

TRACKING FORM

I. KEY FEATURES OF PERMITTEE'S AMENDMENT APPLICATION

Permittee Horizon Coal Company	Mine Name Horizon	Amendment # ACT 10071020-97A	Date Received / By 2-10-97 Vicky Bailey <i>hand discovered</i>
Proposal: D.O. 96A--Violation 96-35-1-2, Update Information			
Description: commitments contained within the permit document. Areas having to do with UDOGM enforcement jurisdiction & the responsibilities of various government agencies to enforce the commitments described in the permit			

II. AMENDMENT CLASSIFICATION

<input checked="" type="checkbox"/> Major Amendment	Public Notice Required	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Minor Amendment	Outside of Permit Area	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
	Outside of Disturbed Area	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

III. SUMMARY OF DOGM PROCESSING DATES

Reviews Completed	2/11/AM	FOLLOWUP REQUIREMENTS	
Approved Effective		MRP "After Const" Documents	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Disapproved		TA	<input type="checkbox"/> Yes <input type="checkbox"/> No
Mailed		CHIA	<input type="checkbox"/> Yes <input type="checkbox"/> No
Filed MRP - SLO		Responds Within 15 days of Receipt?	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, explain below.

IV. COORDINATED REVIEWS

4/17 - Second Round COMBINED W STAPS DUE 7/1

EXTERNAL AGENCIES (Mine Specific) <small>(Adverse Comments, if Any, include in Item VI)</small>			DOGM REVIEWS/DISCIPLINES		
	COPY SENT	CONTACTED			
OSM	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	Generalists	<i>WML</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A
BLM	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	INTERDISCIPLINARY APPROACH		
US Forest Service	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Administrative	<i>3/31</i>	<input type="checkbox"/> Yes <input type="checkbox"/> N/A
US Fish & Wildlife	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Biology	<i>SUSAN</i>	<input type="checkbox"/> Yes <input type="checkbox"/> N/A
US National Parks	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Engineering	<i>JESSE</i>	<input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT Environmental Quality	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Geology		<input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT Wildlife Resources	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Hydrology	<i>SHARON</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A
UT State History	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Soils	<i>BOB DUNN</i>	<input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT Water Rights	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Permitting		<input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT SITLA	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Other		<input type="checkbox"/> Yes <input type="checkbox"/> N/A
Other	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A			<input type="checkbox"/> Yes <input type="checkbox"/> N/A

V. FOOTNOTES/ADDITIONAL EXPLANATION AS NECESSARY

This timely submission was delivered to the Price Field Office on 2/10/97. The SHC staff has been working with Earth Fax on individual issues; therefore, did not look into these items.

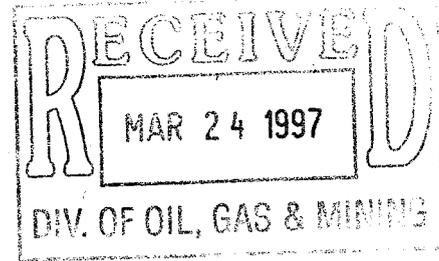
Have retained one copy at the PFO for other agency review. *response to 4/24 letter due 6/16*



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Michael O. Leavitt
Governor
Ted Stewart
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801-538-4709 (Fax)



March 19, 1997

Mr. James W. Carter, Director
Utah Division of Oil, Gas and Mining
1594 West North Temple, Ste. 1210
Salt Lake City, Utah 84116-3154

ATTENTION: Joseph C. Helfrich
Bill Malencik

SUBJECT: Horizon Coal Mine permit amendment. Horizon Coal Company, Horizon Mine,
Carbon County, Utah

Dear Mr. Carter:

*ACT 1007/1020 #2
Copy Joe, Bill M., Susan*

The Utah Division of Wildlife Resources has reviewed the above mentioned mine permit amendments. We have the following comment.

The permit needs to stipulate that the power line support towers are to be raptor proof. The raptor proofing needs to follow the guidelines outlined in *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*, Edison Electric Institute, Washington, D.C.

We appreciate the opportunity to review this permit renewal and provide our comments. If you have any questions, please call Ben Morris or Bill Bates at (801) 637-3310.

