (10YR 2/2) to black (10YR 3/1), sand to cobble size fragments, coarse fragments are angular and comprised of sandstone and siltstone, material is damp, loose.



5-12' Coal Waste, very dark gray (10YR 2/2) to black (10YR 3/1), includes large fragments of coal, waste rock, wood timbers, and metal pipe, fragment size is sand to cobble, damp, loose.

As described previously, the composite samples obtained from these test pits were analyzed for the parameters listed in Table 6 (Leatherwood, 1988) with the selected results listed in Table 8-1. The results of the analyses indicate that the soil and coal waste characteristics fall within the Division's acceptable range for overburden for the vegetative root zone as listed in Table 2 of the "Guidelines for Management of Topsoil and Overburden" (Leatherwood, 1988). Though the results indicate that the material is acceptable for vegetative growth, the concentration of coal eliminates most of this material from being used as topsoil. This material will be used as backfill in the facilities area. Coal and coal waste material from the embankment will be used as backfill and covered with at least four feet of acceptable backfill material as described in Section 3.3.2.5.

In addition to the soil test pits excavated in the embankment, one soil test pit (TP-43) was excavated in the bottom of the channel formed by Jewkes Creek while another (TP-44) was excavated across from the ruins of the concrete garages (Plate 8-1). These excavations were made to determine the type of soils present in these areas and their suitability as substitute topsoil. In both locations, the soils have been disturbed in the past and covered with materials imported from another location.

A composite sample of the material found in test pit TP-43 was obtained in a similar manner as described for test pits TP-40, 41, and 42. The pit was excavated to a depth of 12 feet below ground surface. The surface was covered with grasses and shrubs.

The material found in TP-43 was not predominantly coal waste, as in the case of the embankment, but was apparently deposited as a the result of mining operations. The material encountered below ground surface appeared to have been deposited by moving water on a slope of at least 10 degrees. The current ground surface is near horizontal. This suggests that the material was deposited on the face of a prograding "delta", perhaps forming in a pond. Following is a description of the soil profile observed in the excavation.

Profile

0-5" Loam with some very fine sands and clay, dark yellowish brown (10YR 4/4), some coal fines mixed with loam, abundant roots, less than 10% rock fragment, slightly sticky and plastic, friable, soft to slightly hard, blocky structure, dry to slightly damp.

5"-7' Sandy loam, dark yellowish brown (10YR 4/4) to very dark gray (10YR 3/1), interbedded with beds up to 12 inches thick of coal fines mixed with occasional roots, less than 10% rock fragments, slightly sticky and plastic, friable, soft, blocky structure,

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occasional cobble size fragment, slightly moist. (Unit is approximately 30% coal fines and appears to have been deposited below a coal washing operation).

7-12' Sandy loam, some gravel, dark brown (10YR 3/3), trace of roots, approximately 15% sandstone and siltstone rock fragments, occasional cobble and boulder size fragments, non-sticky and non-plastic, friable, loose, crumb structure, laminated to thin bedded, sands and gravel are fine to coarse, subangular to subrounded, wet. (Unit appears to be fluvial in origin. Test pit terminated at or near bed rock.)

It is interesting to note that this excavation was located within a few feet of the stream bottom, left open for more than one-half an hour, and did not have significant water in the bottom of the pit prior to back filling.

Test pit TP-44 was excavated near the ruins of a building on the top of the west bank of the drainage formed by Jewkes Creek. It was excavated to a depth of 12 feet below ground surface. It appeared that at least the upper 5 feet of material encountered in this excavation had been disturbed or transported into this area. Soil samples were obtained from 0 to 3 feet, 3 to 5 feet, and 5 to 10 feet below ground surface for analyses. These samples were analyzed for the same parameters as TP-40 through TP-43. The results of the analyses are included in Table 8-1. Following is a description of the soil profile observed in this test pit.

Profile

0-3' Loam, very dark brown (10YR 2/2), some sand and gravel with brick and wood fragments, occasional cobble size rock fragments, rock fragments are less than 10% of total material, abundant roots, slightly sticky and slightly plastic, friable, slightly hard, blocky structure, trace of coal, slightly damp, obviously disturbed.

3-5' Loam, dark yellowish brown (10YR 4/4), some sand and gravel, approximately 15% rock fragments, fragments are sandstone, sand is very fine to fine, subangular, gravels are fine, subangular to subrounded, soil is slightly damp.

5-10' Sandy loam, brown (7.5YR 4/4), interbedded with loam as above, trace of roots, approximately 15 to 20% rock fragments, non-sticky and non-plastic, very friable, loose, crumb structure, sand is very fine to fine, subangular, occasional fine gravel, slightly damp. (Appears to be undisturbed).

10-12' Gravel, coarse to very coarse, a fine to very coarse sand matrix, some cobbles and boulders of sandstone and siltstone, loose, slightly damp.

The results of the analyses of the samples obtained from test pits TP-43 and TP-44 indicate that the soils sampled would be acceptable for use as substitute topsoil, growth medium or backfill. The exception to this would be the layers of coal fines located in TP-43.

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TABLE 8-1
Horizon Coal Soil Analytical Data

Parameter	Units	Division's Acceptable Range ^(a)	Sample Number (Depth Interval, feet)			
			TP-40 (0-7)	TP-41 (0-16)	TP-42 (0-12)	TP-43 (0.5-7)
pH	-	4.5 - 9.0	6.4	7.4	7.2	7.1
EC	mmhos/cm	0 - 15	2.37	0.37	0.83	0.43
Saturation %	-	25 - 80%	36.6	31.2	32.0	35.7
Calcium	mg/kg	-	25.1	1.78	4.33	2.10
Magnesium	mg/kg	-	8.41	1.08	4.50	1.36
Sodium	mg/kg	-	0.58	0.51	0.41	0.58
SAR	-	0 - 12,15	0.14	0.42	0.20	0.44
Nitrate-N	mg/kg	-	1.74	1.18	1.18	1.16
Organic-C	%	-	28.8	16.3	17.2	27.6
Na (exchangeable)	meq/100g	-	0.26	0.25	0.26	0.20
Available Water Capacity ^(b)	%	5 - >10%	6.2	10.3	9.9	6.6
Boron	mg/kg	<5	1.35	1.46	1.31	0.29
Selenium	mg/kg	<0.1	0.02	<0.02	<0.02	<0.02
Acid/Base Potential	tons CaCO ₃ /1,000 tons material	> -5	-1.16	55.6	88.0	27.4
Sample Type	-	-	Coal Waste	Coal Waste	Coal Waste	Overburden
Texture ^(c)	-	-	-	-	-	-

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TABLE 8-1

Horizon Coal Soil Analytical Data (Continued)

Parameter	Units	Division's Acceptable Range ^(a)	Sample Number (Depth Interval, feet)		
			TP-44 (0-3)	TP-44 (3-5)	TP-44 (5-10)
pH	-	4.5 - 9.0	6.9	7.3	7.5
EC	mmhos/cm	0 - 15	0.35	0.31	0.41
Saturation %	-	25 - 80%	33.4	32.3	27.1
Calcium	mg/kg	-	1.87	1.51	2.24
Magnesium	mg/kg	-	0.57	0.47	0.55
Sodium	mg/kg	-	0.56	0.68	0.95
SAR	-	0 - 12,15	0.51	0.68	0.80
Nitrate-N	mg/kg	-	1.04	0.46	0.76
Organic-C	%	-	4.8	1.8	1.2
Na (exchangeable)	meq/100g	-	0.21	0.25	0.29
Available Water Capacity ^(b)	%	5 - >10%	11.8	11.4	11.6
Boron	mg/kg	<5	0.80	0.92	0.39
Selenium	mg/kg	<0.1	<0.02	<0.02	<0.02
Acid/Base Potential	tons CaCO ₃ /1,000 tons material	> -5	2.20	112.0	93.3
Sample Type	-	-	Overburden	Overburden	Overburden
Texture ^(c)	-	-	L	L	L

(a) Leatherwood and Duce, 1988
 (b) USDA, 1953
 (c) Texture: LS - loamy sand, SE - sandy loam, L - loam

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8.3.2 Soil Series Descriptions

Disturbed Land

The disturbed area consists of generally deep, nearly level to nearly vertical, moderately well-drained materials. The fill materials are derived from sandstone, shale, and coal from previous mining operations. The fill material comprise most of the proposed disturbed area. The native vegetation has been previously disturbed in the mine area.

The available water capacity is moderate to low and permeability is moderate. The mean annual air temperature ranges from 36 degrees to 45 degrees F. and the frost free period is 60 to 120 days.

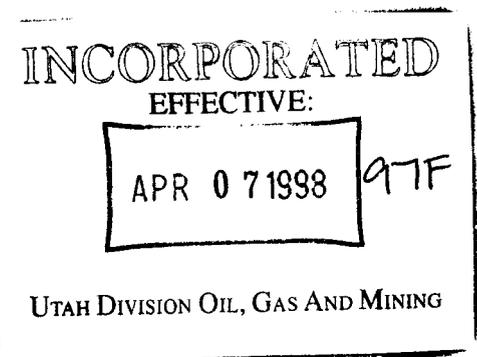
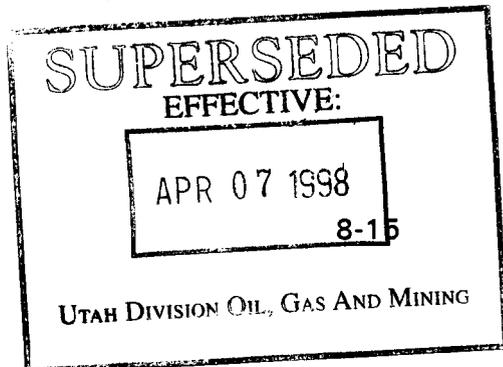
Soils are identified by four categories (FIA, GIG, HIG, JIB) and are identified on Plate 8-1 and in the text as such. Depths and types of soil were identified by SCS. The topsoil/growth medium to be saved for reclamation is also identified by category (see Section 8.2). A complete survey of the soil area was completed on November 3, 1990 and the results were incorporated into this chapter. The majority of the proposed disturbed area was previously used as a mine yard, making it difficult to determine the amount of salvageable topsoil or substitute topsoil.

Mapping Legend

The following is a list of the soil symbols and mapping units which appear in the legend on the soils maps and elsewhere in this permit.

Soil Symbol	Soil Mapping Unit Name
FIA	Shupert-Winetti Complex - 0 to 2% slopes
GIG	Curecanti - Very bouldery loam, 55-65% slopes
HIG	Senchert - Silt loam, 50-70% slopes
JIB	Brycan - 4-6% slopes
DM	Mine Dumps - Previous Disturbed Areas
No symbol	Rabbitex - Fine loamy, mixed Typic Calciborolls

The additional surface soil sampling points on Plate 8-1 are from a survey done by George Cook, Earl Jensen and Gary Moreau for the C & W Coal Producers (Appendix 8-1).



8.3.3 Present and Potential Uses - Crops and Pasture Lands

The SCS has determined that there are no prime farmlands of statewide importance, or unique in the permit area (see Figure 8-1). None of the soils mapped at the site have potential for the growth of crops or pasture land.

Rangelands

The soils of the area have been used as rangeland in the past. Data on predicted forage production for rangeland soils for various sites are available from the SCS (Section 9-9). The principle limitations are erosion and shallowness, according to the SCS the soils cannot support cultivated crops. The soils incapability have very severe limitations thus restricting the use of the land largely to grazing, woodland or wildlife.

8.4 Prime Farmland Investigation and Determination

On August 14, 1990, Blue Blaze Coal Company requested the SCS (Price, Utah office) review the soils within the mine area to determine if any soils qualified as prime farmland. The State Soil Scientist determined there were no soils classified as prime farmlands in the permit area (see Figure 8-1).

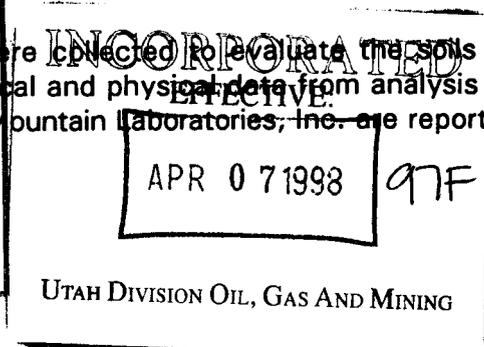
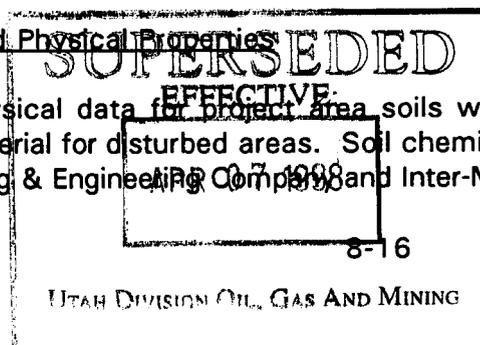
8.5 Physical and Chemical Properties of Soils and Results of Analysis

The criteria for evaluating soil as a plant growth media are given in Table 8-2. The criteria include sodium absorption ration (SAR), electrical conductivity or salinity (EC), toxic materials, soil reaction (pH), available water hold capacity (AWMC), erosion factor (K), wind erosion group, texture and percent coarse fragments.

Criteria are given for good, fair or poor sources of reconstruction material (Table 8-2). A good rating means vegetation is relatively easy to establish and maintain, the surface is stable and resists erosion, and the reconstructed soil has good potential productivity. Material rated fair can be vegetated and stabilized by modifying one or more properties. Top dressing with better material or application of soil amendments may be necessary for satisfactory performance. Material rated poor has such severe problems that revegetation and stabilization is very difficult and costly. Top dressing with better material may be necessary to establish and maintain vegetation (USDA, 1978).

Soil Chemistry and Physical Properties

Chemical and physical data for project area soils were collected to evaluate the soils as reconstruction material for disturbed areas. Soil chemical and physical data from analysis by Commercial Testing & Engineering Company and Inter-Mountain Laboratories, Inc. are reported



Chapter 8, Soils Resources
Horizon Coal Corporation



United States
Department of
Agriculture

Soil
Conservation
Service

PO Box 11350
Salt Lake City, UT 84147

September 12, 1990

William R. Skaggs
Blue Blaze Coal Company
PO Box 784
Price, UT 84501

Dear Mr. Skaggs:

In response to your request August 14, 1990, we have made a review of Sections 7, 8, 17, 18, and 20, T. 13S., R8E., SLM for Important Farmlands determination.

None of these areas qualified as Important Farmland soils: steep slopes, stoney, or bouldry surfaces and soil disturbance from previous construction work are factors that eliminate these sects from categories of Important Farmlands.

Sincerely,

FERRIS P. ALLGOOD
State Soil Scientist

cc:
Price Field Office/Jan Anderson



11/25/90

The Soil Conservation Service
is an agency of the
Department of Agriculture

FIGURE 8-1
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TABLE 8-2

Soil Reconstruction Material for Disturbed Areas

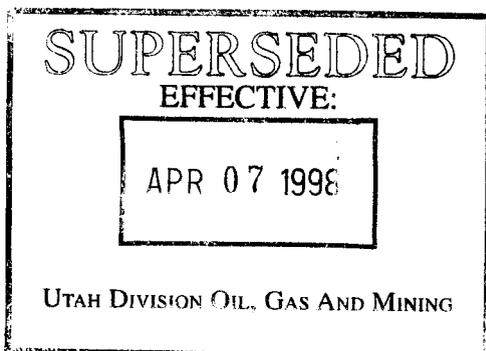
Property	Limits			Restrictive Feature
	Good	Fair	Poor	
Sodium Adsorption Ratio (SAR)	< 5	5 - 12	> 12	Excess Sodium
Salinity (mmhos/cm)	< 8	8 - 16	> 16	Excess Salt
Toxic Materials	Low	Medium	High	Toxicity
Soil Reaction (pH) ^a	5.6 - 7.8	4.5 - 5.5	< 4.5 ^b	Too Acid
Soil Reaction (pH)	7.9	7.9 - 8.4	> 8.4	Excess Lime
Available Water Capacity (IN/IN) ²	> .10	.05 - .10	< .05	Drought
Erosion Factor (K)	< .37	> .37	---	Erodes Easily
Wind Erod. Group	3	3	1, 2	Soil Blowing
USDA Texture	---	SCL, CL, SICL	C°, SIC°, SC	Too Clayey
USDA Texture	---	LCOS, LS, LFS, LVFS	COS, S, FS, VFS	Too Sandy
Coarse Frag. (WTPCT) 3-10 in. (7.6-25.4 cm) 10 in. (25.4 cm)	< 15 < 3	15 - 35 3 - 10	> 35 > 10	Large Stones Large Stones

^a Layers with high potential acidity should be rated "Poor - Too Acid"

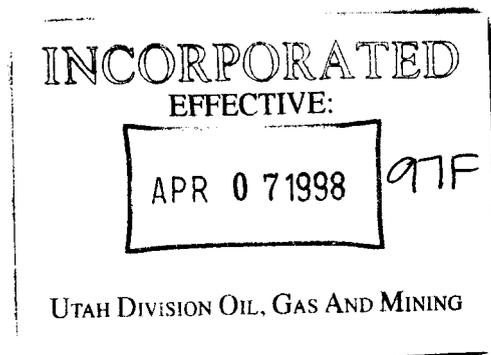
^b Rate "Fair - Too Acid" if found deeper than 40 inches.

^c If in kaolinitic family, rate one class better if experience confirms.

From National Soil Handbook, NSH - Part II [403.6(2)], 1978 and Part 603 (603.03-3(e)(3)), 1983.



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in Appendix 8-1. The parameters tested were under the UDOGM guidelines; pH, electrical conductivity, saturation percentage, particle size, soluble Ca, Mg & Na, sodium absorption ratio, Total N, Nitrate-N, Organic carbon, available water capacity, rock fragments, and soil color. If the pH ran high the samples were tested for Selenium and Boron.

Suitability as a Source Material for Reclamation of Disturbed Lands

Appendix 8-1 contains a chemical evaluation of the soils in both the undisturbed area and the area to be redisturbed. The soils are rated as good, fair or poor sources for reconstruction material. The overall rating given for each horizon is the rating for the most limiting criteria, and no horizon can be rated better than an overlying horizon. Vegetation is difficult to establish on soils with high SAR which indicates potential instability of water transmission problems (USDA, 1978). All of the soils of the site were rated good for SAR.

Electrical conductivity is a measure of soil salinity. Excessive salts restrict plant growth, create problems in establishing vegetation and therefore also influence erosion and the stability of the surface (USDA, 1978). All of the soils of the site were rated good for EC.

Excessively high or low pH causes problems in establishing vegetation and as a result influences erosion and stability of the surface (USDA, 1978). The substratum of the soils are rated good for pH.

The AWHC also is important in establishing vegetation. Soils with low available water capacity may require irrigation for establishment of vegetation (USDA, 1978). AWHC was estimated based on field texture and percent coarse fragments (U.S. Forest Service, 1974). The soils are rated fair to good for AWHC.

The stability of the soil depends upon its erodibility by water and wind and its strength. Water erodibility is indicated by the K factor; wind erodibility is rated according to the wind erodibility group. K values for soils of the project area are from the best data available in the SCS Soil Survey Interpretation Records (USDA, 1978). Soils of the site are rated good for erodibility. Wind erodibility is based on SCS Soil Survey Interpretation Records for the surface horizons.

Wind erodibility data is available for only the surface soils of the site (USDA, 1978). The surface layers of the Pathead and Curecanti soils are rated good for wind erodibility.

USDA texture also influences available water capacity and erodibility by wind or water. Texture influences soil structure, consistence, water intake rate, runoff, fertility, workability, and trafficability. Potential slippage hazard is related to soil texture and although other factors also contribute, the ratings of soil texture represent one important factor (USDA, 1978). Soil texture for soils of the site are rated fair to poor, but are generally not considered

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the limiting factors. The fill textures for soils of the site were described in the field and the evaluations are based on the field determinations.

Coarse fragments influence the ease of excavation, stockpiling and respreading, and suitability for the final use of the land. A certain amount of coarse fragments can be tolerated depending upon the size and intended use of the reclaimed area.

Test pit 1 was determined by SCS to be unsuitable for salvage. A summary of TP-1 characteristics are summarized in a table in Appendix 8-1.

Salvageable topsoil/growth medium will be placed in a stockpile. The soil will be spread over a large area so that the application of soil nutrients can be carefully controlled. The stockpile will be surveyed to verify that the quantity of soils contained are sufficient for reclamation.

Topsoil/growth medium which meets the UDOGM suitability criteria will be salvaged from all areas within the permit area. Horizon commits to excavating the A or E horizon for the Curecanti Family and Senchert Series in accordance with the profile descriptions located in the USDA\SCS Soil Survey for the Carbon County Area, Utah. The applicant will submit as-built surveys of the completed subsoil and topsoil stockpiles. The surveys will include: volume of material, maximum and minimum elevations and slopes, cross sections, and all other pertinent dimensions. Based on the survey information topsoil and subsoil mass balance tables will be amended.

All topsoil/growth medium to be used for reclamation will be tested according to the UDOGM soil guidelines, including any imported topsoil/growth medium. The requirements of regulation R645-301-233 will be met in the event the mass balance calculations indicate a topsoil\subsoil deficiency.

Depths of Suitable Topsoil Available for Reclamation

Table 8-3 presents the topsoil/growth medium recovery calculations, soil types, as well as the recommended depth of stripping. Volumes of soil available for storage are also indicated. Figure 8-2 shows the location of each recovery area.

Much of the site is mapped as disturbed land. The fill material has variable properties, but the main restrictive features are coarse fragments and slope. The chemistry of the fine earth fraction is fair. The fill material is the only readily available reconstruction material in the mapped area. Included in the map unit DM (Mine Dumps) are areas of excessive large stones, rock outcrops, coal and rock dumps from previous mining. The coal and coal waste material from this areas (specifically the embankment at the mouth of Portal Canyon) will be handled as outlined in Section 3.3.2.3.

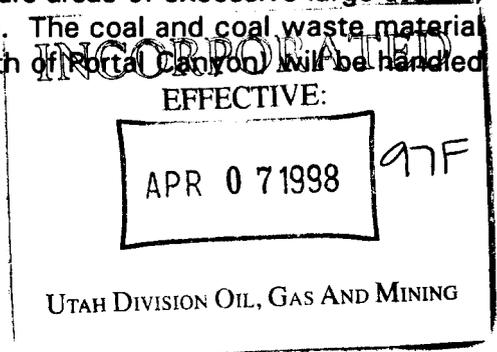
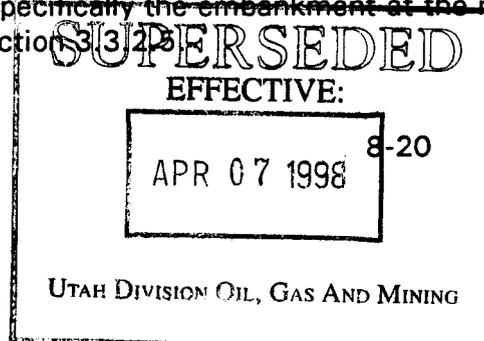


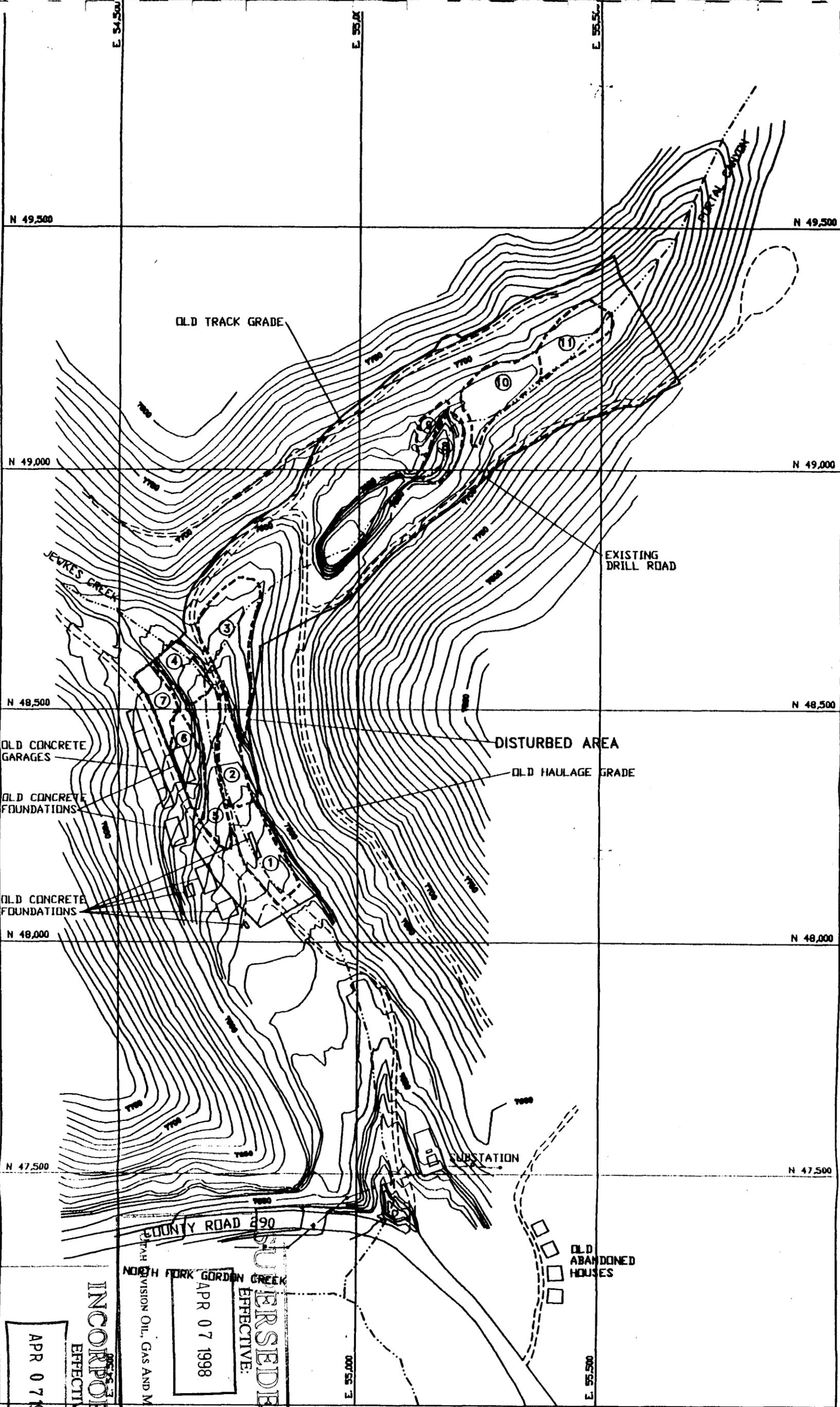
TABLE 8-3
 Topsoil/Growth Medium Calculations

Recovery Area No.	Soil Type	Depth To Be Removed (Feet)	Volume (CY) ^A
1	DM	1.0	513
2	GIG	2.0	704
3	JIB	3.0	3000
4	DM	3.0	1173
5	DM	1.5	773
6	DM	3.0	1280
7	GIG	4.5	1600
8	FIA	2.5	667
9	DM	3.0	227
10	FIA/JIB	4.0	2133
11	JIB	3.0	1600
Total			13,670 CY

^A All topsoil/growth medium to be stored at the top of Portal Canyon.

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LEGEND

- (1) Growth Medium Removal Locations
- Unimproved Road
- Improved Gravel Road
- - - Streams
- P - Power Line



NO.	DATE	BY

FIGURE 8-2
GROWTH MEDIUM REMOVAL LOCATIONS
HORIZON No. 1 MINE
 HORIZON COAL CORPORATION
 P.O. BOX 2880
 WISE, VIRGINIA 24278

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All disturbance was conducted prior to enactment of regulations requiring salvaging of topsoil. Due to the already disturbed area a limited amount of the original topsoil/growth medium can be salvaged for storage.

Soils will be removed to the proper depth by use of an island method and replaced by the use of wooden stakes with depth marks on them to assure equal distribution.

Sampling of soil test pits prior to disturbance within the proposed disturbed area have provided positive indications that the soils in the area are capable of sustaining vegetation. Soils which lack the ability to sustain vegetation will be covered with topsoil/growth medium in sufficient depth to sustain and support vegetation. Horizon commits to cover any toxic-or acid-forming material with four feet of topsoil/growth medium prior to reclamation revegetation.

8.6 Use of Selected Overburden Materials or Substitutes

It is anticipated that there will be enough topsoil/growth medium stockpiled to re-distribute over the disturbed area (see Section 8.3.2). Contaminated material will be removed from the site and disposed of properly before topsoil/growth medium is replaced.

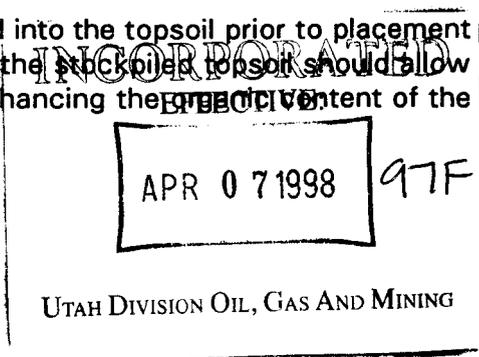
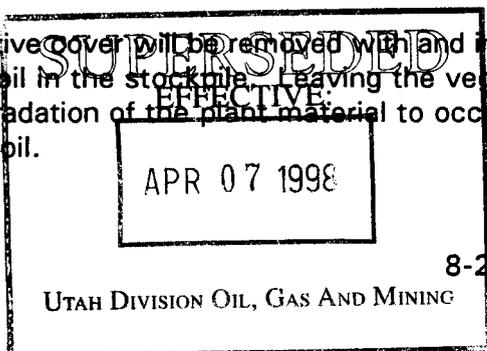
8.7 Soil Plan for Removal, Storage, and Protection

It is proposed to remove the topsoil/growth medium using the island method to insure that the proper thickness of the soil is removed. At the time of soil removal a professional soil scientist or equivalently qualified individual will be on site to insure proper separation and stockpiling of topsoil (A and/or B horizons) and subsoil (B and/or C horizons) and to delineate phase and inclusion variation and salvage depths.

In areas of disturbance, available topsoil/growth medium will be salvaged and stored. The exception will be the riparian area where only topsoil (A horizon) will be salvaged due to the in-place soil's value for reestablishment of riparian vegetation during reclamation. Topsoil/growth medium salvaged from the riparian area will be dried (when necessary) prior to inclusion in the topsoil stockpile.

The excavation of the sediment pond will likely occur where remnants of a building's foundation exists. The size of this foundation is unknown. Therefore, the quantity of topsoil/growth medium available for salvage is unknown. All available topsoil/growth medium will be salvaged during the excavation of the sediment pond and stored in the stockpile.

The vegetative cover will be removed with and incorporated into the topsoil prior to placement of the topsoil in the stockpile. Leaving the vegetation in the stockpiled topsoil should allow natural degradation of the plant material to occur, thus enhancing the organic content of the stored topsoil.



The soil will be transported to the topsoil storage area shown on Plate 3-1. The soil will then be contoured at a rate of not more than 2:1 (see Section 8.8). Mulch will be applied as outlined in Section 3.5.5.3. The soils will be tested and fertilized with an organic material to insure the interim revegetation will succeed. The topsoil stockpile will be seeded using the seed mix listed in Table 3-2 for temporary reclamation. Signs will be placed in this area indicating "Topsoil Storage". If necessary, the area will be fenced to prevent livestock from entering the area. A berm will be placed around the stockpile to prevent runoff from the storage piles entering the water courses in the mine area.

Trash, concrete, and debris will be hauled to a properly licensed disposal facility as it is removed from the mine site during topsoil/growth medium removal. The majority of the debris will be loaded directly into trucks and hauled from the site. On occasion debris will be stored until a truckload is collected, there will be not permanent storage on site for the debris collected during topsoil/growth medium removal.

8.8 Plans for Redistribution of Soils

Deep scarification of overburden and compacted areas (of no less than 12" depth), will be accomplished to ensure good overburden and redistributed topsoil contact to prevent slippage. The regraded material will be topographically conformed to the relative environmental conditions, which will be approximate to the premining topography with the highwalls being eliminated.

Topsoil/growth medium will be placed over the reclaimed areas as illustrated on Plate B, Appendix 8-1 at a thickness of approximately 20 inches. The thickness of the topsoil/growth medium is based on the total available medium divided by the total area to be reclaimed within the disturbed area. As shown on Plate B Appendix 8-1, not all of the area within the disturbed area boundary will actually be disturbed under current mining plans (disturbed area 9.15 acres and areas to be reclaimed 5.49 acres). If disturbance does occur in these areas, the soils will be salvaged as required by this M&RP. Soils will be placed to aid in the achievement of the reclamation groundcover success standards described in Section 9.8.

Soil will be redistributed using the wooden stake method, where a stake is marked to the depth of fill (estimated at 12"), then the soils will be added to accomplish that depth. The soil will then be harrowed to break up the cloddy surface and scarify to a depth of 18 inches (see Section 3.5.5.1). The regraded soils surface roughness will be maximized by pitting and gouging. Particular care will be taken not to compact soils placed in the riparian area.

The soil will then be sampled as stated in Section 8.9 to determine needed fertilization levels. The area will then be fertilized as required and mulched (Section 3.5.5.3). Seeding will then commence using the final reclamation seed mix listed in Table 3-3. Erosion control matting will be used where the slope grades are 2 1/2H:1V or steeper.

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During reclamation, salvaged riparian soil (i.e., the 100-foot extension of Culvert UC-3) will be placed in the floodplain area of Jewkes Creek beginning at the upstream end. The riparian soil will be placed at a depth of 20 inches. The soil will be used in the floodplain areas until the stockpile has been depleted. The locations of the floodplains are shown on Plate 3-7.

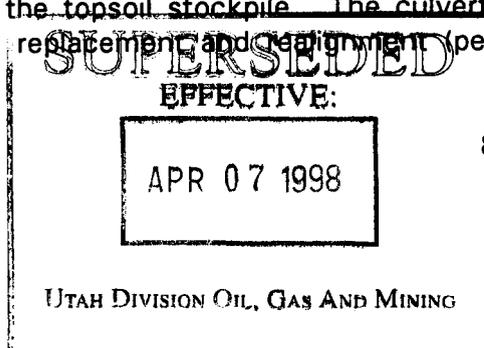
8.8.1 Resoiled Areas

During 1997, various areas and slopes within the disturbed area received topsoil as outlined on Appendix 8-1, Plate A. The soil was distributed, seeded, fertilized, and stabilized as described in Section 3.5.1. The resoiled areas were seeded with Seed Mix No. 1, mulched with a wood fiber, fertilizer, and tackifier. The seeding mixture was intended to protect and enhance the soil during the winter (1997 - 1998). As currently planned, the majority of the resoiled areas will be retained and not redisturbed except to receive seed, mulch, and fertilizer (see Plates 3-7 and 8-1B).

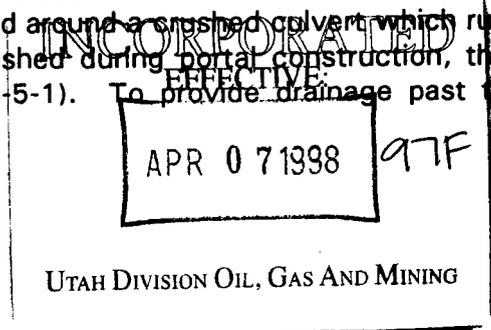
Within portions of Section 17, Township 13 South, Range 8 East are locations which were previously disturbed by mining operations in the early to mid 1900's. Due to the preferences of the landowner (Hidden Splendor Resources, Figure 4-1) many of these disturbances/areas have been cleared of debris including concrete, metal, mine waste, masonry, and coal refuse. Hidden Splendor Resources requested of Carbon County that the topsoil/growth medium be salvaged during realignment of the Consumers/Clear Creek county road in Jewkes Canyon. Once the areas were cleared the landowner contracted with a construction company to grade selected areas and cover the areas with topsoil for eventual reseeded. Hidden Splendor Resources requested a recommendation for the depth of topsoil/growth medium to be placed from an environmental consulting firm. The firm suggested the depth of 11 inches as committed to by Horizon Mine in their approved permit. The Hidden Splendor Resources contractor spread between 10 - 12 inches of soil on the resoiled areas. The locations within the disturbed area which were resoiled by the landowner are designated on Plate A within Appendix 8-1.

It is important to note that at several locations within the area currently owned by Hidden Splendor Resources, coal waste was buried as part of at least one UDOGM Abandoned Mining Lands (AML) project. These projects were completed prior to the work performed by the landowner in 1997.

With permission from the UDOGM Price office, a portion of the stockpiled topsoil/growth medium salvaged during mine construction has been subsequently placed on the hillside designated as Area D on Plate A of Appendix 8-1 to protect the soil from contamination and compaction. This material was removed from above and around a crushed culvert which runs through the topsoil stockpile. The culvert was crushed during portal construction, thus requiring replacement and realignment (per N97-26-5-1). To provide drainage past the



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crushed culvert, a ditch was dug to transport water from the exposed end of the intact portion of the culvert to ditch DD-1.

Culvert UC-2 was installed within the topsoil stockpile. Fill material was not used during the original installation of UC-2 within the topsoil stockpile nor was it used during culvert repair and realignment.

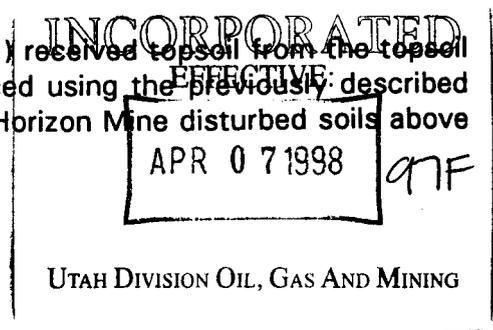
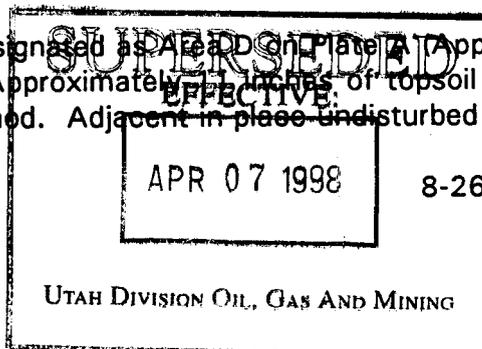
Protection of the resoiled area will be achieved by the reestablishment of vegetation and by excluding redisturbance. Other methods of protection could include signing, barriers and erosion control. To assist in the protection of the slope in Portal Canyon which parallels the coal stockpile, concrete barriers (jersey) will be placed at the bottom of the slope to prevent equipment from accessing the slope and as a boundary for the bottom of the coal stockpile. Should the resoiled areas adjacent to the coal loading facilities become impacted with coal to the extent that vegetation is impaired, alternate methods will be implemented (such as vacuuming).

During recontouring of the HZ-95-3 well road (Area A, Plate A Appendix 8-1) the in-place soils below the road cut were disturbed by earthmoving equipment. These soils are comprised of both undisturbed and pre-Horizon Mine disturbed soils. No topsoil was placed on these in-place soils but they were fertilized and reseeded after recontouring was completed. Similarly, in-place soils above the portals were disturbed during portal construction. These soils have also been reseeded. The soils disturbed during construction of the portals and recontouring of the HZ-95-3 access road were seeded in 1997 at the time the adjacent resoiled areas were seeded.

During mine construction in 1996/1997 and after the removal of topsoil/growth media, Mr. Brad Derrick, P.E. determined that the Portal Canyon pad area was 6 to 8 feet higher in elevation than the portal openings. As a result of this discovery, the pad area was regraded in 1997 and the materials were distributed to various locations within the disturbed area boundary. Contours on Plate A within Appendix 8-1 reflect the pad regrading and placement of the soils.

Soils within the area labeled on Plate A (Appendix 8-1) as "unsalvaged hillside" were initially part of the volume of soils planned for salvage during final reclamation. However, the hillside blends with the adjacent area and much of the pre-Horizon Mine vegetation still remains in place. Areas on this hillside that were disturbed during construction were reseeded. Therefore, Horizon recommends it remain intact and has not included the volume of potential topsoil from this hillside in it's 1997 topsoil/growth media calculations.

The area designated as Area DD on Plate A (Appendix 8-1) received topsoil from the topsoil stockpile. Approximately 12 inches of topsoil was placed using the previously described "stake" method. Adjacent in-place undisturbed and pre-Horizon Mine disturbed soils above



Area D were disturbed by machinery during the placement of topsoil. The in-place soils were graded where necessary to blend with the surface contour of the topsoiled area. The entire area, including the in-place and topsoiled areas, was fertilized and seeded.

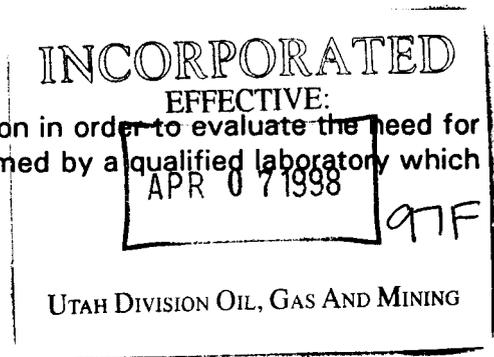
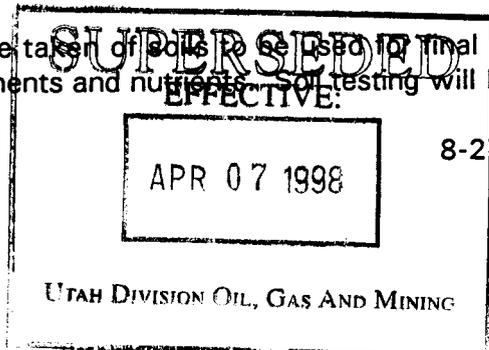
The Topsoil Stockpile table provided in Appendix 8-1 was created using the following information.