Sincerely,

John Kimball
Director

cc: Reed Harris, USFWS

horizon.001





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

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801-359-3940 (Fax)

801-538-7223 (TDD)

July 11, 1997

Brad Bourquin, P.E.
1131 South Dover St.
Denver, Colorado 80232

Re: Response to Division Order 96A and Permit Stipulations, Horizon Coal Company,
Horizon Mine, ACT/007/020-97A & 97C, Folder #2, Carbon County, Utah

Dear Mr Bourquin:

The referenced amendments 97A & 97C are hereby approved effective July 11, 1997. A stamped approved incorporated copies is enclosed for insertion into your Mining and Reclamation Plan.

If you have any questions please call.

Sincerely,

Joseph C. Helfrich
Permit Supervisor

tt

Enclosure

cc: Ranvir Singh, OSM
Richard Manus, BLM
Alan Rabinoff, BLM, w/o
Mark Page, Water Rights, w/o
Dave Ariotti, Health, w/o
Bill Bates, DWR, w/o
Bill Malencik, DOGM

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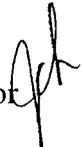
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March 24, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor 

FROM: Susan White, Senior Reclamation Biologist 

RE: Review of February 10, 1997 Submittal, Horizon Coal Corporation, Horizon Mine, ACT/007/020-97A, Folder #2, Carbon County, Utah

SUMMARY:

Permit revisions were received by the Division on February 10, 1997. The Condition to Permit Approval **R645-301-353** was not completed. A **hindrance violation** should be issued. Several other minor changes were made to the permit and have resulted in deficiencies. Sweets Pond and associated utilities have not been shown as within the permit area, therefore, no review of the pond in relation to Land Use was made. The amendment should not be approved.

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.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

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

Analysis:

The proposed Horizon Mine site is the former site of the Consumers or Blue Blaze Mine. The Consumers Mine was developed in the 1920's. The community of Consumers

had a four-story apartment house, a store service station and a post office. The Consumers Mine closed in 1938 and was again opened at a later date. By 1952, all of the Gordon Creek mines had shut down. Numerous features still remain from the old mine as described in Appendix 5-1, pages 27 to 34. Most of these features will be removed during the construction of the Horizon Mine.

In 1985, Desert West Research designated the Consumers site 42Cb517 and listed it as a potential nominee to the National Historic Register. Since that time significant impacts have occurred to the site. The Permittees consultant, Baseline Data, Inc., concludes in its report (Appendix 5-1, page 37), that Title IV activities at the site have adversely impacted or removed major site features and have thus changed that determination of eligibility for nomination to the National Historic Register. Since other records such as maps, photos, and agency records provide information on the site, no mitigation should be required. In an October 24, 1995 letter to the Division and in a December 5, 1995 telephone conversation with Division representatives, State Historic Preservation Officer James Dykmann concurs with this determination that the proposed work will have no impact on historic properties.

Findings:

Information provided in Chapter 5 of the plan meets the requirements of this section.

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/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).

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)

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.

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 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 requirements of this section.

FISH AND WILDLIFE RESOURCE INFORMATION

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

Analysis:

Two major aquatic habitats occur within the Horizon Mine permit area (page 10-7), North Fork Gordon Creek and Beaver Creek. The Division of Wildlife Resources (DWR) states in a letter dated October 31, 1995 that Gordon Creek supports a population of Cutthroat trout and they plan to create a sport fishery. Beaver Creek is ranked by DWR as being of substantial value as a salmonid fishery. The greatest value of both Gordon Creek and Beaver Creek aquatic habitats is the water, cover, food and breeding sites they provide to a variety of terrestrial vertebrates (pages 10-8 and 10-15).

Jewkes Creek, an intermittent stream thru the lower portion of the disturbed area, is currently limited in its ability to support a fisheries due to erosion, siltation, cover and low flow during most of the year. Fish have not been seen or reported in Jewkes Creek.

Aquatic surveys were conducted in 1980 and 1981 (page 10-4, pages 10-20 thru 10-24, and Appendix 10-2) in Beaver Creek and North Fork Gordon Creek. These surveys are of some value as baseline data in Beaver Creek, although dated. The study conducted on the North Fork Gordon Creek is of limited value, because the study was designed and sites selected for a study which was done for the Gordon Creek 2, 7, and 8 Mines. The permittee has committed to a macroinvertebrate and fish study in the late Summer or early Fall of 1996 and 2001 (page 10-4). DWR has just recently (September 1996) requested that fish sampling be delayed until Spring 1997. They felt that the very low water levels along with the electrical shocking of the fish could cause undo stress on the fish. They also stated that the sampling would not be representative of the normal distribution of fish. Sampling locations for the studies will be upstream and downstream from the site in Gordon Creek. Currently, the North Fork of Gordon Creek has been impacted from the logging activities resulting in heavy sediment deposition in Gordon Creek.