- 1) The contours of Portal Canyon from a 1984 AML map were used to determine the area available for topsoil storage prior to placement of salvaged topsoil/growth medium. A subsequent survey of the canyon performed in 1996 was unusable.
- 2) The topsoil stockpile was surveyed in May of 1997 and again in September/October 1997. Surveyed data was compared to AML data and areas were calculated using AUTOCAD™ computer software.
- 3) The area designated to receive topsoil from the topsoil stockpile (Area D ,Plate A Appendix 8-1) was measured. The quantity of topsoil placed was calculated by multiplying the area by the depth of soil placed. Approximately 11 inches of topsoil was placed.
- 4) Topsoil placed by Hidden Splendor Resources within the disturbed area boundary was calculated by multiplying Areas A, B, and C by the depth of 11 inches. The placement of soil was accomplished by driving wooden stakes into the surface of these areas, marking on the wooden stakes a point 11 inches above the in-place soil, and placing the imported to the mark on the stake.

To protect the resoiled areas from erosion, the operator has taken steps to reduce the effects of runoff on these areas. Specifically, the areas that were resoiled were roughened with either the tracks of a dozer or a trackhoe prior to mulching and reseeding. After roughening was completed, a hydoseed mixture was applied the soil surface. The mixture included long fiber mulch with a tackifier and was applied to the surface at a rate intended to form a significant blanket over the soils. This blanket of seed and mulch is intended to protect the roughened soil surfaces from the formation of rills, gullies, and damage to soil and germinating seed from rain drop strikes. Since the watersheds above the resoiled areas generally do not discharge significant runoff (i.e. limited area and good vegetative cover), diversion berms and ditches were not constructed. The operator will maintain the resoiled areas by filling rills and gullies and reseeding when necessary until vegetation is established.

8.9 Nutrients and Soil Amendments

Tests will be taken of soils to be used for final reclamation in order to evaluate the need for soil amendments and nutrients. Soil testing will be performed by a qualified laboratory which



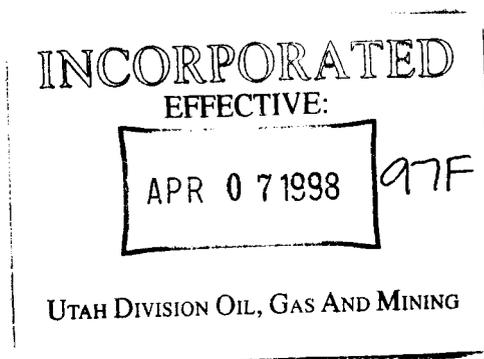
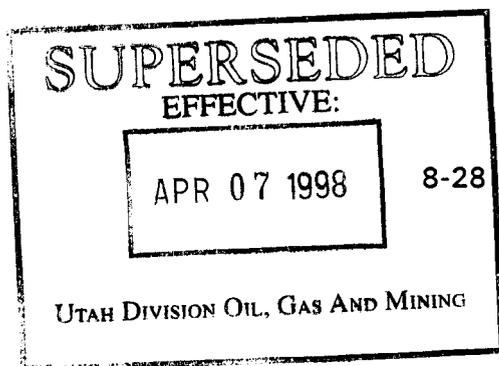
uses accepted analytical procedures (UDOGM soil guidelines). The soils chosen for sampling will be based on previous analysis, affected soil series type, postmining land use, and the postmining vegetation ecosystem. Twenty sub-samples per acre will be taken at 12 inch depths then combined, 5 samples will be taken from the combined sub-samples and send to a qualified laboratory for testing. The tests to be performed will be pH, electrical conductivity, sodium absorption ratio, texture, nitrogen, organic content, phosphorus, potassium, available water capacity, and percent rock fragments, in order to determine needed fertilization levels. Commercial organic fertilizers will be added to replenish soil nutrients and to enhance successful revegetation. The soil nutrient and amendments plan will also follow the Divisions Guidelines for management of topsoil and overburden for underground and surface coal mines.

8.10 Effects of Mining Operations on Soils, Nutrients and Amendments

The previously disturbed land which has been impacted by mining operations has some inherit problems. These problems include large stones and compacted zones. The large stones will be removed by standard earth moving equipment and/or commercial rock-picker implements. Compacted zones will be eliminated by deep chiseling, prior to final reclamation. See Section 8.9 for nutrients and soil amendments.

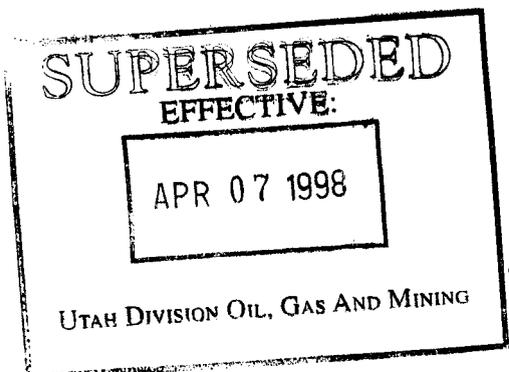
8.11 Mitigation and Control Plans

No additional surface disturbance involving soils will be required for the surface facilities. Therefore, the stripping and stockpiling of soils will be the soils saved from the previously disturbed areas.

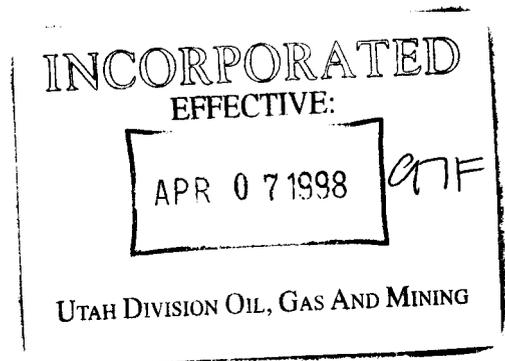


8.12 References

- Black, C.A. 1965. Methods of Soil Analysis. American Society Agronomy No. 9 parts 1 and 2. Madison. Wisconsin. 1572 pgs.
- Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.
- USDA, Soil Conservation Service. Soil Survey Staff 1975. Soil Taxonomy - a basic system of soil classification for marking and interpreting soil surveys, USDA Agricultural Handbook No. 436.
- USDA, 1978 Soil Conservation Service, National Soils Handbook (Compendium of SCS in-house memos, various dates) Part II (403.6[a]).
- USDA, 1983 Soil Conservation Service, National Soils Handbook (various dates) Part 603 Application of Soil Information, Part 603 [403.03-3(e)(3)]
- USDA, Soil Survey Staff, 1951, Soil Survey Manual, USDA Agricultural Handbook No. 18.
- USDA, Soil Survey Staff, 1953, Saline and Alkali Soils, USDA Agricultural Handbook No. 60, page 111.
- USDA, Forest Service, 1974; Branch of Soils, Division of Watershed Management, Rocky Mountain Region, Guidelines for Making Soil Interpretations.
- USDA, Soil Conservation Service, June 1988, Soil Survey of Carbon Area, Utah.

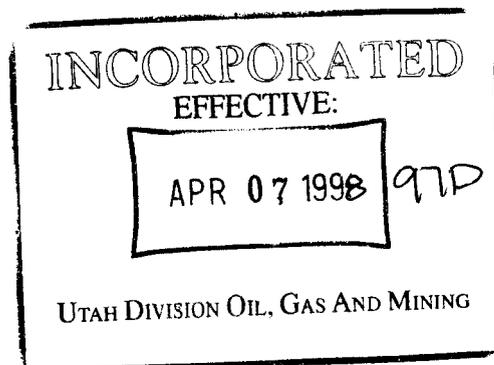
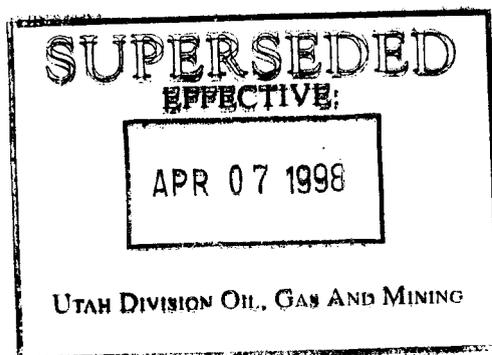


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APPENDIX 8-1

SOILS DATA



HIDDEN SPLENDOR RESOURCES, LTD.

50 West Liberty Street, Suite #880

Reno, Nevada 89501

(702) 322-0626

Fax: (702) 322-5623

June 30, 1997

KTK Construction Company, Inc.
C/o Denise A. Dragoo
Van Cott, Bagley, Cornwall & McCarthy
50 South Main Street, Suite #1600
Salt Lake City, Utah 84144-0450

Re: Use of topsoil from Hidden Splendor property

Dear Ms. Dragoo:

This letter will serve as an authorization to allow KTK Construction Company, Inc., the right to use topsoil generated from the realignment of Consumer's Canyon Road located on the subject property to make repairs on Hidden Splendor's property. Any remaining topsoil in connection with Horizon Mine Permit No. ACT/007/020 may be used by KTK Construction Company.

Further, Hidden Splendor Resources, Ltd., will allow KTK Construction Company, Inc., and Horizon to conduct and perform any necessary cleanup work and repairs on Hidden Splendor's property that it deems necessary.

If you have any questions regarding this matter, please do not hesitate to contact me.

Very truly yours,

HIDDEN SPLENDOR RESOURCES, LTD.
Alexander H. Walker, Jr.
Alexander H. Walker, Jr.
Chairman of the Board

AHW:mm

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EarthFax

EarthFax
Engineering Inc.
Engineers/Scientists
7324 So. Union Park Ave.
Suite 100
Midvale, Utah 84047
Telephone 801-561-1555
Fax 801-561-1861

November 20, 1997

Mr. Robert Davidson
Reclamation Specialist
State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
1594 West No. Temple
Suite 1210
Salt Lake City, UT 84114-5801

RE: Soil Sampling of Areas A, B, and C, Plate A, Appendix 8-1

Dear Mr. Davidson:

On November 12, 1997, soil samples were obtained from three areas at the Horizon Mine. These areas are designated as Areas A, B, and C on Plate A, Appendix 8-1. These areas had been resoiled with material imported during construction of the county road re-alignment. The purpose of the sampling event was to determine if the soils were suitable as substitute topsoil and growth media for the vegetative root zone. This letter report describes the methods used to obtain the soil samples and the results of the laboratory analysis performed on the samples.

SAMPLING METHODS

As was requested by you, random samples from each area were obtained and composited into one sample that could be considered representative of the soils in each area. To ensure that the samples were taken randomly, a map of each area was generated. The map included a grid pattern set on two-foot centers. Next, a random number table beginning with the number 1 and terminating with the number 500 was generated using Microsoft Excel® computer software. Five pairs of random numbers were selected from the table for Areas A and B and seven pairs of numbers for Area C. Each pair was plotted on the area grid pattern using one number to represent an X-axis point and the other number to represent a Y-axis point. The location of the selected points are illustrated on Plate A, Appendix 8-1.

On November 12, 1997, samples were obtained from each of the randomly selected points in each of the three areas. The samples were obtained using a 12-inch long 4-inch diameter stainless steel bucket auger. Care was taken to obtain the same volume of soil at the same depth intervals at each of the locations within the three areas. After obtaining the sample, the soils were placed in a five gallon plastic bucket and thoroughly mixed. A representative portion of the bulk sample was obtained placed in a Ziplock® bag, and the bag appropriately labeled. This sampling process was

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repeated in each area. The three samples were sent to Inter-Mountain Laboratories, Inc. in Sheridan Wyoming via Federal Express for analysis.

SAMPLE ANALYSIS

The composited samples were analyzed for the following parameters:

- pH
- Electrical Conductivity
- Saturation
- Calcium
- Magnesium
- Sodium
- Sodium Absorption Ratio
- Coarse Fragment, Sand, Silt, Clay percentages
- Texture
- Total Organic Carbon
- Total Sulfur
- Acid/Base Potential
- Potassium
- Phosphorus
- Nitrate-Nitrogen
- Available Sodium
- Exchangeable Sodium
- Total Kjeldahl Nitrogen
- Available Water Holding Capacity

The results of the analysis of each sample are attached to this letter. The attached table summarizes selected results from the analysis.

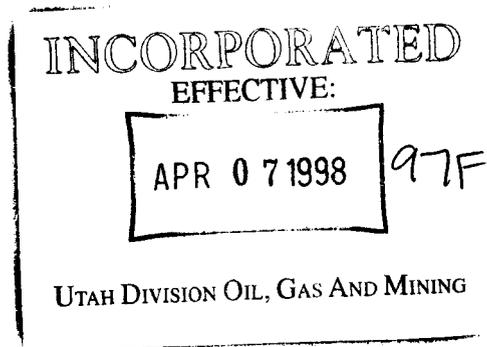
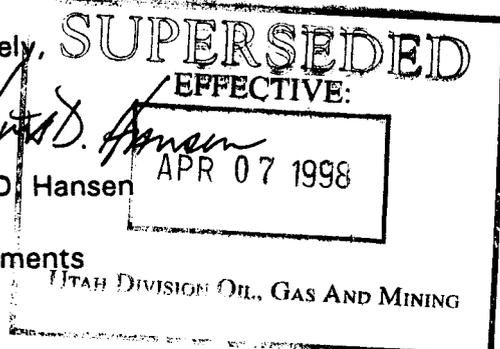
Based on the results of the analysis of the composite samples, these soils appear to be adequate as substitute topsoil/growth media. None of the reported analysis parameter results exceeded the Division's suggested limits for Vegetative Root Zone material as listed in Table 2 of the "Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining", Leatherwood, 1988.

If you have any questions regarding the sampling methods or analysis results, please give me a call at (801) 561-1555.

Sincerely,

Chris D. Hansen
Chris D. Hansen

attachments



**SELECT SOIL ANALYTICAL DATA
 PORTAL CANYON AREAS 1, 2, AND 3**

PARAMETER	UNITS	UDOGM ACCEPTABLE RANGE	SAMPLE NUMBER		
			#1	#2	#3
pH		4.5 - 9.0	7.4	7.3	7.5
EC	mmhos/cm	0 - 15	0.63	0.83	0.59
SATURATION	%	25 - 80%	36.6	38.9	35.4
SAR		0 - 12, 15	0.46	0.56	1.08
CALCIUM	meq/l	na	3.93	5.58	3.41
MAGNESIUM	meq/l	na	1.57	2.32	0.89
SODIUM	meq/l	na	0.75	1.10	1.59
COARSE FRAGMENTS	%	na	23.8	8.8	8.0
SAND	%	na	42.0	44.0	36.0
SILT	%	na	38.0	34.0	41.0
CLAY	%	na	20.0	22.0	23.0
AVAILABLE WATER HOLDING CAPACITY	%	5 - 15%	8.4	7.6	8.9
ACID POTENTIAL (% SULFUR)	tons CaCO ₃ / 1,000 tons material	na	0.03	0.09	0.04
NEUTRALIZATION POTENTIAL (% CaCO ₃) ⁽¹⁾	tons CaCO ₃ / 1,000 tons material	na	35.6	31.7	25.0
ACID/BASE POTENTIAL ⁽²⁾	tons CaCO ₃ / 1,000 tons material	> -5	34.5	28.9	23.7
TEXTURE ⁽³⁾		na	L	L	L

(1) CaCO₃ shown on IML lab data sheets as Neut. Pot. X 0.10. (i.e. Sample 129266 CaCO₃ = 19.8 X 0.1 = 1.98)
 (2) Acid/Base potential (ABP) calculation based on $ABP = NP - AP$, where NP is neutralization potential and AP is acid potential, $NP = \% CaCO_3 \times 10 = \text{tons of CaCO}_3/\text{tons of material}$, and $AP = \% S \times 31.24 = \text{tons of CaCO}_3/\text{tons of material}$.
 (3) Textural Classes: L - loam; LS - loamy sand; CL - clay loam; LS - loamy sand.

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Inter-Mountain Laboratories, Inc.
 Sheridan, Wyoming 82801

1633 Terra Avenue

Tel. (307) 672-8945

EARTHFAK ENGINEERING, INC.
 MEDVALE, UTAH

November 20, 1997

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Lab No.	Location	EC dmmhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
149385	PCRI. CANYON #1	0.63	36.6	3.93	1.57	0.75	0.45	23.8	42.0	36.0	20.0	LOAM
149386	#2	0.83	33.9	5.58	2.32	1.10	0.56	8.8	44.0	34.0	22.0	LOAM
149387	#3	0.59	35.4	3.41	0.89	1.59	1.08	8.0	35.0	41.0	23.0	LOAM

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Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available



Inter-Mountain Laboratories, Inc.
 Sheridan, Wyoming 82801

1633 Terra Avenue

Tel. (307) 672-8945

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 MEDVALL, UTAH

November 20, 1997

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Lab No.	Location	Depths	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
149385	PORT. CANYON #1		7.4	0.03	0.94	35.5	34.5					
149386	#2		16.0	0.09	2.81	31.7	28.9					
149387	#3		8.5	0.04	1.25	25.0	23.7					

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Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential



Inter-Mountain Laboratories, Inc.

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Sheridan, Wyoming 82801

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EARTHFAK ENGINEERING, INC.
PICAYUE, UTAH

November 20, 1997

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Lab No.	Location	Depths	P ppm	K ppm	Nitrate- Nitrogen ppm	Avail Na req/100g	Exch Na req/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
149385	PORT. CANYON #1		12.2	255.	1.70	0.54	0.51	0.13	17.9	9.5
149386	#2		11.1	157.	1.42	0.28	0.24	0.21	16.4	8.8
149387	#3		14.4	199.	1.30	0.34	0.28	0.13	18.7	9.8

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Appendix 8-1

Topsoil Stockpile Table

Topsoil/Growth Medium Recovery and Placement Calculations			
	1996	1997	Total (CY)
Topsoil Recovered During Mine Construction ^(a)	10,993 ^(b)		10,993
Topsoil Placed on Area D Appendix 8-1 - Plate A	-	499	499
Topsoil in Stockpile			10,494
In-place Soils (Estimate) Areas 10 & 11	3,733		3,733
Soil Medium Potentially Available for Reclamation ^(c)			14,448

(a) Surveyed Quantity

(b) Excludes hill described in Section 8.8.1 and on Plate A.

(c) Total of topsoil in stockpile plus in-place soils to be salvaged from areas 10 and 11. Approximately 23" of soil will be available for final reclamation (4.75 acres within disturbed area to be resoiled). Soils placed on Areas A, B, and C were generated during county road construction. Volume of soil used in Areas A, B, and C is not included in stockpile calculation. If these areas require additional soils at final reclamation, sufficient soils should be available from the stockpile.

Imported Topsoil Table	
Area	Topsoil (CY)
Jewkes Canyon - Area A	337
Portal Canyon - Area B	189
Portal Canyon - Area C	449
Total	975

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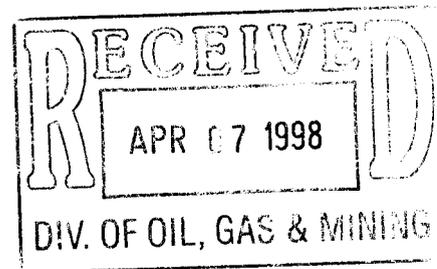
Application for Permit Change Detailed Schedule of Changes to the Permit

Title of Change: Culvert UC-3 Extension - Clean Copy Submittal	Permit Number: ACT/007/020
	Mine: Horizon Mine
	Permittee: Horizon Coal

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit change. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the exiting mining and reclamation plan. Include page, section and drawing numbers as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	<input checked="" type="checkbox"/> Chapter 3, text, tables and figures
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	<input checked="" type="checkbox"/> Appendix 3-7
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	<input checked="" type="checkbox"/> Appendix 3-9, including Drawing A, Proposed Culvert Extension
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	<input checked="" type="checkbox"/> Chapter 7, page 7-54
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	<input checked="" type="checkbox"/> Appendix 7-12, add stream alteration permit to existing information
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Plate 7-5, Drainage - Operations
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	<input checked="" type="checkbox"/> Chapter 8, text, tables and figures
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	<input checked="" type="checkbox"/> Appendix 8-1, add information to the existing information, including Plate A and B
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 9, pages 9-2, 9-6 - 9-12
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	<input checked="" type="checkbox"/> Plate A - Surveyed Riparian Area to Appendix 9-2

April 7, 1998





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

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

April 7, 1998

Denise Dragoo, Resident Agent
Van Cott, Bagley, Cornwall, & McCarthy
50 South Main Street, Suite 1600
Salt Lake City, Utah 84111-1495

Re: UC-3 Culvert Extension, Horizon Mining, LLC, Horizon Mine, ACT/007/020-97D, File #3, Carbon County, Utah

Dear Ms. Dragoo:

A stamped approved incorporated copy of the referenced amendment is provided for insertion into your Mining and Reclamation Plan.

If you have any questions, please call.

Sincerely,

A handwritten signature in cursive script, appearing to read "Joseph C. Helfrich".