The entire permit area is classified as critical elk summer range and critical deer summer range (Plate 10-1). The permit area is located just northwest of the DWR Gordon Creek Wildlife Management Area (WMA) which is approximately 22,000 acres and managed for big game winter range.

In June 1989, DWR conducted a raptor inventory of the permit area. One active Golden eagle nest with two young, and three inactive Golden eagle nests were found (page 10-14, Appendix 10-1). A 1995 study was conducted in the area and the nests were found to be inactive. A commitment is made to survey the trees for nests before removal for surface facilities (page 10-38). The DWR states in a letter dated October 31, 1995 that no Bald

eagle nests have been found in the area, but courtship activity has been observed at the winter roost on the Gordon Creek Wildlife Management Area. The letter continues to include that Bald eagles are likely to use the permit area (page 10-34). Golden eagles and red-tail hawks are found and Sharpshinned hawks and goshawks may use the area.

No threatened or endangered species were found on, or near, the permit area (page 9-10). Federal plant species are listed in Table 9-6.

In 1981, the U.S. Fish and Wildlife Services (USFWS) inspected the site. The biologist concluded that although power lines were considered unsafe, hazard was slight due to positioning.

A letter to DWR from Mr. Skaggs, dated April 30, 1992 (Appendix 7), states that no bats had been observed inhabiting the old mine workings. Additionally, on June 14, 1996 a bat survey performed by a qualified biologist, Brad Lengas, concluded that the old mine portals were not being used as a summer bat roost (Appendix 10-1). Mr. Lengas could not determine during the survey whether the portals had been used as winter roost (hebernaculum). If portal development occurs during the winter hibernation period an additional survey may be required prior to disturbance.

Findings:

The plan meets the requirements of this section.

LAND-USE RESOURCE INFORMATION

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

Analysis:

The canyon in which the Horizon Mine is proposed to be built has been used for coal mining since the early 1900's and apparently abandoned in 1953. Other than coal mining, the area has been used for wildlife habitat, limited sheep grazing and recreation (page 4-7). Carbon County has zoned the proposed Horizon Mine site area as M & G 1 (page 4-7 and Plate 4-1). M & G 1 is a mining and grazing zone.

The permit area has been extensively mined previously (Plates 4-1 and page 4-7). Room and pillar methods of mining were commonly used in both the Hiawatha seam and the

Castlegate 'A' seam. Prior to coal mining (late 1800's), the area was used primarily for ranching with limited timber operations.

No public park or cemetery is located within or adjacent to the permit area. Carbon County owns and maintains two roads which run parallel to and through the disturbed area. The roads are currently (1995) being used extensively by logging trucks with county maintenance.

Findings:

Information regarding land use classification meets the minimum regulatory requirements of this section.

OPERATION PLAN

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

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

Analysis:

No public parks, and no cultural or historical places or cemeteries which might be listed or eligible for listing in the National Register of Historic Places, are found within the permit area. This finding was made by State Historical Preservation Officer Jim Dykman in an October 24, 1995 letter to the Division.

Findings:

The information provided meets the regulatory requirements of this section.

FISH AND WILDLIFE INFORMATION

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

Analysis:

Protection and Enhancement Plan.

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 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. The type of fencing will exclude sheep and be as specified by DWR. DWR has requested the fencing of a riparian zone in Spring Two Canyon; and details will be discussed with the Operator and the Division.

Endangered and Threatened Species.

Fish and wildlife species which are listed endangered, threatened and of special interest are listed on pages 10-25 thru 10-33. The permit states that only the American Peregrine falcon and the Bald eagle would likely be present in the area (page 10-24), but not within the permit area. The DWR states that bald eagles are likely to use the permit area. They also state that while no Bald eagle nests have been found in the Gordon Creek area courtship activity has been observed at the winter roost.

Bald and Golden Eagles.