Joseph C. Helfrich
Permit Supervisor

tat
Enclosure

cc: Ranvir Singh, OSM
Richard Manus, BLM
Alan Rabinoff, BLM, w/o
Mark Page, Water Rights, w/o
Dave Ariotti, DEQ, w/o
Bill Bates, DWR, w/o
Vicky Bailey, EarthFax
Price Field Office

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State of Utah
DEPARTMENT OF NATURAL RESOURCES
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March 27, 1998

Denise Dragoo, Resident Agent
Van Cott, Bagley, Cornwall, & McCarthy
50 South Main Street, Suite 1600
Salt Lake City, Utah 84111-1495

Re: UC-3 Culvert Extension, Horizon Mining, LLC, Horizon Mine, ACT/007/020-97D, File #2, Carbon County, Utah

Dear Ms. Dragoo:

The referenced amendment is hereby approved effective March 27, 1998. Due to the complexity of this amendment we would request that a representative of Horizon Coal Co. assist the Division in compiling the documents for this amendment prior to distribution for insertion into your Mining and Reclamation Plan.

If you have any questions, please call.

Sincerely,

Joseph C. Helfrich
Permit Supervisor

tat

cc: Ranvir Singh, OSM
Richard Manus, BLM
Alan Rabinoff, BLM
Mark Page, Water Rights, w/o
Dave Ariotti, DEQ, w/o
Bill Bates, DWR, w/o
Vicky Bailey, EarthFax
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March 20, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Robert Davidson, Soils Reclamation Specialist *RAO*

RE: UC-3 Culvert Extension, Horizon Mining, LLC, Horizon Mine, ACT/007/020-97D, Folder #2, Carbon County, Utah

SYNOPSIS:

Horizon Coal Corporation has submitted an amendment for extending Culvert UC-3 100 feet northward. The 36" culvert currently carries Jewkes Creek beneath the lower pad area and around the sedimentation pond. The purpose for the culvert extension is to alter the truck turnaround radius, thus enlarging the lower facilities pad for safety reasons.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

SOILS RESOURCE INFORMATION

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

Analysis:

The culvert extension amendment contains the following soils environmental resource information:

- Affected Area Boundary Map
- Soils Description

Affected Area Boundary Map

The disputed area for the culvert extension lies northward of the current disturbed area boundary as shown in the approved MRP and on photographs (see Figure 1 of this TA memo) taken during construction last fall, 1996. The placement of the disturbed boundary marker as shown in Figure 1 is consistent with the marked disturbance boundary as shown in the original approved Mine Reclamation Plan. However, Horizon claims this area as part of the established disturbance area because of errors in

surveying that were corrected during a survey performed during the summer of 1997. Drawing A, Appendix 3-9, shows the revised disturbance boundary as it exists in the field after the 1997 survey.

Soils Description

Since the culvert extension falls within the surface disturbance boundary, soil resource information for the proposed disturbance may be represented by the currently approved Mine Reclamation Plan (MRP). Two soil pits were excavated in the lower facilities area during 1996. The first pit was located in the bottom of Jewkes Creek channel while the second pit was located on top of the west bank of the Jewkes Creek drainage. In both locations soils were shown to be previously disturbed with past mining activity. The upper 5 feet of soils in the west bank have been previously disturbed and/or imported while the Jewkes Creek soils contained inter-bed layers of coal fines. Sample results indicate that soils in both areas are acceptable as substitute topsoil and/or backfill with the exception of the coal fines layer in the Jewkes Creek channel.

The Jewkes Creek channel soils are unique since they have a fluvial origin which terminate at bed rock located 12 feet down. The material consists mainly of sandy loam inter-bedded with coal fines ($\approx 30\%$) and loam with a high bedding angle. The Jewkes Creek soils contain less than 10 percent rocks with no coarse fragments. Furthermore, the Jewkes Creek soils were shown to have hydric development associated with the riparian environment.

Findings:

The information provided meets the regulatory requirements of this section.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

The UC-3 culvert extension project covers the following operational considerations for soil salvage and protection of the soil resource:

- Soil Salvage Locations
- Soil Specialist Supervision
- General Soil Salvage Considerations
- Jewkes Creek Soils - Special Considerations
- Soil Salvage Updates

Soil Salvage Locations

The amendment states that soil salvage included soils from the bottom of Jewkes Canyon and

along the east and west adjacent hillsides. The total amount of soil salvaged was 280 cubic yards (cy) and consisted of 156 cy of riparian soil and 124 cy of hillside topsoil.

Soil Specialist Supervision

The current approved MRP requires that a qualified soils specialist be on site during soil salvage operations. Horizon hired an independent "Environmental Consultant," Patricia K. Johnston, to supervise the soils salvage operations during the culvert extension project. A copy of a letter dated January 4, 1998, to EarthFax Engineering from Patricia K. Johnston outlining soil salvage activities has been included in the back of Appendix 3-9. *Neither the letter or Appendix 3-9 state the actual dates that the culvert extension project commenced or concluded. Neither the Mine Reclamation Plan, the letter, or Appendix 3-9 give the qualifications of Patricia K. Johnston as a "soils specialist," and therefore no conclusion can be made to her qualifications to conduct soil salvage operations.*

General Soil Salvage Considerations

The existing MRP states that the vegetation cover will be removed and incorporated into the topsoil prior to stockpiling. Trash, concrete, and debris will be hauled to a properly licensed disposal facility as it is removed from the mine site during topsoil removal (page 8-23). Plate 8-2B shows soil removal areas for the culvert extension. Plate 8-2A shows soil removal locations for the Horizon mine site prior to culvert extension. At the time of the culvert extension installation, the permanent topsoil stockpile was inaccessible during soil salvage operations. Therefore, temporary topsoil stockpiles for both the riparian and non-riparian soils were created in Area E (located on Plate A in Appendix 8-1). When conditions permit access to the permanent topsoil stockpile and with Division approval, both temporary topsoil stockpiles will be moved.

The amendment states that a portion (90 cy) of the non-riparian topsoil salvaged from the hillsides during culvert installation was placed at a 6-inch depth on a slope located adjacent to the culvert designated as Area E. After topsoil was placed and spread on Area E, the remaining non-riparian (34 cy) topsoil/growth medium salvaged was placed in a temporary stockpile in Area E, separate from the riparian, Jewkes Creek temporary topsoil pile.

Jewkes Creek Soils - Special Considerations

Since the Jewkes Creek channel soils are unique in their fluvial origin in supporting the riparian/wet meadow vegetation which currently exists on site, these soils need special consideration for salvage and storage for reclamation use. In the Jewkes Creek area during initial construction of the sediment pond, all available excavated soils were salvaged and stored in the stockpile for later reclamation. Soils in the riparian area were dried prior to salvage and the subsequent inclusion in the topsoil stockpile. These necessary steps protected these waterlogged soils from compaction and clod formation during soil salvage operations.

During the culvert extension in December 1997, the riparian topsoil salvaged from Jewkes Creek was stockpiled in a temporary stockpile in Area E, separate from the temporary non-riparian soil stockpile. A geotextile fabric was placed underneath the pile prior to creating the temporary stockpile for the purpose of determining the extent of the riparian soil when the riparian soil is transferred to the

permanent stockpile. Both the temporary and permanent riparian topsoil locations are segregated from other topsoil and are identified as riparian topsoil.

Soil Salvage Updates

Table 8-3 has been updated for soil salvage activities associated with culvert expansion. This table shows all topsoil/growth medium recovery areas, soil types, salvage depths and resulting volumes of soils stored at the top of Portal Canyon in the stockpile.

A "Topsoil Stockpile Table" is included in Appendix 8-1 showing results for topsoil recovery and placement during 1996 and 1997. The current surveyed volume of soil in the stockpile is shown as 10,494 cy. Temporary stockpiles for both riparian and non-riparian soil is shown as 156 cy and 124 cy, respectively. Total salvaged soil is therefore 10,774 cy. With in-place soils in Areas 10 and 11, the volume of soil available for reclamation is 14,507 cy.

Plate A, Appendix 8-1, shows soil distribution within the disturbance area. These are correlated with the Table in Appendix 8-1 for topsoil recovery and placement as follows:

SOIL SOURCE	CUBIC YARDS	PLATE A LEGEND
topsoil salvaged in 1996 by surveying topsoil stockpile	10,993	
topsoil redistributed 1997 from stockpile	(499)	red & green
current stockpile 1998	10494	
Area E nonrip. soil placement 1998	90	purple
Area E temporary stockpiles 1998	190	purple
total salvaged soils	10774	
Areas 10 & 11 in-place soils	3733	
Total soils available for final reclamation	14507	
Imported soils Areas A, B, & C 1997	975	blue

Findings:

The information provided meets the regulatory requirements of this section.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

The reclamation portion of the culvert extension amendment contains the following items that are either discussed or still need additional corrections:

- Jewkes Creek Riparian Soils
- Soils Redistribution
- Contemporaneous and Interim Reclamation

Jewkes Creek Riparian Soils

Since a portion of this disturbance is a riparian area, the commitments within the Horizon permit concerning riparian reclamation apply. These commitments include replacement of the riparian soil salvaged from the Jewkes Creek riparian area as referenced in Appendix 8-1, Soil Salvage Practices Fall 1996 report submitted on December 15, 1996 to Horizon Coal Corporation from EarthFax Engineering which states the following commitment on Page 2:

“Topsoil from Area 1, the designated riparian area, was collected and stored at the front of the topsoil pile, the southwestern corner, to be utilized for reestablishment of riparian vegetation during reclamation.”

However, during portal construction with the resulting crushed culvert, the front portion of the topsoil stockpile was disturbed and the riparian soils were redistributed to “Area D” as shown on Plate A in Appendix 8-1.

The Appendix 3-9, Section 3-9.6, contains a commitment to return “riparian” soil salvaged from the culvert extension back to the floodplain in Jewkes Canyon at final reclamation. The riparian topsoil stored in the topsoil stockpile will be identified with signs to enable redistribution of the riparian soil back to the bottom of Jewkes Canyon floodplain at final reclamation. The floodplain areas are shown on Plate 3-7, Reclamation Topography.

Soils Redistribution

Horizon further states that soils and fill material disturbed during mining will be placed within the disturbed area boundary. This is consistent with the current approved MRP which contains numerous references concerning fill placement against cut slopes and high walls. During reclamation, fill excavation will be required from Portal Canyon and Jewkes Creek facility pad areas for achieving the approved channel design and reclamation contours (see Plate 3-7, Reclamation Topography, and Plate 3-7A, Post Mining Cross Sections). As shown on Plate 3-7, certain portions of contemporaneous reclaimed slopes will be affected during final reclamation. Placed soils in "Areas B, C & E" will be affected, needing a portion of the contemporaneously placed topsoil removed so that fill can be placed against these slopes to reach final reclamation topography. After reaching the desired topography, the displaced "contemporaneous" topsoil will be replaced.

Contemporaneous and Interim Reclamation

Plate A, Appendix 8-1, illustrates contemporaneous and interim reclamation areas for the Horizon surface facility areas. Contemporaneous reclamation areas include the following:

- Soils imported and placed by Hidden Splendor Resources during county road realignment. Soil placement depth is 10 to 12 inches. Volumes shown in Appendix 8-1 Table for topsoil recovery and placement.
- Soils redistributed from the topsoil stockpile during the construction of the portals and the subsequent repair of a crushed culvert beneath the topsoil stockpile. Soil placed in Area D is 10 to 12 inches, the volume listed at 499 cy as shown in Appendix 8-1 Table for topsoil recovery and placement.

Interim reclamation areas include:

- Soils placed in Area E during UC-3 culvert extension (6" depth, 90 cy).

Findings:

The information provided meets the minimum regulatory requirements for this section.

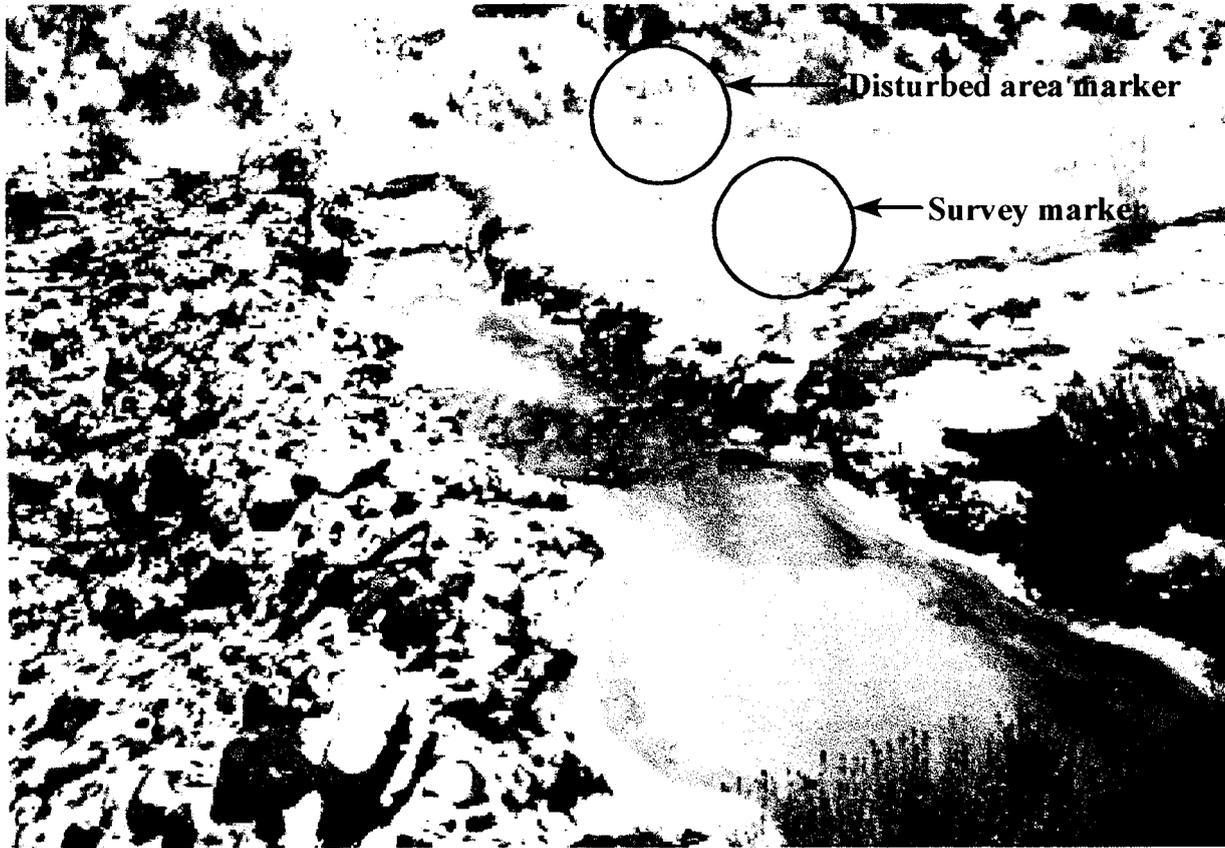


Figure 1. 10/30/96, Horizon Mine. ACT/007/020 on-site inspection . DOGM personnel - Susan White, Sharon Falvey and Robert Davidson. The upper Jewkes Creek disturbance area boundary is shown by the white disturbance marker and the orange survey stake. Jewkes Creek is draining into the excavated ditch that crosses the upper end of the meadow area with the Jewkes Creek located outside the marked disturbance area. The disturbance boundary sign and survey stake are located in the center of the drainage, just above the ditch and adjacent to the Creek. This photograph showing the placement of the disturbed boundary marker is consistent with the marked disturbance boundary as shown in the original approved Mine Reclamation Plan maps.



State of Utah
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DIVISION OF OIL, GAS AND MINING

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March 18, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Jess Kelley, Reclamation Specialist *JK*

RE: UC-3 Culvert Extension, Horizon Coal Company, LLC, Horizon Mine, ACT/007/020-97D, Folder #2, Carbon County, Utah

SUMMARY:

In 1997, the turnaround area at the confluence of Portal Canyon and Jewkes Creek was enlarged. The pad in that area was extended approximately 100 feet up Jewkes Creek and the bypass culvert underlying the pad was also lengthened to accommodate the extension. This enlargement became inextricably connected with 2 violations (N97-45-1-1 and N97-26-7-1) which the Division issued at about the same time. This amendment was finally redesignated Amendment 97D and submitted for Division approval on December 10, 1997.

The Division reviewed the December 10 submittal and, because of more confusion of the issues among the 3 submittals, issued a letter outlining the deficiencies in Amendment 97D on January 21, 1998. From December 10, 1997 until the early part of March 1998, the permittee submitted a great deal of material and met with the Division a number of times in trying to correct the deficiencies set forth in that letter. Finally, on March 11, 1998, this process culminated in the permittee's making of a final submittal at the request of the Division. This memorandum constitutes this writer's technical review of the final version of the UC-3 Culvert amendment as it emerged from this process.

TECHNICAL ANALYSIS:

OPERATION PLAN

RELOCATION OR USE OF PUBLIC ROADS

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

Analysis:

In 1997, the turnaround area at the confluence of Portal Canyon and Jewkes Creek was enlarged. This enlargement was designated Amendment 97D. The pad in that area was extended approximately 100 feet up Jewkes Creek and the bypass culvert underlying the pad, culvert UC-3, was

also lengthened to accommodate the extension.

The pad and bypass culvert modifications done under Amendment 97D involved the removal of a hillside adjacent to the enlarged pad area. Since this hillside was within the right-of-way of a public road (Carbon County Consumers Road), the permittee has provided documentation that Carbon County has approved the location of this operation within that right-of-way, as required by R645-301-521.133. This documentation is in the form of two approval letters from Carbon County to the permittee. These letters are found in Appendix 4-1.

Findings:

The plan fulfills the requirements of this section.

RECLAMATION PLAN

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:

Reclamation backfilling and grading maps.

In 1997, the turnaround area at the confluence of Portal Canyon and Jewkes Creek was enlarged. This enlargement was designated Amendment 97D. The pad in that area was extended approximately 100 feet up Jewkes Creek and the bypass culvert underlying the pad, culvert UC-3, was also lengthened to accommodate the extension.

The permittee revised Plate 3-7--Reclamation Topography to show the anticipated final surface configuration of the culvert and pad extension area of Amendment 97D. Plate 3-7 also shows the locations of 8 cross sections which were derived from this map and are shown on Plate 3-7A--Post Mining Cross Sections.

The permittee used the cross sections shown on Plate 3-7A to derive cut-and-fill volume estimates for final reclamation. These estimates are shown in Table 3-1, page 3-30. They show an estimated cut volume of approximately 11,695 cubic yards and an estimated fill requirement of approximately 15,935 cubic yards. The deficit of 4,240 cubic yards will be made up with stockpiled topsoil, of which there are approximately 14,717 cubic yards, as shown in Appendix 8-1. Since the area to be topsoiled is approximately 5.49 acres, this will make for a layer almost 20 inches in thickness. As explained in Appendix 8-1, the topsoil will be distributed evenly over the recontoured area and will *not* be used to construct fills or fill in depressions.

Plates 3-7 and 3-7A were certified January 16, 1998 by Richard B. White, a professional engineer registered in the state of Utah.

Final surface configuration maps.

In 1997, the turnaround area at the confluence of Portal Canyon and Jewkes Creek was enlarged. This enlargement was designated Amendment 97D. The pad in that area was extended approximately 100 feet up Jewkes Creek and the bypass culvert underlying the pad, culvert UC-3, was also lengthened to accommodate the extension.

The permittee revised Plate 3-7--Reclamation Topography to show the anticipated final surface configuration of the culvert and pad extension area of Amendment 97D. This map was certified January 16, 1998 by Richard B. White, a professional engineer registered in the state of Utah.

Findings:

The plan fulfills the requirements of this section.

BONDING AND INSURANCE REQUIREMENTS

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

Analysis:

Determination of bond amount

In 1997, the turnaround area at the confluence of Portal Canyon and Jewkes Creek was enlarged. This enlargement was designated Amendment 97D. The pad in that area was extended approximately 100 feet up Jewkes Creek and the bypass culvert underlying the pad, culvert UC-3, was also lengthened to accommodate the extension.

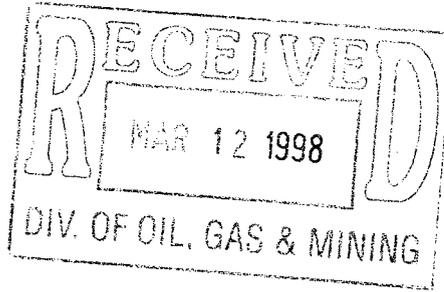
Amendment 97D turned into a rather lengthy process which involved several submittals by the permittee and several meetings between the permittee and the Division. In the process, the disturbed area, on which the original reclamation cost estimate was based, shrank from approximately 7.5 acres to 5.49 acres. Thus, no increase in the reclamation cost estimate or the approved reclamation bond was necessary and none was made.

Findings:

The plan fulfills the requirements of this section.

RECOMMENDATION:

It is recommended that this amendment be approved and included as part of the approved plan.



EarthFax

EarthFax
Engineering Inc.
Engineers/Scientists
7324 So. Union Park Ave.
Suite 100
Midvale, Utah 84047
Telephone 801-561-1555
Fax 801-561-1861

March 11, 1998

ACT/007/020 #2

Jess, Joe

Utah Coal Program
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114

97D

Subject: Horizon Coal Corporation submittal of revisions to UC-3 Culvert Extension.

Please find enclosed 6 copies of changes to the Horizon Coal Corporation permit. These changes include revisions to Chapters 3 and 8. The revisions were in response to a phone call by Jess Kelly and a subsequent meeting at the Division on Monday, March 9, 1998.

We hope these revisions will complete the UC-3 culvert extension submittal and will facilitate the amendment's approval.

If you have any questions please contact me at (801) 561-1555.

Sincerely yours,

Vicky S. Bailey
Permit Coordinator

cc: Bill Malencik



State of Utah
DEPARTMENT OF NATURAL RESOURCES
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January 21, 1998

Denise Dragoo, Resident Agent
VanCott, Bagley, Cornwall, & McCarthy
50 South Main Street, Suite 1600
Salt Lake City, Utah 84111

Re: Extension of Culvert UC-3 and Adjacent Disturbed Area Boundary, Horizon Coal Company, Horizon Mine, ACT/007/020-97D-1, File #2, Carbon County, Utah

Dear Ms. Dragoo:

The Division staff has completed their review of the referenced amendment. Please address the following regulatory requirements by February 3, 1998.

R645-300-142 and 143, R645-301-120, R645-301-500 and R645-301-600, The unapproved reclamation activities (N97-45-1-1) altered the approved Mine Reclamation Plan by changing calculated final reclamation fills thereby invalidating portions of the approved reclamation plan. Prior to approval of the UC-3 culvert extension, the amended MRP needs to describe in detail how reclamation will be achieved to reestablish both drainage areas in Jewkes Creek and Portal Canyon. The applicant needs to provide a narrative which clearly describes the precise removal and ultimate placement of construction fills during reclamation, also plates showing revised reclamation contours and cross sections.

R645-301-120, The applicant needs to update the operational topography and surface facilities' maps to reflect the projected impact of the UC-3 culvert installation and provide plates showing the revised operational contours and cross sections.

R645-301-231.400, The applicant needs to provide a topsoil stockpiling plan. It is not possible to determine how much topsoil and/or substitute topsoil will be displaced by the construction of the culvert extension and where that material will be stockpiled.

R645-301-234, Rather than a temporary stockpile (Area E), locate an area (e.g., below the sediment pond) for permanent topsoil storage that will provide the least amount of disturbance and damage to soil. Provide erosion control measures to protect against soil loss and sediment loading to the adjacent Jewkes Creek.

R645-301-330. The permit commits to disturb the minimum area required for operations, yet 100' of a culvert in addition that which is currently approved is proposed. Only that area necessary for the current mine operations can be culverted. The applicant needs to provide an updated operations map and text to justify the need for the additional culvert.

R645-301-526.116. The permit is unclear as to the exact boundaries of the Carbon County Beaver Creek road right-of-way. This right-of-way must be depicted on a map (Operations map is preferred) where the mine disturbed area and road right-of-way are located. Documentation must be provided demonstrating that the County has authorized specific proposed mining and/or reclamation operations within the right-of-way should that be the case.

R645-301-521.150, The maps accompanying the submittal need to be revised to show the proposed topography of the culvert extension area.

R645-301-521.100, The applicant needs to provide a volume analysis for the proposed culvert extension area. It is not possible to determine how much fill material will be used to construct the extension or where that material will come from.

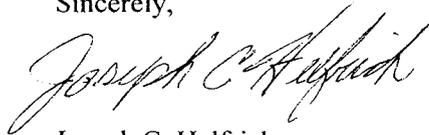
R645-301-521.162, The submittal mentions some "100 feet x 50 feet [sic] portion of an adjacent hillside" that will be "disturbed" during the construction of the culvert extension. There is no hint, however, of where that hillside is or exactly what will be done to it.

R645-301-541.400, The applicant needs to provide a reclamation plan for the culvert extension area. The maps have not been revised to show the proposed final topography and there are no estimates of how much fill material will be required to construct that topography or where that material will come from.

R645-301-542.800, The applicant needs to provide an estimate of the cost of reclaiming the culvert extension area. There is some mention of the cost of removing the culvert itself, but there are no estimates of the costs associated with the necessary reclamation earthwork.

If you have any questions please call.

Sincerely,



Joseph C. Helfrich
Permit Supervisor

tat

cc: Vicky Bailey, EarthFax
O:\007020.HZN\DRAFT\DEFICIEN.D-1



State of Utah
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January 14, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Jess Kelley, Reclamation Specialist *JK*

RE: Deficiencies in UC-3 Culvert Extension Amendment Application, Horizon Coal Company, Horizon Mine, ACT/007/020-AM97D-1, Folder #2, Carbon County, Utah

SUMMARY:

The permittee first submitted this amendment for Division review during the summer of 1997. After protracted negotiation and discussion with the Division and a complete revision of site base maps, the permittee again submitted the amendment, in a modified form, on December 10, 1997. Division reviewers found the December 10 submittal to be so incomplete that Permit Supervisor Joe Helfrich instructed them to simply compile a list of its deficiencies. This memorandum contains this writer's list of deficiencies.

TECHNICAL ANALYSIS:

The following are deficiencies in the December 10 submittal which make it impossible for the Division to approve or even properly review that submittal.

- 1) The maps accompanying the submittal show only the present topography. They have not been revised to show the proposed topography of the culvert extension area. *R645-301-521.150*
- 2) The submittal contains no volume analysis for the proposed culvert extension area. It is thus impossible to determine how much fill material will be used to construct the extension or where that material will come from. *R645-301-521.100*
- 3) The submittal contains no topsoil stockpiling plan. It is thus impossible to determine how much topsoil and/or substitute topsoil will be displaced by the *R645-301-231.400*

construction of the culvert extension and where that material will be stockpiled.

- 4) The submittal mentions a "100 feet x 50 feet [sic] portion of an adjacent hillside" that will be "disturbed" during the construction of the culvert extension. There is no hint, however, of where that hillside is or exactly what will be done to it.
R645-301-521.162
- 5) The submittal contains no reclamation plan for the culvert extension area. The maps have not been revised to show the proposed final topography and there are no estimates of how much fill material will be required to construct that topography or where that material will come from. R645-301-541.400
- 6) The submittal contains no estimate of the cost of reclaiming the culvert extension area. There is some mention of the cost of removing the culvert itself, but there are no estimates of the costs associated with the necessary reclamation earthwork.
R645-301-542.800

RECOMMENDATION:

The permittee must correct the deficiencies listed above before the Division can approve or even review the proposed amendment.



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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January 14, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Susan White, Senior Reclamation Biologist *SMW*

RE: Culvert Extension, Round II, Horizon Coal Corporation, Horizon Mine, ACT/007/020-97D, Folder #2, Carbon County, Utah

SUMMARY:

A permit change application was received September 18, 1997 from Horizon Coal Company requesting a 100 foot extension of the existing culvert which contains Jewkes Creek. The culvert extension will disturb additional high value habitat within the wet meadow/ wetlands/ riparian community. The permit change was not approved and a technical analysis with deficiencies was provided to the Operator. A response from those deficiencies was received from the Operator on December 10, 1997. Below is a list of deficiencies resulting from the review of the permit change submitted December 10, 1997.

LIST OF DEFICIENCIES

- R645-301-330.** The permit commits to disturb minimum area required, yet 100' of culvert is beyond that which is necessary for the operation. Only that area necessary for the current mine operations can be culverted. An operations map may help clarify the need for the culvert.
- R645-301-340.** No reclamation plan could be found for the proposed culvert area. Detailed reclamation maps and cross section maybe sufficient to describe the reclamation of this additional area.
- R645-301-526.116.** The permit is unclear as to the exact boundaries of the Carbon County Beaver Creek road right-of-way. This right-of-way must be depicted on a map (Operations map is preferred) where the mine disturbed area and road

Technical Analysis

ACT/007/020-97D

January 14, 1998

Page 2

right-of-way abut. Documentation or correspondence must be provided that the County is aware and has authorized specific proposed mining and/or reclamation operations performed within the right-of-way.

RECOMMENDATION

Prior to approval the requirements of R645-301-300 must be provided as outlined above.



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

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Ted Stewart
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January 13, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Robert Davidson, Soils Reclamation Specialist *RAD*

RE: UC-3 Culvert Extension Amendment, Horizon Mine, Horizon Coal Corporation, ACT/007/020-97D-1, Folder #2, Carbon County, Utah

SYNOPSIS:

Horizon Coal Corporation submitted an amendment for extending Culvert UC-3 100 feet northward. Currently, the 36-inch, UC-3 culvert carries Jewkes Creek beneath the lower pad area and intersects the UC-2 culvert. The combined culvert is then identified as UC-1 and continues beneath the lower pad and around the sedimentation pond. The purpose for the culvert extension is to extend the lower pad and alter the truck turnaround radius, thus enlarging the lower facilities pad for safety reasons. This review provides a bullet list for the latest December 10, 1997 submittal.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

SOILS RESOURCE INFORMATION

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

Findings:

The information provided meets the minimum regulatory requirements of this section.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Findings:

The information provided does not meet the regulatory requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-301-120, Update operation topography and surface facilities maps to reflect the projected impact of the UC-3 culvert installation. Provide plates showing revised operational contours and cross sections.

R645-301-234, Rather than a temporary stockpile (Area E), locate an area (e.g., below the sediment pond) for permanent topsoil storage that will provide the least amount of disturbance and damage to soil. Provide erosion control measures to protect against soil loss and sediment loading to the adjacent Jewkes Creek.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

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

Findings:

The information provided does not meet the regulatory requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-300-142 and 143, R645-301-120, R645-301-500 and R645-301-600, The unapproved reclamation activities (N97-45-1-1) altered the approved Mine Reclamation Plan by changing calculated final reclamation fills thereby invalidating portions of the approved reclamation plan. Prior to approval of the UC-3 culvert extension, the amended MRP needs to describe in detail how reclamation will be achieved to reestablish both drainage areas in Jewkes Creek and Portal Canyon. Discuss the precise removal and ultimate placement of construction fills during reclamation, and provide plates showing revised reclamation contours and cross sections.

Horizon Coal Corporation
P.O. Box 599
Helper, UT 84526

December 10, 1997

Coal Division
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Salt Lake City, UT 84114-5801

To Whom It May Concern,

ACT/007/020 #2

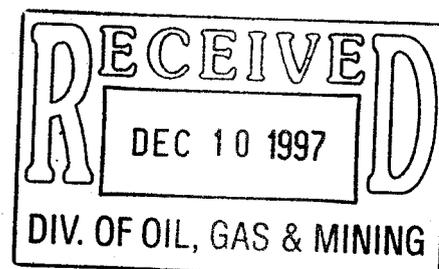
Upon a request by Horizon Coal Corporation, please find enclosed 6 copies of information to address the extension of Culvert UC-3. The bulk of this information has been submitted and previously reviewed, however for clarity all information has been resubmitted. An expedient review and approval of this extension would be appreciated.

If you have any questions please contact me at (801) 561-1555.

Sincerely yours,

Vicky S. Bailey

Vicky S. Bailey



APPLICATION FOR PERMIT PROCESSING

<input checked="" type="checkbox"/> Permit Change	<input type="checkbox"/> New Permit	<input type="checkbox"/> Renewal	<input type="checkbox"/> Transfer	<input type="checkbox"/> Exploration	<input type="checkbox"/> Bond Release	Permit Number: ACT/007/020
---	-------------------------------------	----------------------------------	-----------------------------------	--------------------------------------	---------------------------------------	----------------------------

Title of Proposal: Response to Deficiencies for the Culvert UC-3 Extension Amendment	Mine: HORIZON
	Permittee: HORIZON COAL

Description, include reason for application and timing required to implement:

Instructions: If you answer yes to any of the first 8 questions (gray), submit the application to the Salt Lake Office. Otherwise, you may submit it to your reclamation specialist.

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	1. Change in the size of the Permit Area? _____ acres Disturbed Area? _____ acres <input type="checkbox"/> increase <input type="checkbox"/> decrease.
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	2. Is the application submitted as a result of a Division Order? DO # _____
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	4. Does application include operations in hydrologic basins other than as currently approved?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	6. Does the application require or include public notice/publication?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	7. Does the application require or include ownership, control, right-of-entry, or compliance information?
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	9. Is the application submitted as a result of a Violation? NOV # _____
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	10. Is the application submitted as a result of other laws or regulations or policies? Explain: _____
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	11. Does the application affect the surface landowner or change the post mining land use?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2?)
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	13. Does the application require or include collection and reporting of any baseline information?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	15. Does application require or include soil removal, storage or placement?
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	16. Does the application require or include vegetation monitoring, removal or revegetation activities?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	17. Does the application require or include construction, modification, or removal of surface facilities?
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	18. Does the application require or include water monitoring, sediment or drainage control measures?
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	19. Does the application require or include certified designs, maps, or calculations?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	20. Does the application require or include subsidence control or monitoring?
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	21. Have reclamation costs for bonding been provided for?
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	23. Does the application affect permits issued by other agencies or permits issued to other entities?

Attach 6 complete copies of the application.

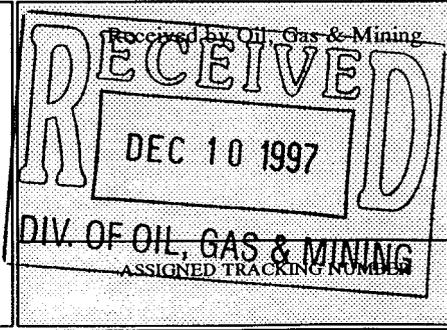
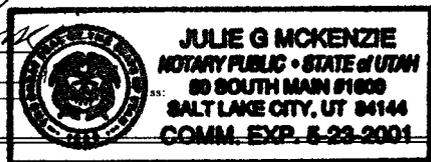
I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Larry H. Jones V.P. Mining
 Signed - Name - Position - Date

Subscribed and sworn to before me this 10th day of Dec, 19 97.

Julie G. McKenzie
 Notary Public

My Commission Expires _____, 19____
 Attest: STATE OF _____ COUNTY OF _____



Application for Permit Change Detailed Schedule of Changes to the Permit

Title of Change: Response to Deficiencies for the Culvert UC-3 Extension Amendment

Permit Number: ACT/007/020

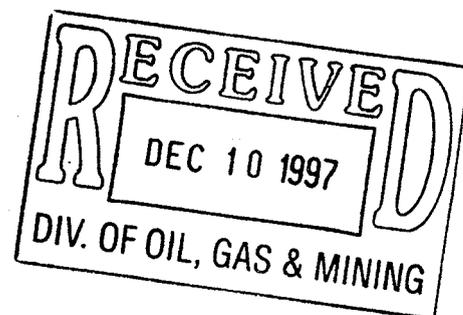
Mine: Horizon Mine

Permittee: Horizon Coal Corporation

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit change. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the exiting mining and reclamation plan. **Include page, section and drawing numbers as part of the description.**

	DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
<input type="checkbox"/> ADD <input checked="" type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Chapter 9, Pages 9-2, 9-6 through 9-10
<input checked="" type="checkbox"/> ADD <input type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Appendix 9-2 - Plate A
<input type="checkbox"/> ADD <input checked="" type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Chapter 8, Text, Tables and Figures
<input checked="" type="checkbox"/> ADD <input type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Appendix 8-1 Data, and Plates A and B - add to the back of existing data
<input type="checkbox"/> ADD <input checked="" type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Chapter 7, Page 7-54
<input checked="" type="checkbox"/> ADD <input type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Appendix 7-12 - add to the back of existing data
<input type="checkbox"/> ADD <input checked="" type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Plate 7-5
<input type="checkbox"/> ADD <input checked="" type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Chapter 3, Pages 3-vi, 3-25, 3-34, 3-35 and 3-44
<input type="checkbox"/> ADD <input checked="" type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Appendix 3-7, Page A3-7-2
<input checked="" type="checkbox"/> ADD <input type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	Appendix 3-9 and Drawing A
<input type="checkbox"/> ADD <input type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	
<input type="checkbox"/> ADD <input type="checkbox"/> REPLACE <input type="checkbox"/> REMOVE	

December 10, 1997





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

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801-538-7223 (TDD)

November 17, 1997

TO: File

THRU: Daron Haddock, Permit Supervisor *DH*

FROM: Sharon Falvey, Senior Reclamation Specialist *SFF*

RE: Culvert Extension 97D, Horizon Coal Company, Horizon Mine, ACT/007/020-97D
10/17/97, Folder #2, Carbon County, Utah

SYNOPSIS

This amendment, was received on October 17, 1997, as a response to deficiencies noted from an earlier submittal received September 18, 1997 and September 30, 1997. Applicable portions of the Technical Analyses (TA) should be incorporated into the next TA update. Although the proposal itself does not represent a major change to the plan. The change in the disturbed area and contour information will require updates to all applicable maps in the MRP.

ANALYSIS

OPERATION PLAN

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:

Diversions.

Additional information on the extension to UC-3 is provided in Appendix 3-9. Culverts UC-1 and UC-3 receive drainage coming from the Jewkes Creek, an intermittent stream, designed to carry the flow from a 100-year, 6-hour event. This extension does not negatively affect the capacity of the existing stream channel culvert.

Stream Buffer Zones.

The permittee must demonstrate that all requirements of 742.300 are met prior to approval and findings of this section (see R645-301-742.322). The permittee is required to provide the stream buffer zones and assure they are adequately marked during the channel construction. The text indicates buffer zone signs will be placed adjacent to Jewkes Creek, a sign must also be placed at the upstream boundary of the buffer zone. This is a performance standard which will be enforced in the field.

The permittee has provided a copy of the stream alteration permit 97-91-08SA for the proposed extension. This permit expires on August 14, 1998.

Sediment Control Measures.

According to the certified letter from Richard White P.E. in appendix 3-9, the additional disturbed area does not increase the runoff volume to the sedimentation pond because the actual disturbed area is less than that determined in the approved plan.

The division has found the following information has not been adequately presented in the calculated runoff volume (0.56 acre feet) presented in the plan:

- The undisturbed areas draining to the pond and operational drainag areas have changed.
- It was determined that the method used in averaging the curve number did not provide an acceptable runoff value, based on calculations completed by the Division.
- The maps are not consistent for disturbed areas, and some watershed delineations are not complete.

Based on the submitted drawing, and the watersheds depicted on Plate 7-5, it was determined that there were conflicts between maps and the designs presented in the text making it difficult to verify the work presented by the permittee. Therefore, the division conducted it's own analyses.

The total watershed area presented did result in similar total area draining to the pond. Based on presented information the division obtained runoff volumes varying from a conservative value of 1.08 acre feet to 0.81 acre feet using the SCS method, Type II Storm for the precipitation from the 10-year, 24-hour storm event. However, the total volume in the pond does allow for containment of 1.08 acre feet. With adequate sediment storage at the existing maximum sediment storage of 1.12 acre feet at the 7582 foot elevation. Therefore the pond size is considered adequate.

Findings:

Assuming the stage discharge curve for the pond is accurate, the pond appears to have adequate run-off volume. The maps, watershed areas, and operation design calculations are confusing and do not appear to accurately reflect the site conditions, additionally the plan contains a non-conservative estimated runoff volume which could not be verified by the Division.

The permittee must provide the following, in accordance with the requirements of:

R645-301-731. Provide maps, descriptions and calculations, containing current information specific to the local hydrologic conditions. Include complete delineation of the disturbed and undisturbed area watersheds, as well as, updated operational drainage designs, and runoff and sedimentation pond designs reflective of current site conditions.

Recommendation:

Accurate maps for existing site conditions need to be submitted. The representative for the Horizon Mine has indicated that new maps from an updated survey will be forth coming to respond to N97-45-1-1. This survey information will probably result in a complete re-analyses and review of the drainage plans for this site. It is recommended that the culvert extension be installed to facilitate final site configuration, and to preclude conflicts in review, since, submitted information will require additional review based on these maps. These changes should be coordinated in a schedule with the operator to arrive at an accurate account of final watershed drainages and final operational site configuration. Finally, the pages from each submittal need to be combined, replacing appropriate overlapping sections.



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

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October 31, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH* for Joe Helfrich

FROM: Susan White, Senior Reclamation Biologist *SW*

RE: Culvert Extension - Round 2, Horizon Coal Corporation, Horizon Mine, ACT/007/020-97D, Folder #2, Carbon County, Utah

SUMMARY:

A permit change application was received September 18, 1997 from Horizon Coal Company requesting a 100 foot extension of the existing culvert which contains Jewkes Creek. The Division responded to this application with deficiencies and the Operator responded October 17, 1997. This current memo reviews the October 17, 1997 submittal. The application did not adequately address the vegetative success standards of the wet meadow/wetlands/riparian community as previously directed and therefore should not be approved. Sections of this Technical Analysis have been taken from the Technical Analysis for the current approved permit.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

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

VEGETATION RESOURCE INFORMATION

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

Analysis:

The Horizon permit area covers eight vegetative communities (page 9-2). The Oakbrush and Salina Wildrye communities combined make up over half the total acreage of the

eight communities (Plate 9-1). The proposed new disturbance will be on areas that have been previously impacted by coal mining activities. Various degrees of mining-related impacts have occurred on the vegetation within the proposed disturbance. Therefore, the communities have been designated as: 1) slightly disturbed (altered) drainage bottoms; 2) moderately disturbed areas; 3) severely disturbed areas; and 4) wet meadow/wetlands/riparian. Prior to disturbance, the drainages were probably dominated by sagebrush/grass/rabbitbrush communities with aspen, Oakbrush and fir in the deeper and more protected drainages. The slopes surrounding the drainages and valleys are now dominated by Oakbrush and Salina wildrye communities (page 9-12). No map or description was provided in the original permit or permit application 97D which delineates the location of the vegetation communities within or adjacent to the disturbed area boundary.