Bald and Golden eagles are likely to use the permit area. A Golden eagle/Prairie falcon nest is shown on map in Appendix 10-1. Apparently the area is used by both the Golden eagle and the Prairie falcon but never at the same time. The nesting territory identified is currently outside of the permit area and within several hundred feet of the permit

area. The current mining plan should have no effect. Since these nests have been inactive for years it may be possible that a permit could be obtained from the U.S. Fish and Wildlife service for a take permit when mining is anticipated to impact the area. A commitment is made (page 10-15) to contact the regulatory authorities should the nest become active and threatened by mining.

A raptor hazard survey was conducted in the area, which document hazardous power lines (page 10-36). The permit concludes that potential electrocutions are slight because of nonuse. The commitment is made, on page 10-35, to construct all power lines within the permit area to minimize electrocution hazards to raptors. UDWR has requested that all power lines follow the raptor proofing guidelines outlined in *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*, Edison Electric Institute, Washington, D.C.

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

A wetland riparian zone was created in the area of confluence of Portal Canyon and Jewkes Creek. The wetland was probably created during the early mining of the Consumers Mine in the 1920's. The quality of this wetland/riparian area could be classified as degraded. The county has done road realignment work within the wetland. The area has been used for years, since original mining, as an unloading and camping area for recreationists, hunters and herders. During Spring 1996 the area was heavily deposited with sediments from the logging operations upstream. Nevertheless, the wetland is a high value area filtering sediments prior to entering the North Fork of Gordon Creek and providing food, water and shelter for numerous wildlife species.

The permit area is within an area classified by DWR as critical summer elk and deer habitat. The permit area is within one mile of the Gordon Creek State Wildlife Management Unit. The general area has also been ranked as being of substantial value to wintering Bald eagles. Bald eagles are likely to be seen in the area; however, to date, none have been observed roosting within the proposed disturbed area.

Findings:

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

R645-301-333.300, a commitment must be made to construct all power line towers according to the guidelines outlined in *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*, Edison Electric Institute, Washington, D.C.

VEGETATION

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

Analysis:

The Permittee has committed to interim revegetation of areas disturbed to develop the mine, but not used for the mining operation (page 3-32). On these sites, a temporary seed mixture will be used for interim stabilization (page 3-34). The seed mixture, mostly grasses, was designed primarily for quick establishment.

Findings:

Information found in the plan was found to meet the minimum requirements of this section.

RECLAMATION PLAN

POSTMINING LAND USES

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

Analysis:

Once mining has ceased, the disturbed areas will be reclaimed to its principal pre-mining use: undeveloped land. The general region in the area of the mine site is classified as critical deer and elk summer habitat, although most of the habitat is limited to the higher elevations within the permit area (page 4-8). Site inspection verifies that the proposed disturbed area shows low to moderate big game use. The seed mixture is designed for wildlife food value and the planting should provide for wildlife cover.

The area of proposed disturbance has been previously mined and disturbed to degrees

varying from slight to severe. Areas of slight disturbance have soils which have been somewhat impacted but have remained in place and support vegetation. These soils will be salvaged for use in areas which had been severely disturbed and support none to only weedy plant growth. Thus, the area should be able to support the intended postmining land use.

Surface owner comments concerning the proposed postmining land use are in Appendix 4-1. The letter from Cecil Walker, Hidden Splendor Resources, LTD, states that they accept the reclamation plans and postmining land use proposed by Horizon Coal Corporation in the mine permit application.

Findings:

Information found in the plan was found to meet the minimum requirements of this section.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

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

Analysis:

Wildlife habitat with limited livestock grazing is not proposed as the primary postmining land use in the reclaimed disturbed area. However, this use is likely to be a secondary use. Wildlife enhancement measures during reclamation include using a seed mixture which contains a diverse mixture of grass, forbs, and shrubs which are known to be palatable to wildlife. Container stock (page 3-37) will also be planted to provide cover for the wildlife. Rock piles will be created (page 3-38) for wildlife habitat enhancement. Approximately 1100 Salix cuttings as well as Snowberry and Water Birch (page 3-39) will be planted along the riparian areas after reclamation to stabilize the drainage and start restoration of the riparian habitat.

Findings:

Information found in the plan was found to meet the minimum requirements of this section.