The total living cover for all areas, excluding the wet meadow, was 48 percent. The most prevalent species in total cover and frequency was rubber rabbitbrush which comprised 22 percent of the total cover. Other dominant species included Salina wildrye, cheatgrass, big sagebrush, and mutton grass.

The Soil Conservation Service estimates that premining forage production rates were 950 lbs per acre for the sagebrush/grass/rabbitbrush communities, 900 lbs per acre for the Oakbrush/salina wildrye communities and 1500 lbs per acre for the semi-wet meadow (page 9-9).

In the course of a wetlands determination site visit in August 1995, Rick Smith, of the Engineering Planning Group determined that a wetland exists at the proposed site of the sediment pond. A map of the wetlands was prepared by Rick Smith and is shown in Appendix 9-2. The wetland/riparian area is approximately .42 acres in size (page 9-7). Further study and delineation was to be done as part of an application for approval to alter the wetland which was made to the U.S. Army Corps of Engineers (page 9-6). After looking at soil samples from the wetland the Army wanted the Division of Water Rights to visit the site and make a wetlands determination. Water Rights determined that the area was a riparian area and not considered a wetland. This statement should be qualified and restated that the area is not an Army Corp jurisdictional wetlands. Riparian areas are considered to be a type of wetlands. Appendix 9-2, Surveyed Riparian Area delineates the disturbed area boundary with the 1995 Rick Smith survey of potential wetlands and the 1996 Patrick Collins wet meadow community study.

In the summer of 1996, Patrick Collins, Mt. Nebo Scientific, Inc., quantitatively sampled the wetland for the purposes of establishing a bond release standard. Dr. Collins describes the area as a riparian/wet meadow with 71 percent vegetative cover. The study area included the wet, mesic and dryer vegetation of the meadow area (Appendix 9-2, page 2). The cover in the area was dominated by grass and grasslike species with perennial ryegrass

comprising 21 percent of the cover. Native perennial species were present in the sampled wet meadow such as redtop, bluegrass long style rush, horsetail and sandbar willow. However, other species present reveal that the area is disturbed and in poor condition such as thistle, poverty weed, and perennial ryegrass.

Findings:

Information provided in the plan meets the minimum requirements of this section.

OPERATION PLAN

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.

The Permittees discussion on minimizing potential impact to fish and wildlife from the mining operation is on page 3-34 and 3-35. The first impact is loss of habitat and since the area is small the impact should be minimal. The previously disturbed area has mostly revegetated and provides food, shelter and cover to resident wildlife. The DWR estimates that 327 acres of critical deer winter range will be lost due to increased traffic along the haul route (county road).

The Permittee states that to minimize adverse impacts to the fish and wildlife of the area an employee awareness program will be initiated to reduce wildlife harassment and road kills. The Permittee recognizes the potential for big game kill through the Wildlife Management Area (page 10-35) and has committed to controlled speed limits. Horizon has committed to monitoring road kills and reporting numbers weekly to the DWR; and agrees to remove killed deer and elk from the road between the Wildcat Coal Loadout and the mine site.

A wildlife monitoring program is to be conducted throughout the operation life of the mine by an environmental specialist (page 3-37), as required by the Division.

A mitigation and enhancement plan for the operations phase of mining is to establish a riparian vegetation community along the lower portion of Jewkes Creek. This portion of the creek, below the sediment pond was relocated after a storm event in 1997. Developing a

riparian community below the mine may help reduce wind blown fines from entering Gordon Creek.

Findings:

Information regarding this section was found to meet the minimum regulatory requirements of this section.

RECLAMATION PLAN

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:

Standards for Success.

As previously stated all, if not most, of the entire operational area has been previously disturbed by mining and not reclaimed to the requirements of the Utah Coal Mining rules. Therefore, the revegetation success standard for bond release is that the vegetative ground cover will be not less than the ground cover existing before redisturbance and adequate to control erosion.

Several vegetative studies have been conducted within the area of the proposed disturbance. Two studies, 1991 and 1995, are presented and included in Appendix 9-1 of the application to use as a bond release standard for the Portal Canyon area of the disturbance. Total vegetative cover averaged 48 and 55 percent cover in 1991 and 1995, respectively. Perennial, nonweedy cover averaged 45 and 49 percent vegetative cover in 1991 and 1995, respectively. Unpaired, nonparametric comparisons of two samples based on rank showed that the 1991 and 1995 nonweedy, perennial cover was not significantly different; however, the 1991 and 1995 total cover were significantly different. Two sample comparisons using the normal distribution showed no significant difference in either total or perennial cover. Raw data is presented in Appendix 9-1.

The locations of the transects are illustrated on Plate 9-1. Transects B and D are shown as going outside of the disturbed area. Original photographs of the transects indicate that

the transects are actually within the disturbed area and this is acceptable to the Division.

The Permittee proposes to use the 1995 baseline study as the standard for success for all areas except the wet meadow/wetland/riparian area. Since the 1991 and 1995 nonweedy, perennial cover was not significantly different then this success standard is acceptable to the Division. Page 9-8 also commits to the same diversity of shrubs, forbs, and grasses as the 1995 study. A commitment is made for the 80/60 tree and shrub standard rule, although this is not required for a prelaw site. However, this commitment will ensure that the postmining land use standard is being met.

Another study to establish baseline data was conducted in the wetland/wet meadow/riparian area in 1996 (Appendix 9-2). Total living cover was 71%, which will be considered the success standard for bond release. Other standards to be met are diverse, effective and permanent vegetative cover which are compatible with the postmining land use. Therefore, the plant species established along Jewkes Creek wet meadow area will have to have wetland characteristic to be considered successful.

The Operator commits to meeting the reclamation standards of the riparian/wet meadow/wetland as shown on map Appendix 9-2 within an area of .42 acres. The area shown by the Collins survey and which the standard is based is approximately 2 acres. The area of exact responsibility to meet the success standard for the riparian/wet meadow/wetland area must be clearly defined.

A typical cross section of the reclaimed channel for Jewkes Creek shown in Figure 7-12 and provides for a 8 foot wide channel and a 30 foot wide flood plain. Check dams will be placed in the reclaimed channel in several locations (Plate 3-7) to encourage upstream sediment to be deposited in the channel. The sedimentation in the channel from the check dams and low flow gradient hopefully will provide the necessary hydrology and soil conditions to reestablish the wet meadow vegetation.

The period of intended responsibility will be ten years. Vegetation will be quantitatively measured in years 2, 3, 5, 9, and 10 following revegetation (page 9-10).

This is a previously-mined site and although some areas are considered severely disturbed, the Permittee has committed to clean and remove the old spoil material from the site. Some areas were less severely impacted and the topsoil has remained in place with minimal surface disturbance. Adequate topsoil will be salvaged from these areas to use on the more severely impacted areas. The proposed mine site is located in a canyon bottom at approximately 7600 feet elevation with average annual precipitation between 16 and 20 inches. All of these factors, along with the revegetation efforts, should allow the Permittee to meet and exceed the

performance standards in all areas except for the wet meadow/riparian area.

Findings:

The permit does not meet the minimum regulatory requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-301-356, the area which is required to meet the vegetation success standard for the riparian/wet meadow/wetland is not clearly represented in the text or map, Appendix 9-2 in Chapter 9. The text and/or map must be revised to clearly define the success standard for this vegetation community.

RECOMMENDATION

Prior to approval the requirement of R645-301-356 must be provided as outlined above.



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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801-538-7223 (TDD)

October 30, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor *gk for Joe Helfrich*

FROM: Robert Davidson, Soils Reclamation Specialist *RAD*

RE: UC-3 Culvert Extension, Horizon Coal Corporation, Horizon Mine, ACT/007/020-97D, Folder #2, Carbon County, Utah

SYNOPSIS:

Horizon Coal Corporation has submitted an amendment for extending Culvert UC-3 100 feet northward. The 36 inch, UC-3 culvert currently carries Jewkes Creek beneath the lower pad area and around the sedimentation pond. The purpose for the culvert extension is to alter the truck turnaround radius, thus enlarging the lower facilities pad for safety reasons.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

SOILS RESOURCE INFORMATION

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

Analysis:

The culvert extension amendment contains significant information regarding the soils environmental resources as follows:

- Affected Area Boundary Map
- Soils Description

Affected Area Boundary Map

The disputed area for the culvert extension lies northward of the current disturbed area boundary as shown in the approved MRP and on photographs (see Figure 1 of this TA memo) taken during construction last fall, 1996. The placement of the disturbed boundary marker as shown in Figure 1 is consistent with the marked disturbance boundary as shown in the original approved Mine Reclamation Plan. However, Horizon claims this area as part of the established disturbance area because of errors in surveying that were corrected during a survey performed during the summer of 1997. Drawing A, Appendix 3-9, shows the revised disturbance boundary as it exists in the field after the 1997 survey.

Soils Description

Since the culvert extension falls within the surface disturbance boundary, soil resource information for the proposed disturbance may be represented by the currently approved Mine Reclamation Plan (MRP). Two soil pits were excavated in the lower facilities area during the 1996 soils investigation. The first pit was located in the bottom of Jewkes Creek channel while the second pit was located on top of the west bank of the Jewkes Creek drainage. In both locations soils were shown to be previously disturbed with past mining activity. The upper 5 feet of soils in the west bank have been previously disturbed and/or imported while the Jewkes Creek soils contained inter-bed layers of coal fines and stream deposited sediment. Sample results indicate that soils in both areas are acceptable as substitute topsoil and/or backfill with the exception of the coal fines layer in the Jewkes Creek channel.

The Jewkes Creek channel soils are unique since they have a fluvial origin which terminate at bed rock located 12 feet down. The material consists mainly of sandy loam inter-bedded with coal fines ($\approx 30\%$) and loam with a high bedding angle. The Jewkes Creek soils contain less than 10 percent rocks with no coarse fragments. Furthermore, the Jewkes Creek soils were shown to have hydric development associated with the riparian environment.

Findings:

The information provided meets the regulatory requirements of this section.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

The UC-3 culvert extension project covers the following operational considerations for soil salvage and protection of the soil resource:

- UC-3 Culvert Extension Soil Salvage Locations
- Soil Specialist Supervision
- General Soil Salvage Considerations
- Jewkes Creek Soils - Special Considerations
- Soil Salvage Updates

UC-3 Culvert Extension Soil Salvage Locations

The amendment gives reference to salvaging soils (Area 12, Figure 8-2) from the bottom of Jewkes Creek and along the adjacent hillsides. Jewkes Creek soil salvage (≈ 1.5 ft depth) includes soils located beneath and immediately adjacent the proposed culvert where the channel will be filled and compacted. The east hillside disturbance will be limited, but all available soil medium on the west hillside (≈ 4 ft depth) will be salvaged. The total volume of soil salvage is estimated at 660 CY.

Soil Specialist Supervision

The current approved MRP requires that a qualified soils specialist be on site during soil salvage operations. Consistent with this requirement, Horizon commits to having a soils specialist from either UDOGM or the Natural Resource Conservation Service (NRCS) supervise the soils salvage during the culvert extension project.

General Soil Salvage Considerations

The vegetative cover will be removed with and incorporated into the topsoil prior to stockpiling. Trash, concrete, and debris will be hauled to a properly licensed disposal facility as it is removed from the mine site during topsoil removal (page 8-23).

The amendment states that a portion of the soil salvaged from the hillsides during culvert installation will be placed (to an approximate 6 inch depth) on a slope adjacent to the culvert. The adjacent slope is located beside the upper pad area access road (Plate A, Appendix 8-1) and is designated as interim reclamation. The remaining topsoil/growth medium salvaged will be placed on the topsoil stockpile.

Jewkes Creek Soils - Special Considerations

Since the Jewkes Creek channel soils are unique in their fluvial origin in supporting the riparian/wet meadow vegetation which currently exists on site, these soils need special consideration for salvage and storage for later reclamation use. Therefore, soils salvaged from the bottom of Jewkes Canyon will be segregated, dried, and identified as soil to be returned to the bottom of Jewkes Canyon during final reclamation.

Soil Salvage Updates

Table 8-3 is updated to reflect the additional 660 CY of soil salvaged from area 12, the culvert expansion area; total soil salvaged from Horizon now shows as 14,330 CY. In addition, Figure 8-2, Growth Medium Removal Locations, has been revised to show Area 12.

A new table, Topsoil/Growth Medium Recovery and Placement Calculations, is located in Appendix 8-1. The surveyed volume of soil medium in the stockpile is estimated at 10,993 CY. Information in the table, Appendix 8-1 is unclear for the following reasons:

- *The surveyed quantity (10,993 CY) of soil medium recovered in 1996 differs markedly from the actual topsoil stockpile volume of 15,312 CY and a compaction corrected volume of 13,741 CY (includes Area 10 & 11 and calculated from the report submitted by EathFax to Horizon, Appendix 8-1, Soil Salvage Practices Fall 1996, December 15, 1996). A soil stockpile deficit of 2,748 CY therefore exists and an accurate accounting of the soil resources is necessary for the Division to accurately evaluate these reported results and operation activities at the Horizon Mine:*
 - *Horizon must account for the 2,748 CY soil deficit?*
 - *Was this soil used as fill during portal construction or repair of the broken*

culvert (see field report 9/9/97, Topsoil Stockpile Disturbance)?

- *Does this difference take into account the soil removed from the stockpile while repairing the crushed culvert?*
- *When were these surveys performed?*

- *Footnote (b) states that the surveyed amount (10,933 CY) excludes the hill located on the left side of Portal Canyon below the topsoil stockpile which will remain during reclamation. This "hill" presents some perplexing questions that need to be answered in order for the Division to determine the accuracy of this table:*
 - *The phrase "left side of Portal Canyon" is unclear and does not designate which direction (north, south, etc.). The assumption is north, northwest.*
 - *Does this "undisturbed" hill contain soil that should have been salvaged?*
 - *If soil was left, why is this soil part of the recovery and placement calculations?*
 - *Photographs from last fall (Figure 2 of this TA) show that all north, northwest hills located adjacent, immediately above the Portal Canyon pad and below the soil stockpile were disturbed during the 1996 fall construction period. Figure 8-2 clearly shows that no soil was salvaged from these slopes, yet the photograph (TA Figure 2) clearly shows that these hillsides were affected during construction. Therefore, if these slopes were affected during construction, why wasn't soil salvaged?*
 - *Since the amendment states that the hill will remain undisturbed, how can this statement be rectified since these north, northwest hills were disturbed?*
- *The meaning of "Soil Medium Placed" in 1997 is unclear. The assumption is that this statement refers to soil removed from the stockpile and placed in contemporaneous reclamation areas as shown on Plate A, Appendix 8-1. When, where, what and why was this soil placed? Provide affected acreage and placement depths?*
- *The meaning of "Potential Soil Medium to be Placed" for 1997 is unclear. Is this the 6" of interim soil placed during the culvert extension? Acreage and depths?*
- *Footnote (d) states that soil replacement depth will increase from 11" to 14" during reclamation. It is unclear how the "14 inches" was calculated.*
 - *Is this replacement depth based on the survey volume of 10,818 CY?*
 - *Which disturbed acreage is being used for this calculation, the 9.15 or the 8.23 acres as referenced in Appendix 3-9? Section 8.8, Plans for Redistribution of Soils," states that the "14 inches" of topsoil/growth medium is based on the total available medium divided by the total disturbed area.*

Appendix 3-9, UC-3 Culvert Extension, states that the permit will continue to reflect 9.15 acres of disturbance. Based on these facts and using the 10,818 CY of surveyed soil, the replacement depth is 9.8 inches, not 14 inches.

Findings:

R645-301-120. The new table, Appendix 8-1, Topsoil/Growth Medium Recovery and Placement Calculations, shows a soil stockpile deficit of 2,748 CY. An accurate accounting of the soil resources and information presented in the table is necessary for the Division to determine if the information is accurate and correlates with past operational activities. Please answer all concerns outlined in the Operations Analysis section listed above.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

The reclamation portion of the culvert extension amendment contains the following items that are either discussed or still need additional corrections:

- Jewkes Creek Riparian Soils
- Soil redistribution
- Contemporaneous and Interim Reclamation

Jewkes Creek Riparian Soils

Since a portion of this disturbance is a riparian area, the commitments within the Horizon permit concerning riparian reclamation will apply. These commitments include replacement of the riparian soil salvaged from the Jewkes Creek riparian area as referenced in Appendix 8-1, Soil Salvage Practices Fall 1996 report submitted on December 15, 1996 to Horizon Coal Corporation from EarthFax Engineering which states the following commitment on Page 2:

“Topsoil from Area 1, the designated riparian area, was collected and stored at the front of the topsoil pile, the southwestern corner, to be utilized for reestablishment of riparian vegetation during reclamation.”

Soil resources salvaged from Jewkes Creek will be redistributed to Jewkes Creek during final reclamation.

Soil Redistribution

Soils and fill material disturbed during mining will be placed within the disturbed area boundary. This is consistent with the current approved MRP which contains numerous references concerning fill placement against cut slopes and high walls. During reclamation, fill excavation will be required from Portal Canyon and Jewkes Creek facility pad areas for achieving the approved channel design and reclamation contours.

Contemporaneous and Interim Reclamation

Plate A, Appendix 8-1 illustrates contemporaneous and interim reclamation areas for the Horizon surface facility areas. Contemporaneous reclamation areas include the following:

- Soils brought on-site and placed by Hidden Splendor Resources from the county road realignment. Soil placement is 10 to 12 inches, but the volume is not listed.
- Soils redistributed from the topsoil stockpile during the construction of the portal entries and subsequent repair of a crushed culvert beneath the stockpile. Soil placement is 10 to 12 inches.

Interim reclamation areas include:

- Soils from the proposed UC-3 culvert extension. Soil placement is 6 inches.

Findings:

The information provided meets the regulatory requirements of this section. However, additional concerns and ramifications of soil redistribution during contemporaneous and interim reclamation activities are contained in a Notice of Violation, N97-45-1-1 issued on September 18, 1997. NOV abatement requires an amendment to the existing Mine Reclamation Plan which will alter information contained in this, the UC-3 culvert extension amendment.

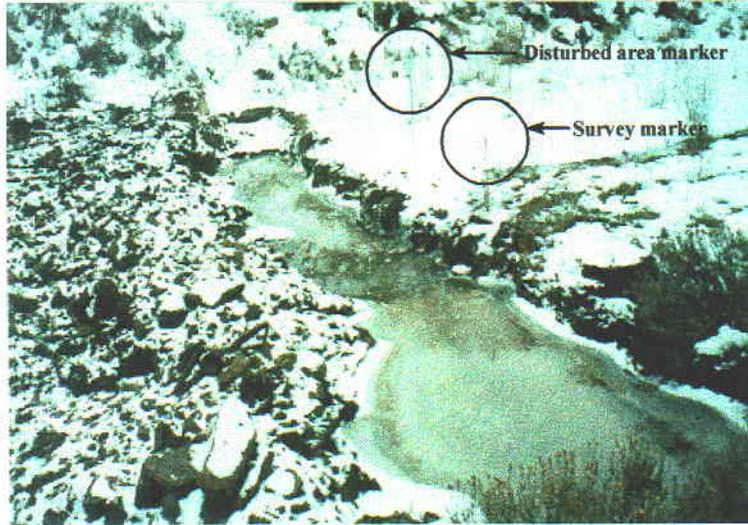


Figure 1. 10/30/96, Horizon Mine. ACT/007/020 on-site inspection . DOGM personnel - Susan White, Sharon Falvey and Robert Davidson. The upper Jewkes Creek disturbance area boundary is shown by the white disturbance marker and the orange survey stake. Jewkes Creek is draining into the excavated ditch that crosses the upper end of the meadow area with the Jewkes Creek located outside the marked disturbance area. The disturbance boundary sign and survey stake are located in the center of the drainage, just above the ditch and adjacent to the Creek. This photograph showing the placement of the disturbed boundary marker is consistent with the marked disturbance boundary as shown in the original approved Mine Reclamation Plan maps.



Figure 2. 11/13/96, Horizon Mine. ACT/007/020 on-site inspection . DOGM personnel - Robert Davidson and Paul Baker. North, northwest cut slopes created during fall, 1996 construction. Photo taken from the base of the soil stockpile, looking down Portal Canyon. The entire slope from the base of the stockpile to the mouth of Portal Canyon has been affected.

Horizon Coal Corporation
P.O. Box 599
Helper, UT 84526

ACT/007/020 #2
ACT/007/020-
97D

October 16, 1996

Mr. Daron Haddock
Utah Division of Oil, Gas & Mining
1584 West North Temple
Suite 1210
Salt Lake City, Utah 84114-5801

Subject: Culvert Extension 97D, Horizon Coal Company, Horizon Mine
ACT/007/020-97D

Dear Mr. Haddock:

Attached please find six copies of revisions to the Horizon Mine M&RP. These revisions are submitted in support of the proposed extension of culvert UC-3 at the mine and to fulfill the requirements of:

- A letter from the Division to Horizon dated September 11, 1997 and
- A Technical Analysis, dated October 3, 1997, of a prior submittal concerning the culvert extension.