CONTEMPORANEOUS RECLAMATION

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

Analysis:

The Permittee commits to contemporaneous reclamation (Section 3.5.1). When disturbed areas are no longer needed they will be backfilled, graded, retopsoiled, and revegetated. However the permit change suggest that the temporary seed mixture will be used. Contemporaneous revegetation is permanent revegetation performed during the operations phase of mining on land that will not be disturbed again. Interim revegetation is only temporary revegetation and stabilization on lands which will be disturbed during operation or reclamation activities. Because the site is so small all available space will be used and it is likely that no reclamation will occur until the mine closes.

Findings:

The Permittee is not in compliance with this section. Prior to approval. The permittee must provide the following in accordance with:

R645-301-352. Temporary seed mixture must be changed to permanent seed mixture when referring to contemporaneous revegetation.

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:

General Requirements

A reclamation schedule has been illustrated in Table 3-4. The shading on the table is not discernable and a darker copies must be submitted for inclusion in the plan. The schedule details each major step in the revegetation plan as required in R645-301-341.100. The schedule illustrates seed, plant and other material ordering with adequate lead times for procurement.

All seeds to be planted on site will comply with all state and federal seed laws (page 3-32).

The seed mixture to be used for permanent seeding is designated on page Table 3-3. The seed mixture is comprised of species native to the area and desirable for wildlife use, in particular big game use. The seed mixture includes the Gordon Creek variety of Wyoming big sagebrush which is preferred if available. A separate seed mixture has been designated for the .43 acres of wetlands to be recreated along Jewkes Creek.

The seed will be broadcast seeded (page 3-42) and then raked to ensure proper seed to soil contact. A commitment has been made in the plan to leave the site in a roughened state. This roughened state has proven to be very important to the success of the reclamation project.

Timing

The plan commits to a fall planting (page 3-33). This is the normally accepted time of year to be seeding in the region. The plan provides for a contingency if seeding is not completed by November 30, then a quick growing ground cover, such as Regreen will be planted until the next growing season.

Mulching and Other Soil Stabilizing Practices

Two thousand pounds per acre straw mulch will be applied over the seeded areas and then incorporated while the surface is being roughened before seeding (page 3-33). The permit states that at the time of reclamation the most beneficial type of mulch to be used will be determined by the Division and Permittee. The Division's experience in the area has been to place 2 tons per acre alfalfa on the soil surface and incorporate this while the surface is being roughened and then seed broadcasted. This commitment is acceptable to the Division. All slopes 2.5h:1v or steeper will have erosion control matting installed. The matting will provide the additional protection needed on these steeper slopes.

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 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 characteristics to be considered successful. The reclaimed channel for Jewkes Creek shown in Figure 7-12 provides for a 12 foot wide 100 year flood plain. In places the wet meadow/riparian area is 50 feet wide and will likely never meet the bond release standards for this area. Therefore, the Jewkes Creek channel will have to be redesigned in order to have a reasonable chance of meeting this standard prior to permit approval.

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:

Information found in the plan does not meet the minimum regulatory requirements of this section. The Permittee must provide the following, prior to approval, in accordance with the requirements of:

R645-301-121.200. Table 3-4 must be resubmitted in a legible form.

R645-301-353. The Permittee must present a reclaimed drainage through the Jewkes Creek area which will allow a reasonable likelihood of reestablishing the riparian/wet meadow vegetation which currently exist on site. At minimum the riparian/wet meadow community must be of the extent as shown on the wetlands map in Appendix 9-2.

STABILIZATION OF SURFACE AREAS

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

Analysis:

All final grading and placement of topsoil will be done along the contour to minimize erosion and instability. The Permittee has committed to fill, regrade, seed and otherwise stabilize any rills or gullies which develop (page 3-31). The commitment is also made to plant a soil stabilizing cover crop such as Regreen if erosion work is done during that portion of the year in which final seeding is not optimal.

Findings:

The information provided meets the regulatory requirements of this section.

RECOMMENDATION

Prior to approval, the requirements of R645-301-121.200, R645-301-333.300, R645-301-353, and R645-301-352 must be provided as discussed above. Since R645-301-353 was a condition of permit approval which was not addressed in a timely manner a hindrance violation should be issued.



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

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July 2, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Sharon Falvey, Senior Reclamation Specialist *SF*

RE: Stipulation Response #2, Horizon Coal Company, Horizon Mine, PRO/007/020-97A and 97C, Folder #2, Carbon County, Utah.