The attached information covers the following:

- Revisions to Chapter 3 of the M&RP,
- Revisions to Chapter 8 of the M&RP, and
- Revisions to Chapter 9 of the M&RP.

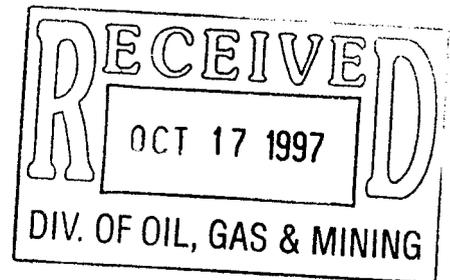
The revisions include text, figures, appendices, and plates.

Please contact me if you have any questions.

Sincerely,

Richard Swartz for

Vicky S. Bailey
Permitting Consultant, EarthFax Engineering, Inc.





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

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October 8, 1997

Vicky Bailey
Horizon Coal Company
7324 South Union Park Avenue
Midvale, Utah 84047

Re: Extension of Culvert UC-3 and Adjacent Disturbed Area Boundary, Horizon Coal Company, Horizon Mine, ACT/007/020-97D, File #2, Carbon County, Utah

Dear Ms. Bailey:

The Division staff Jess Kelley, Sharon Falvey, Susan White, and Bob Davidson have completed their review of the referenced amendment. Please address the regulatory requirements noted in the findings sections of the staff's technical memos by October 23, 1997.

If you have any questions please call.

Sincerely,

A handwritten signature in cursive script that reads "Joseph C. Helfrich".

Joseph C. Helfrich
Permit Supervisor

tat

Enclosure

cc: Bill Malencik w/enc.

O:\007020.HZN\FINAL\DEFICIEN.97D



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

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October 3, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Susan White, Senior Reclamation Biologist *SMW*

RE: Culvert Extension, Horizon Coal Corporation, Horizon Mine, ACT/007/020-97D, Folder #2, Carbon County, Utah

SUMMARY:

A permit change application was received September 18, 1997 from Horizon Coal Company requesting a 100 foot extension of the existing culvert which contains Jewkes Creek. The culvert extension will disturb additional high value habitat within the wet meadow/wetlands/riparian community. The application did not adequately address the vegetative resources or enhancement plans of the wet meadow/wetlands/riparian community and therefore should not be approved. Sections of this Technical Analysis have been taken from the Technical Analysis for the current approved permit. Changes to the current Technical Analysis other than those in the Findings have been underlined.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

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

VEGETATION RESOURCE INFORMATION

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

Analysis:

The Horizon permit area covers eight vegetative communities (page 9-2). The Oakbrush and Salina Wildrye communities combined make up over half the total acreage of the eight communities (Plate 9-1). The proposed new disturbance will be on areas that have been previously impacted by coal mining activities. Various degrees of mining-related impacts have occurred on the vegetation within the proposed disturbance. Therefore, the communities have been designated as: 1) slightly disturbed (altered) drainage bottoms; 2) moderately disturbed areas; 3) severely disturbed areas; and 4) wet meadow/wetlands/riparian. Prior to disturbance, the drainages were probably dominated by sagebrush/grass/rabbitbrush communities with aspen, Oakbrush and fir in the deeper and more protected drainages. The slopes surrounding the drainages and valleys are now dominated by Oakbrush and Salina wildrye communities (page 9-12). No map or description was provided in the original permit or permit application 97D which delineates the location of the vegetation communities within or adjacent to the disturbed area boundary.

The total living cover for all areas, excluding the wet meadow, was 48 percent. The most prevalent species in total cover and frequency was rubber rabbitbrush which comprised 22 percent of the total cover. Other dominant species included Salina wildrye, cheatgrass, big sagebrush, and mutton grass.

The Soil Conservation Service estimates that premining forage production rates were 950 lbs per acre for the sagebrush/grass/rabbitbrush communities and 900 lbs per acre for the Oakbrush/salina wildrye communities (page 9-7). No production estimates were provided for the wet meadow/wetlands/riparian community from the National Resource Conservation Service.

In the course of a wetlands determination site visit in August 1995, Rick Smith, of the Engineering Planning Group determined that a wetland exists at the proposed site of the sediment pond. A map of the wetlands was prepared by Rick Smith and is shown in Appendix 9-2. The wetland/riparian area is approximately .42 acres in size (page 9-7). Further study and delineation was to be done as part of an application for approval to alter the wetland which was made to the U.S. Army Corps of Engineers (page 9-6). After looking at soil samples from the wetland the Army wanted the Division of Water Rights to visit the site and make a wetlands determination. Water Rights determined that the area was a riparian area and not considered a wetland. This statement should be qualified and restated that the area is not an Army Corp jurisdictional wetlands. Riparian areas are considered to be a type of wetlands. Another map was provided with permit change 97D, titled Appendix 9-2, Surveyed Riparian Area. This map incorporates the disturbed area boundary with the 1995 Rick Smith survey of potential wetlands that were subsequently determined to be a riparian area by the Division of Water Rights. This

map must be removed or retitled so that it is clear that this map actually depicts the 1995 Rick Smith survey and not the 1996 Patrick Collins riparian community study.

In the summer of 1996, Patrick Collins, Mt. Nebo Scientific, Inc., quantitatively sampled the wetland for the purposes of establishing a bond release standard. Dr. Collins describes the area as a riparian/wet meadow with 71 percent vegetative cover. The study area included the wet, mesic and dryer vegetation of the meadow area (Appendix 9-2, page 2). The cover in the area was dominated by grass and grasslike species with perennial ryegrass comprising 21 percent of the cover. Native perennial species were present in the sampled wet meadow such as redtop, bluegrass long style rush, horsetail and sandbar willow. However, other species present reveal that the area is disturbed and in poor condition such as thistle, poverty weed, and perennial ryegrass. No map was provided with this study which describes the boundaries of the wet meadow community within the new disturbed area and within the existing disturbed area.

Findings:

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

R645-301-321.100, a map which illustrates the vegetative communities of the disturbed and adjacent areas prior to the current operations disturbance must be provided. The area sampled in the Collins 1996 Riparian Community must be included in this map. The map submitted with permit change 97D, Appendix 9-2, Surveyed Riparian Area, must be remove or somehow labeled as the 1995 Rick Smith wetlands survey.

R645-301-321.200, the productivity of the wet meadow/wetlands/riparian community must be provided.

OPERATION PLAN

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.

The Permittees discussion on minimizing potential impact to fish and wildlife from the mining operation is on page 3-34 and 3-35. The first impact is loss of habitat and since the area is small the impact should be minimal. The previously disturbed area has mostly revegetated and provides food, shelter and cover to resident wildlife. The DWR estimates that 327 acres of critical deer winter range will be lost due to increased traffic along the haul route (county road).

The Permittee states that to minimize adverse impacts to the fish and wildlife of the area an employee awareness program will be initiated to reduce wildlife harassment and road kills. The Permittee recognizes the potential for big game kill through the Wildlife Management Area (page 10-35) and has committed to controlled speed limits. Horizon has committed to monitoring road kills and reporting numbers weekly to the DWR; and agrees to remove killed deer and elk from the road between the Wildcat Coal Loadout and the mine site.

A wildlife monitoring program is to be conducted throughout the operation life of the mine by an environmental specialist (page 3-37), as required by the Division.

The original permit issued to Horizon Coal Co. was approved with the following protection and enhancement plan:

The undisturbed wet meadow/riparian areas below the sediment pond will be maintained and protected from disturbance by fencing the area at the time of facility construction and thereafter until final bond release. The fence will extend from the bottom of the sediment pond to County Road 290. Horizon commits to maintain the riparian vegetation within the fenced area, insuring its continued growth and development by continuing its source of water and by non-disturbance.

This statement in the permit was stamped superseded July 11, 1997. The following is the statement currently in the permit dated July 11, 1997.

The undisturbed wet meadow/riparian area below the sediment pond will be maintained and protected from disturbance by fencing the area at the time of facility construction and thereafter until final bond release. Horizon commits to maintain the riparian vegetation within the fenced area, insuring its continued growth and development by continuing its source of water and by non-disturbance.

This statement was replaced when amendment 97C was approved. Amendment 97C was reported to address the reclamation plan for Jewkes Creek and not operational protection and enhancement plans. The following statement is contained in the current Technical Analysis attached to the Permit.

The Operator has committed to fencing and maintaining the riparian zone from the sediment pond to County Road 290 (page 9-6) as mitigation for the disturbance.

This permit change was undetected when the page was replaced July 11, 1997. This commitment to protect the riparian area to County Road 290 must be put back into the permit as a protection and enhancement plan for the current disturbed area and amendment 97D. The Division realizes that this area is now disturbed and the Jewkes Creek channelized, however the area will need to be revegetated and protected.

Findings:

Information regarding this section was not found to meet the minimum regulatory requirements. Prior to approval, the permittee must provide the following in accordance with:

R645-301-333.100, the application must detail the protection, enhancement, restoration, and replacement of the wet meadow/wetland/riparian community for the culvert extension and the current disturbed area. The permittee must replace the statement to fence the high value habitat from the sediment pond to County Road 290.

RECLAMATION PLAN

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:

Standards for Success.

As previously stated all, if not most, of the entire operational area has been previously disturbed by mining and not reclaimed to the requirements of the Utah Coal Mining rules. Therefore, the revegetation success standard for bond release is that the vegetative ground cover will be not less than the ground cover existing before redisturbance and adequate to control erosion.

Several vegetative studies have been conducted within the area of the proposed

disturbance. Two studies, 1991 and 1995, are presented and included in Appendix 9-1 of the application to use as a bond release standard for the Portal Canyon area of the disturbance. Total vegetative cover averaged 48 and 55 percent cover in 1991 and 1995, respectively. Perennial, nonweedy cover averaged 45 and 49 percent vegetative cover in 1991 and 1995, respectively. Unpaired, nonparametric comparisons of two samples based on rank showed that the 1991 and 1995 nonweedy, perennial cover was not significantly different; however, the 1991 and 1995 total cover were significantly different. Two sample comparisons using the normal distribution showed no significant difference in either total or perennial cover. Raw data is presented in Appendix 9-1.

The locations of the transects are illustrated on Plate 9-1. Transects B and D are shown as going outside of the disturbed area. Original photographs of the transects indicate that the transects are actually within the disturbed area and this is acceptable to the Division.

The Permittee proposes to use the 1995 baseline study as the standard for success for all areas except the wet meadow/wetland/riparian area. Since the 1991 and 1995 nonweedy, perennial cover was not significantly different then this success standard is acceptable to the Division. Page 9-8 also commits to the same diversity of shrubs, forbs, and grasses as the 1995 study. A commitment is made for the 80/60 tree and shrub standard rule, although this is not required for a prelaw site. However, this commitment will ensure that the postmining land use standard is being met.

Another study to establish baseline data was conducted in the wetland/wet meadow/riparian area in 1996 (Appendix 9-2). Total living cover was 71%, which will be considered the success standard for bond release. Other standards to be met are diverse, effective and permanent vegetative cover which are compatible with the postmining land use. Therefore, the plant species established along Jewkes Creek wet meadow area will have to have wetland characteristic to be considered successful.

As discuss in the **VEGETATION RESOURCE INFORMATION** section of this technical analysis inadequate information is provided to determine the exact boundaries of the Collins 1996 survey for determining the success standards for the current disturbed area and that proposed in permit application 97D. After the correct resource information is approved then the success standards will need to be changed to reflect the actual predisturbance conditions.

A typical cross section of the reclaimed channel for Jewkes Creek shown in Figure 7-12 and provides for a 8 foot wide channel and a 30 foot wide flood plain. Check dams will be placed in the reclaimed channel in several locations (Plate 3-7) to encourage upstream sediment to be deposited in the channel. The sedimentation in the channel from the check dams and low flow gradient hopefully will provide the necessary hydrology and soil conditions to reestablish the wet

meadow vegetation.

The period of intended responsibility will be ten years. Vegetation will be quantitatively measured in years 2, 3, 5, 9, and 10 following revegetation (page 9-10).

This is a previously-mined site and although some areas are considered severely disturbed, the Permittee has committed to clean and remove the old spoil material from the site. Some areas were less severely impacted and the topsoil has remained in place with minimal surface disturbance. Adequate topsoil will be salvaged from these areas to use on the more severely impacted areas. The proposed mine site is located in a canyon bottom at approximately 7600 feet elevation with average annual precipitation between 16 and 20 inches. All of these factors, along with the revegetation efforts, should allow the Permittee to meet and exceed the performance standards in all areas except for the wet meadow/riparian area.

Findings:

The permit does not meet the minimum regulatory requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-301-356, the vegetative communities existing prior to the current disturbance have not been adequately mapped as discuss in the **VEGETATION RESOURCE INFORMATION** and associated **Findings** section in this technical analysis. After maps have been corrected the vegetation success standards must be revised to reflect the pre-current mining conditions.

RECOMMENDATION

Prior to approval the requirement of R645-301-300 must be provided as outlined above.



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

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October 3, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Sharon Falvey, Senior Reclamation Specialist *SF*

RE: Culvert Extension 97D, Horizon Coal Company, Horizon Mine, ACT/007/020-97D
9/897 and 9/30/97, Folder #2, Carbon County, Utah.

SYNOPSIS

This amendment, received on September 18, 1997 and September 30, 1997 is reviewed and deficiencies are noted. Applicable portions of the T.A. will be incorporated in the final approval. Although the proposal it's self does not represent a major change to the plan. The change in the disturbed area and contour information will require updates to all applicable maps in the MRP.

ANALYSIS

OPERATION PLAN

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:

Diversions.

Additional information on the extension to UC-3 is provided in Appendix 3-9. Culverts UC-1 and UC-3 receive drainage coming from the Jewkes Creek, an intermittent stream, designed to carry the flow from a 100-year, 6-hour event. This extension does not negatively affect the capacity of the existing stream channel culvert.

Stream Buffer Zones.

The permittee must demonstrate that all requirements of 742.300 have been met prior to approval and findings of this section (see R645-301-742.322). The permittee is required to provide the stream buffer zones and assure they are adequately marked during the channel construction. The text indicates buffer zone signs will be placed adjacent to Jewkes Creek, a sign must also be placed at the upstream boundary of the buffer zone. This is a performance standard which will be enforced in the field.

The permittee has provided a copy of the stream alteration permit 97-91-08SA for the proposed extension. This permit expires on August 14, 1998.

Sediment Control Measures.

According to the certified letter from Richard White P.E. in appendix 3-9. The additional disturbed area does not increase the runoff volume to the sedimentation pond because the actual disturbed area is less than that determined in the approved plan. However the increase in undisturbed area runoff draining to the pond was not addressed. Based on the submitted drawing and the watersheds depicted on Plate 7-5 it was estimated that the area has increased by about 0.32 acres. An additional error in watershed area was identified in this review and resulted in the subsequent submittal received on 9/30/97.

To respond to the error, Mr. White submitted a letter justifying the adequacy of existing storage for the additional disturbed error and the watershed area. It was agreed that this would be adequate with changes presented on the map. However, the memo did not include a certification required under R645-301-742.213 and cross reference R645-301-743. Additionally an adequate number of copies of this letter were not submitted. Because the approved plan indicates a disturbed area of 9.15 acres and the actual disturbed area is 8.23 acres it appears that this additional area could be adequate. However the proposed disturbed area and adjacent watershed areas were not adjusted on plate 7-5, therefore, verification of the presented information could not be conducted.

Findings:

The permittee must provide the following, in accordance with the requirements of:

R645-301-731. Provide maps and descriptions containing current information

specific to the local hydrologic conditions. Include the disturbed and undisturbed area watersheds depicted on Plate 7-5, as well as, updated runoff and sedimentation pond designs.

R645-301-742.213 cross reference R645-301-742.213. Provide the required certification for the submitted maps and certified design for the sedimentation pond.

Recommendation:

Accurate maps for existing site conditions need to be submitted. The most recent survey information has been provided on Plate A. The letter to Daron Haddock, contained as part of the amendment indicates that revised copies of Plates 3-1, 3-7 and 7-4 will be submitted once the extension is approved and the county road surveyed. The inaccuracies of previous maps has led to a continual problem with updating and changing the plan and coordinating proposed changes with the permit amendments. It is therefore, recommended that this permit be denied until accurate maps for disturbed watershed areas related to the sedimentation pond design and this culvert extension be submitted prior to approval. It is recognized that these changes will probably result in having to correct the designs for all disturbed area drainage. These changes should be coordinated in a schedule with the operator to arrive at an accurate account of final watershed drainages and final operational site configuration.



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

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Executive Director
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October 3, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Robert Davidson, Soils Reclamation Specialist *RAD*

RE: UC-3 Culvert Extension, Horizon Coal Corporation, Horizon Mine, ACT/007/020-97D, Folder #2, Carbon County, Utah

SYNOPSIS:

Horizon Coal Corporation has submitted an amendment for extending Culvert UC-3 100 feet northward. The 36" culvert currently carries Jewkes Creek beneath the lower pad area and around the sedimentation pond. The purpose for the culvert extension is to alter the truck turnaround radius, thus enlarging the lower facilities pad for safety reasons.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

SOILS RESOURCE INFORMATION

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

Analysis:

The culvert extension amendment contains significant information regarding the soils environmental resources as follows:

- Affected Area Boundary Map
- Soils Description

Affected Area Boundary Map

The disputed area for the culvert extension lies northward of the current disturbed area boundary as shown in the approved MRP and on photographs (see Figure 1 of this TA memo) taken during construction last fall, 1996. The placement of the disturbed boundary marker as shown in Figure 1 is consistent with the marked disturbance boundary as shown in the original approved Mine Reclamation Plan. However, Horizon claims this area as part of the established disturbance area because of errors in surveying that were corrected during a survey performed during the summer of 1997. Drawing A, Appendix 3-9, shows the revised disturbance boundary as it exists in the field after the 1997 survey.

Soils Description

Since the culvert extension falls within the surface disturbance boundary, soil resource information for the proposed disturbance may be represented by the currently approved Mine Reclamation Plan (MRP). Two soil pits were excavated in the lower facilities area during 1996. The first pit was located in the bottom of Jewkes Creek channel while the second pit was located on top of the west bank of the Jewkes Creek drainage. In both locations soils were shown to be previously disturbed with past mining activity. The upper 5 feet of soils in the west bank have been previously disturbed and/or imported while the Jewkes Creek soils contained inter-bed layers of coal fines. Sample results indicate that soils in both areas are acceptable as substitute topsoil and/or backfill with the exception of the coal fines layer in the Jewkes Creek channel.

The Jewkes Creek channel soils are unique since they have a fluvial origin which terminate at bed rock located 12 feet down. The material consists mainly of sandy loam inter-bedded with coal fines ($\approx 30\%$) and loam with a high bedding angle. The Jewkes Creek soils contain less than 10 percent rocks with no coarse fragments. Furthermore, the Jewkes Creek soils were shown to have hydric development associated with the riparian environment.

Findings:

The information provided meets the regulatory requirements of this section.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

The UC-3 culvert extension project covers the following operational considerations for soil salvage and protection of the soil resource:

- Soil Salvage Locations
- Soil Specialist Supervision
- General Soil Salvage Considerations
- Jewkes Creek Soils - Special Considerations
- Soil Salvage Updates Needed

Soil Salvage Locations

The amendment only gives reference to salvaging soils within the Jewkes Creek channel, which includes soils beneath the proposed culvert and soils immediately adjacent where the channel will be filled and compacted. *No commitment or mention is given to salvaging soils from the adjacent hillsides, particularly the hillside that is planned to be removed. As specified in the MRP, all available soils and substitute soils will be salvaged from the adjoining hillsides of Jewkes Creek.*

Soil Specialist Supervision

The current approved MRP requires that a qualified soils specialist be on site during soil salvage operations. Consistent with this requirement, Horizon commits to having a soils specialist from either UDOGM or the Natural Resource Conservation Service (NRCS) supervise the soils salvage during the culvert extension project.

General Soil Salvage Considerations

The vegetative cover will be removed with and incorporated into the topsoil prior to stockpiling. Trash, concrete, and debris will be hauled to a properly licensed disposal facility as it is removed from the mine site during topsoil removal (page 8-23).

The amendment states that a portion of the soil salvaged from the culvert installation will be placed on a slope adjacent to the culvert. The remaining topsoil/growth medium salvaged will be placed on the topsoil stockpile. Since the amendment only specifies soils to be salvaged from the Jewkes Creek riparian area, the assumption is made that these riparian soils will be used to reclaim the adjacent slope to the culvert. *The adjacent slope to receive 6 inches of soil needs to be shown on a map and identified as interim reclamation.*

Jewkes Creek Soils - Special Considerations

Since the Jewkes Creek channel soils are unique in their fluvial origin in supporting the riparian/wet meadow vegetation which currently exists on site, these soils need special consideration for salvage and storage for reclamation use. In the Jewkes Creek area of the proposed sediment pond, all available excavated soils will be salvaged and stored in the stockpile for later reclamation. Soils in the riparian area will be dried prior to salvage and the subsequent inclusion in the topsoil stockpile. These necessary steps will protect these often waterlogged soils from compaction and clod formation during the soil salvage operations.