SYNOPSIS

The amendment, submitted on June 16, 1997, is filed under amendment numbers 97A and 97C. Amendment 97A, was submitted to respond to stipulations associated with the February 8, 1997 submittal. Amendment 97C, is the response to a public objection filed against the proposed permit transfer. This review addresses sections for which hydrologic and related information is presented. Corrections include those changes associated with the TA completed for the February 8, 1997 submittal. When updating the TA, all appropriate sections in the TA should be replaced. The following paragraphs summarize some important points covered in this TA.

In response to the public objection filed against the proposed permit transfer, the permittee has indicated the pipeline and Sweets Pond would not be used with the leased water rights. Horizon has committed to reclaim the land where the pipeline lies according to requirements of the land owner. The reclamation stated to be required by the county is to simply disconnect and plug the line (section 3.5.3.2). Horizon is in the process of determining which of these sources will be utilized and will document the source once all rights, permits and permissions have been collected.

The information contained in Appendix 3-5 should be removed from the existing plan. An assignment of the right to use Sweet's Canyon Pond and lease one acre-foot of water for evaporation losses are presented under Water User's Claim # 91-750, in Appendix 3-5. Because Sweets Pond will not be used the 1 acre foot (AF) evaporation associated with the pond probably no longer applies. The dam application included in the appendix should also be removed.

In response to the technical deficiencies the permittee has provided an acceptable reclamation channel design. The reclamation sedimentation control measure include use of alternate sediment control measures rather than a siltation structure. The requirements of R645-301-763 state "Siltation structures will be maintained until removal is authorized by the Division and the disturbed

area is stabilized and revegetated". BTCA measures have been granted by the Division in the past, in leu of a sedimentation pond for ephemeral systems, however, this is a perennial/intermittent system and has a higher risk of contributing excess sediment off-site.

The plan provides measures for alternate sediment control. Some of the sequencing in implementing these measures is not clear but, it is often difficult to determine these details in advance of reclamation. On site and pre- construction meetings with the Division and the operator can clarify these issues. The approval of these measures should be re-assessed at the time of reclamation to assure the methods are considered BTCA at the time of reclamation. It is believed that these additional measures will allow the applicant to provide BTCA and meet reclamation success as it was intended under the SMCRA.

ANALYSIS

CLIMATOLOGICAL RESOURCE INFORMATION

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

Analysis:

Climate is discussed in the following areas within the MRP; in Chapter 11, in Chapter 9, in the Soils Section, in the Biology Section, and in the Cultural and Paleontologic Resources Study Addendum (Appendix 5-1).

Presented climate information was obtained from three data collection sites in the surrounding area: the Skyline Mine (1993 data); the town of Price; and the town of Hiawatha. Climate variation at these sites are influenced by elevation and aspect. The Skyline Mine lies in a high mountain canyon at an elevation of 8,710 feet; the town of Price lies in a river valley at an elevation of 5,700 feet; while the town of Hiawatha lies at an elevation of 7,200 feet. The proposed mine site is in a canyon at an elevation of approximately 7,600 feet. Climatic information, therefore, comes from sites which are slightly different from that of the proposed mine site.

In chapter 11, the respective average annual temperatures are presented, for the Skyline Mine and for Price, as 37.7°F and 62.1°F. The respective average annual precipitation at Skyline is presented as 27.37 inches and, at Price as 10.94 inches. At the Skyline Mine, the coldest month of 1993 was January, with an average temperature of -9°F, while the warmest month was August, with an average temperature of 80°F.

Within the soils section, the average annual temperatures at the mine site were

stated to range from 36°F to 45°F and the cumulative annual precipitation ranged from 12 inches to 30 inches. In the Biology sections the range of cumulative annual precipitation is presented as 16 inches to 20 inches.

The Cultural and Paleontologic Resources Study Addendum describes the prevailing climate using data from records compiled at Hiawatha, Utah. Hiawatha was used because its location on the east edge of the Wasatch Plateau is similar to that of the proposed mine site. Hiawatha has a mean annual temperature of 45.5°F and a mean annual precipitation of 14.5 inches for the period of record reported by the U.S. Department of Commerce in 1973. The town receives its highest precipitation, 2 inches on average, in August.

The plan contains no site-specific climatological data but, an approximate range of data can be determined from the information scattered throughout the plan. The Division finds that this information meets the minimum regulatory requirements. The Division recommends, however, that the Permittee set up a weather station at the site so that precipitation events can be correlated with other monitoring data.