Soils salvaged from Jewkes Creek need to be segregated in the stockpile, dried and identified for reclamation in the Jewkes Creek riparian area during reclamation. Furthermore, these riparian soils may not be used for interim or contemporaneous reclamation.

Soil Salvage Updates Needed

Table 8-3 shows that all topsoil/growth medium is stored at the top of Portal Canyon in the stockpile. *Table 8-3 needs to be updated to reflect past, current and proposed status of the soil stockpile in terms of soil removal and additions. A new table should reflect total soil salvaged, accurate topsoil stockpile volume, and other soil volumes in areas of interim and contemporaneous reclamation. Furthermore, these areas need to be marked clearly and maintained during the life of the mine to prevent further disturbance or contamination.*

Findings:

R645-301-232 and R645-301-234. Four parts: (1) specify soil salvage from adjacent hillsides; (2) soils salvaged from Jewkes Creek need to be segregated in the stockpile, dried and identified for reclamation in the Jewkes Creek riparian area during reclamation; (3) Jewkes Creek riparian soils may not be used for interim or contemporaneous reclamation; and (4) the adjacent slope to receive 6 inches of soil needs to be shown on a map and identified as interim reclamation.

R645-301-120. Table 8-3 needs to be updated to reflect past, current and proposed

status of the soil stockpile in terms of soil removal and additions. A new table should reflect total soil salvaged, accurate topsoil stockpile volume, and other soil volumes in areas of interim and contemporaneous reclamation. Furthermore, these areas need to be marked clearly and maintained during the life of the mine to prevent further disturbance or contamination.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

The reclamation portion of the culvert extension amendment contains the following items that are either discussed or still need additional corrections:

- Jewkes Creek Riparian Soils
- Soils and Construction Fills
- Inaccurate Page Numbering

Jewkes Creek Riparian Soils

Since a portion of this disturbance is a riparian area, the commitments within the Horizon permit concerning riparian reclamation will apply. These commitments include replacement of the riparian soil salvaged from the Jewkes Creek riparian area as referenced in Appendix 8-1, Soil Salvage Practices Fall 1996 report submitted on December 15, 1996 to Horizon Coal Corporation from EarthFax Engineering which states the following commitment on Page 2:

“Topsoil from Area 1, the designated riparian area, was collected and stored at the front of the topsoil pile, the southwestern corner, to be utilized for reestablishment of riparian vegetation during reclamation.”

Soils salvaged from Jewkes Creek need to be redistributed in the riparian area of

Jewkes Creek. This commitment needs to be added to this permit amendment under section 3-9.6, Soils, to maintain clarity and consistency within the reclamation plan.

Soils and Construction Fills

Horizon further states that soils and fill material disturbed during mining will be placed within the disturbed area boundary. This is consistent with the current approved MRP which contains numerous references concerning fill placement against cut slopes and high walls. During reclamation, fill excavation will be required from Portal Canyon and Jewkes Creek facility pad areas for achieving the approved channel design and reclamation contours.

Inaccurate Page Numbering

The amendment's pages 3-35 and 3-45 are different from the MRP. Material found on these amendment pages is contained in the MRP on pages 3-34 and 3-43.

Findings:

R645-301-142, R645-301-143, R645-301-120, R645-301-130, R645-301-232.100, R645-301-234.220 and R645-301-242.100. Soils salvaged from Jewkes Creek need to be redistributed in the riparian area of Jewkes Creek. This commitment needs to be added to this permit amendment under section 3-9.6, Soils, to maintain clarity and consistency within the reclamation plan.

R645-301-120. The amendment's pages 3-35 and 3-45 are different from the MRP. Material found on these amendment pages is contained in the MRP on pages 3-34 and 3-43.

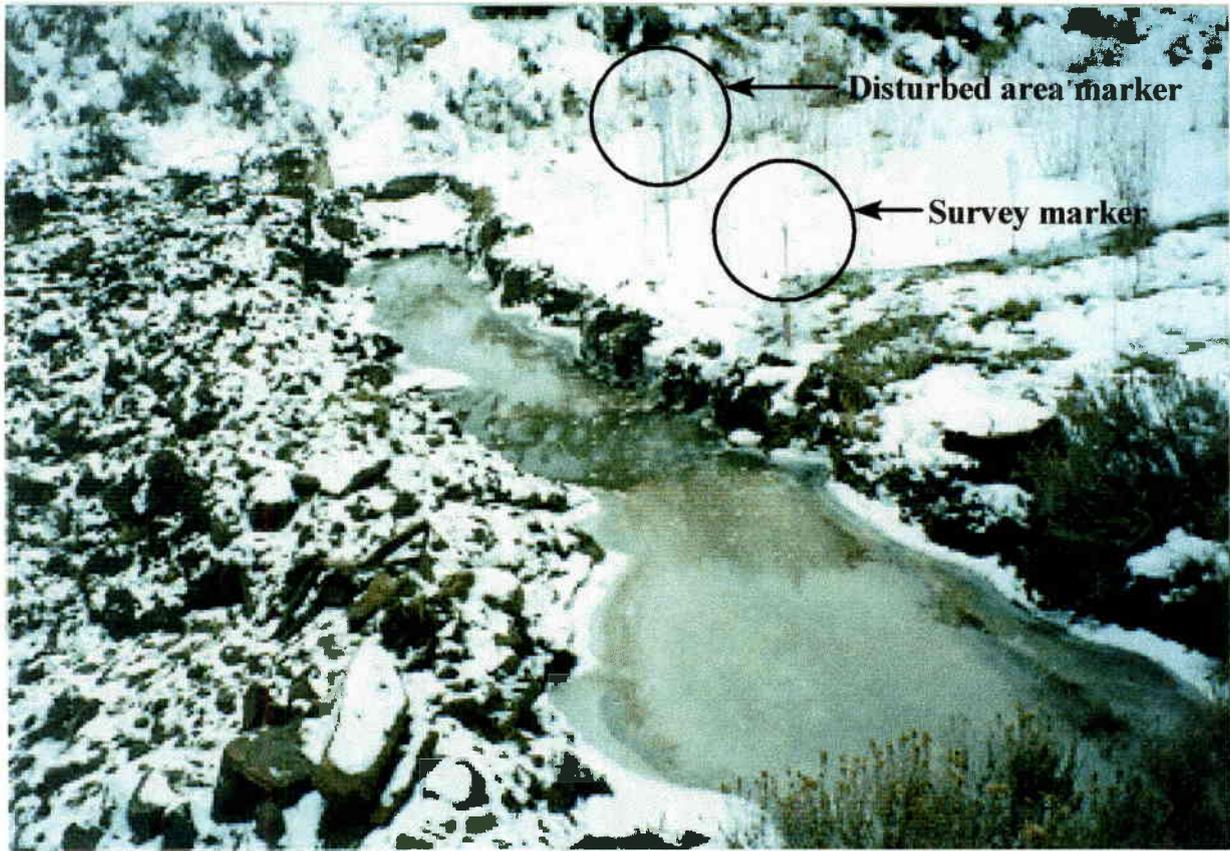


Figure 1. 10/30/96, Horizon Mine. ACT/007/020 on-site inspection . DOGM personnel - Susan White, Sharon Falvey and Robert Davidson. The upper Jewkes Creek disturbance area boundary is shown by the white disturbance marker and the orange survey stake. Jewkes Creek is draining into the excavated ditch that crosses the upper end of the meadow area with the Jewkes Creek located outside the marked disturbance area. The disturbance boundary sign and survey stake are located in the center of the drainage, just above the ditch and adjacent to the Creek. This photograph showing the placement of the disturbed boundary marker is consistent with the marked disturbance boundary as shown in the original approved Mine Reclamation Plan maps.

September 30, 1997

ACT/007/020 #2
ACT/007/020-97D



EarthFax

Ms. Sharon Falvey
Utah Division of Oil, Gas & Mining
1594 West North Temple
Salt Lake City, Utah 84114-5801

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Engineering Inc.
Engineers/Scientists
7324 So. Union Park Ave.
Suite 100
Midvale, Utah 84047
Telephone 801-561-1555
Fax 801-561-1861

**Subject: Adequacy of Sedimentation Pond Following
Extension of Culvert UC-3, Horizon Mine**

Dear Sharon:

I appreciated the opportunity last Friday to discuss the proposed extension of culvert UC-3 at the Horizon Mine. As you indicated, there appears to be a mistake on the top part of Plate 7-5, where one undisturbed drainage area is indicated to have an area of 0.6 acre, while another of similar size is indicated to have an area of 1.7 acres.

I checked with Mr. Tom Suçhoski of our office who performed the hydrologic calculations for the Horizon Mine. He indicated that the undisturbed drainage areas were initially estimated from a map with a scale of 1" = 1000', rather than the 1" = 200' map which appears at the top of Plate 7-5. We re-planimetered these two areas from Plate 7-5 and found that the 0.6-acre watershed actually has an area of 1.1 acres and the 1.7-acre watershed actually has an area of 1.3 acres. A revised copy of Plate 7-5 has been attached to clarify this error.

As a result, the actual undisturbed area draining to the Horizon sedimentation pond is 26.0 acres (14.9 + 1.1 + 1.3 + 8.7). The actual disturbed area, including the culvert extension, is 8.2 acres (as surveyed in the field). Hence the total area draining to the sedimentation pond is 34.2 acres.

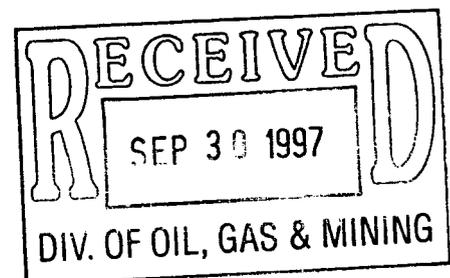
As indicated in Appendix 7-4 of the M&RP, the sedimentation pond was designed assuming a drainage area of 35.1 acres. Based on a weighted-average curve number of 70 for the combined undisturbed and disturbed areas, this resulted in a runoff volume of 0.56 acre-foot from the 10-year, 24-hour precipitation event. With the reduced area of 34.2 acres, the runoff volume would be 0.54 acre-foot. Hence, even with the additional pad created by the culvert extension, the actual runoff to the pond will be less than the design volume.

The sediment storage volume for the pond was based on a ratio of 0.1 acre-foot of sediment for every acre of disturbed area. Therefore, with a reduced disturbed area, the design storage volume for the pond could also be reduced. Hence, the pond is adequately sized to retain the runoff and sediment which would result from the culvert expansion.

Please contact me if you have any questions.

Sincerely,

Richard B. White, P.E.
President



cc: Mike Gipson (Horizon Coal Corporation)



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

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September 26, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Jess Kelley, Reclamation Specialist *JK*

RE: Extension of Culvert UC-3 and Adjacent Disturbed Area Boundary, Horizon Coal Corporation, Horizon Mine, ACT/007/020-97D, Folder #2, Carbon County, Utah

SUMMARY:

During the construction of the surface facilities at this site, the permittee discovered that the disturbed area boundary in Jewkes Creek Canyon, as shown on the approved maps, did not correspond to the approved legal description, according to which the on-the-ground markers had been placed. The permittee thus proposes, by this amendment, to correct the disturbed area boundary, as it is shown on the approved maps. This will also require the extension of the main pad and of Culvert UC-3 for approximately 100 feet upstream in Jewkes Creek.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Analysis:

Affected Area Boundary Maps

In 1997, the affected area boundary, as it was represented on the approved maps, was revised to correspond both with its approved legal description and with how it was actually

delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. The corrected affected area boundary is shown on Drawing A, which is found in Appendix 3-9.

Findings:

The plan fulfills the requirements of this section.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Analysis:

Facilities and Structures

In 1997, the affected area boundary, as it was represented on the approved maps, was revised to correspond both with its approved legal description and with how it was actually delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. As part of the same revision, both the main pad in this area and Culvert UC-3, which carries Jewkes Creek beneath the main pad, were also extended approximately 100 feet upstream to the boundary of the affected area.

The 1997 correction of the affected area boundary and the resulting extension of the main pad and of Culvert UC-3 are discussed in Appendix 3-9. The corrected affected area boundary, the main pad extension, and the culvert extension are shown on Drawing A, which is found in Appendix 3-9.

Findings:

The plan fulfills the requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Analysis:

Affected Area Maps

In 1997, the affected area boundary, as it was represented on the approved maps, was revised to correspond both with its approved legal description and with how it was actually delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. The corrected affected area boundary is shown on Drawing A, which is found in Appendix 3-9.

Mining Facilities Maps

In 1997, the affected area boundary, as it was represented on the approved maps, was revised to correspond both with its approved legal description and with how it was actually delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. As part of the same revision, both the main pad in this area and Culvert UC-3, which carries Jewkes Creek beneath the main pad, were also extended approximately 100 feet upstream to the boundary of the affected area. The corrected affected area boundary, the main pad extension, and the culvert extension are shown on Drawing A, which is found in Appendix 3-9.

Findings:

The plan fulfills the requirements of this section.

RECLAMATION PLAN

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Analysis:

Affected Area Boundary Maps

In 1997, the affected area boundary, as it was represented on the approved maps,

Page 4
ACT/007/020-97D
September 26, 1997

was revised to correspond both with its approved legal description and with how it was actually delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. The corrected affected area boundary is shown on Drawing A, which is found in Appendix 3-9.

RECOMMENDATION:

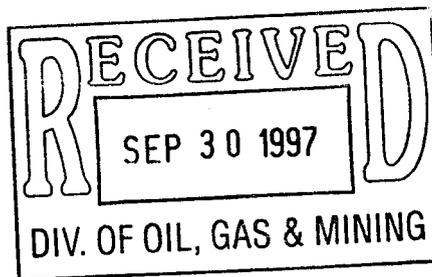
It is recommended that the permittee revise the approved maps to show the revised affected area boundary and that, thereafter, this amendment be approved and included in the approved plan.

cc: Daron Haddock
O:\007020.HZN\FINAL\CULVEXTE.97D



EarthFax

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September 30, 1997

Ms. Susan White
Utah Division of Oil, Gas & Mining
1594 West North Temple
Salt Lake City, Utah 84114-5801

ACT/007/020 #2
ACT/007/020-97D

Subject: Survey Extent of Riparian Area at the Horizon Mine

Dear Susan:

Pursuant to your request, we have enclosed six copies of a map showing the extent of the riparian area at the Horizon Mine, as surveyed in the field. This map should be placed in Appendix 9-2 of the Mining and Reclamation Plan.

Please contact Vicki Bailey of our office if you have any questions.

Sincerely,

Richard B. White, P.E.
President

cc: Mike Gipson (Horizon Coal Corporation)



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

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September 18, 1997

Vicky Bailey
EarthFax Engineering
7324 South Union Park Avenue
Midvale, Utah 84047

Re: UC-3 Culvert Extension, Horizon Coal Company, Horizon Mine, ACT/007/020-97D,
Folder #2, Carbon County, Utah

Dear Ms. Bailey:

We have received the above-referenced amendment. The amendment involves extending the main mine bypass culvert approximately 100 feet along Jewkes Creek. The proposed project takes place entirely within the current approved disturbed area of the mine.

Our agency anticipates reviewing this amendment by October 3, 1997. A copy is available for review at our Salt Lake and Price offices.

If you have any questions please call.

Sincerely,

A handwritten signature in black ink that reads "Daron R. Haddock".

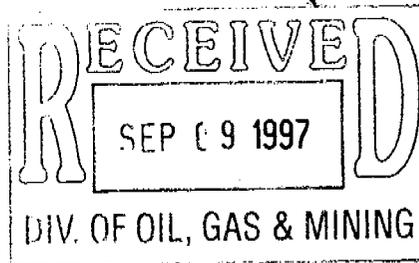
Daron R. Haddock
Permit Supervisor

tt

cc: Ranvir Singh, OSM
Mark Page, Water Rights
Dave Ariotti, DEQ
Bill Bates, DWR
Price Field Office

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September 8, 1997



Mr. Bob Davidson
Utah Division of Oil, Gas and Mining
1594 West North Temple
Suite 1210
Salt Lake City, UT 84114

ACT/007/020 #2

Bob

97-D

Susan

EarthFax
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Telephone 801-561-1555
Fax 801-561-1861

Dear Bob,

Laboratory Data for soil samples TP-4, 5, 42, 43, and 44 have been submitted to the Carbon County Extension Service for evaluation to determine fertilizer requirements to be added to the soil during seeding in 1997. The area will be fertilized as required and mulched (Section 3.5.5.3). Seeding will then commence using a combination of the UDOGM approved seed mixes, transplants and containerized stock available for the 1997 planting season. Erosion control matting will be used where the slope grades are 2 1/2H:1V or steeper.

Due to the change in ownership and permitting concerns the seed and seedlings were not ordered in advance. The previous owners had a different plan for the surface disturbance and were not planning on seeding the area this year. Horizon recognizes the need to accomplish the seeding, but will have to utilize what approved seed is available. I have had conversations with the state nursery concerning seedlings and with several seed companies concerning seed. A listing of the seeds and seedlings will be submitted to UDOGM once we determine what materials are available.

The areas to be seeded in 1997 will include those outlined on the attached map. Topsoil/growth medium has been placed on these areas from soils salvaged during site construction. Hidden Splendor Resources has placed topsoil/growth medium on areas of their property from the soils salvaged from the realignment of the county road in Jewkes Canyon. The lands within the disturbed area are leased from Hidden Splendor Resources. Hidden Splendor authorized a contractor to place topsoil on areas both inside and outside the disturbed area to cover pre-existing damage done by mining.

The topsoil/growth medium was placed in depths ranging from 10 - 12 inches.

Should you require any additional information please contact me at (801) 561-1555.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Vicky".

Vicky S. Bailey

cc: Daron Haddock
Bill Malensick
Mike Gipson



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

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801-538-7223 (TDD)

September 26, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Jess Kelley, Reclamation Specialist *JK*

RE: Extension of Culvert UC-3 and Adjacent Disturbed Area Boundary, Horizon Coal Corporation, Horizon Mine, ACT/007/020-97D, Folder #2, Carbon County, Utah

SUMMARY:

During the construction of the surface facilities at this site, the permittee discovered that the disturbed area boundary in Jewkes Creek Canyon, as shown on the approved maps, did not correspond to the approved legal description, according to which the on-the-ground markers had been placed. The permittee thus proposes, by this amendment, to correct the disturbed area boundary, as it is shown on the approved maps. This will also require the extension of the main pad and of Culvert UC-3 for approximately 100 feet upstream in Jewkes Creek.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Analysis:

Affected Area Boundary Maps

In 1997, the affected area boundary, as it was represented on the approved maps, was revised to correspond both with its approved legal description and with how it was actually

delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. The corrected affected area boundary is shown on Drawing A, which is found in Appendix 3-9.

Findings:

The plan fulfills the requirements of this section.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Analysis:

Facilities and Structures

In 1997, the affected area boundary, as it was represented on the approved maps, was revised to correspond both with its approved legal description and with how it was actually delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. As part of the same revision, both the main pad in this area and Culvert UC-3, which carries Jewkes Creek beneath the main pad, were also extended approximately 100 feet upstream to the boundary of the affected area.

The 1997 correction of the affected area boundary and the resulting extension of the main pad and of Culvert UC-3 are discussed in Appendix 3-9. The corrected affected area boundary, the main pad extension, and the culvert extension are shown on Drawing A, which is found in Appendix 3-9.

Findings:

The plan fulfills the requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Analysis:

Affected Area Maps

In 1997, the affected area boundary, as it was represented on the approved maps, was revised to correspond both with its approved legal description and with how it was actually delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. The corrected affected area boundary is shown on Drawing A, which is found in Appendix 3-9.

Mining Facilities Maps

In 1997, the affected area boundary, as it was represented on the approved maps, was revised to correspond both with its approved legal description and with how it was actually delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. As part of the same revision, both the main pad in this area and Culvert UC-3, which carries Jewkes Creek beneath the main pad, were also extended approximately 100 feet upstream to the boundary of the affected area. The corrected affected area boundary, the main pad extension, and the culvert extension are shown on Drawing A, which is found in Appendix 3-9.

Findings:

The plan fulfills the requirements of this section.

RECLAMATION PLAN

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Analysis:

Affected Area Boundary Maps

In 1997, the affected area boundary, as it was represented on the approved maps,

Page 4
ACT/007/020-97D
September 26, 1997

was revised to correspond both with its approved legal description and with how it was actually delineated by markers on the ground, which were identical the one with the other. This revision resulted in the extension of the affected area boundary, on the approved maps only, for approximately 100 feet up Jewkes Creek. The corrected affected area boundary is shown on Drawing A, which is found in Appendix 3-9.

RECOMMENDATION:

It is recommended that the permittee revise the approved maps to show the revised affected area boundary and that, thereafter, this amendment be approved and included in the approved plan.

cc: Daron Haddock
O:\007020.HZNF\FINAL\CULVEXTE.97D