Findings:

The information in the plan meets the minimum regulatory requirements for this section.

ALLUVIAL VALLEY FLOORS

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

Analysis:

The Permittee provides a discussion on Alluvial Valley Floors (AVF's) in Section 7.4. In Appendix 7-6, a June 13, 1980 memo from the Soil Conservation Service State Soil Scientist, T. B. Hutchings addresses AVF's. According to the memo no AVF's, as defined in the Permanent Regulatory Program Office of Surface Mining Department of Interior, exist in Section 17, T13S R8E SLBM. This location is specific to the proposed disturbed area and does not mention the adjacent areas. The following paragraphs discuss the potential for AVF's in the permit and adjacent areas.

According to the reconnaissance map completed by the Office of Surface Mining, dated June 1985, Gordon Creek, downstream of the mine site, is a "Potential" Alluvial Valley Floor. Mining is not expected to materially damage the water supply of these potential alluvial

valley floors because the mine site is contained in a relatively small contributing section of the watershed.

Information on Plate 6-1 indicates alluvial deposits exist in the permit and adjacent areas along Beaver Creek, the North Fork of Gordon Creek, Jewkes Creek, and continue for short distances into the tributaries above the drainages. Alluvial deposits identified at the mouth of Jewkes Creek and along the North Fork of Gordon Creek are below the coal outcrop and, therefore could not be directly impacted by mine subsidence. Soils in the valley exhibit localized signs of being flooded or water logged.

According to the plan, agricultural developments are not found along the North Fork of Gordon Creek or along Beaver Creek and their tributaries. The agricultural value in these areas is limited by the soil capability and short growing season. If these areas would be developed for agriculture, development would be restricted to grasses and pasture, however, because of the high elevation, short growing season and narrow valleys the development of meadow or pasture is not practical. Grazing utilization on undeveloped rangelands in the permit area can be found on Plate 4-1 - Land Use map.

Based on the information presented in the plan, the Division makes the following findings, in accordance with R645-302-321.310:

- 1) Unconsolidated stream-laid deposits holding stream channels are found in the area of the proposed mine site.
- 2) There is sufficient water to support agricultural activities, as evidenced by subirrigation of the lands in question.
- 3) The undeveloped rangelands found in the permit and adjacent area on alluvial materials are not significant to farming and therefore are exempt to prohibition of mining according to the Alluvial Valley Floor Identification and Study Guidelines provided by the U. S. Department of the Interior Office of Surface Mining Reclamation and Enforcement, 1983.

Findings:

The plan meets the minimum regulatory requirements for this section.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

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

Surface Water Resource Maps.

Surface water drainages can be found on surface maps. The names of important perennial and intermittent drainages were included for surface waters in the permit and adjacent area.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-720.

Analysis:

Sampling and Analysis.

The permittee is required to perform all sampling and analysis in a manner that meets the requirements of R645-301-723. Sampling times, dates and methods are not available for some baseline samples collected; however, recent data include sample date, time, and method of analysis beginning in December 1993. The 1996 metal samples were not analyzed according to the guidelines. The samples were analyzed as total metals rather than dissolved. This occurred because sedimentation in the water made filtering difficult. The samples were not filtered but, were preserved with an acid solution, thus it was necessary to analyze the parameters as total. In the future, samples should not be preserved until they are filtered. They should be filtered immediately upon delivery to the lab or at a maximum of 2 days after obtaining the sample.

Baseline Information.

Water Rights and Points of Diversion

The permittee has provided information on water rights including use description and period of use in appendix 3-5. The point of diversion for water rights near the mine operations are presented on plate 7-3. The plan states that water from the area is almost exclusively used for stock watering (section 7.1.4). Although this is true for the permit area, the

adjacent area's downstream uses include irrigation and wildlife uses. The predicted volumes for waters used in mining are within the total allocated by the water rights presented. (See the discussions under "**Probable Hydrologic Consequences Determination**" in this TA).

Although the application for change-in-point of diversion for leased water rights was approved on November 20, 1996, there was an objection to the permit transfer over the lease contract for use of the land, at the point of diversion, on which Sweets Pond is located. This situation resulted in the permittee indicating the pipeline and Sweets Pond would not be used. Because Sweets Pond will not be used the 1 acre foot (AF) evaporation associated with the pond probably no-longer applies. The permittee will need to apply for a change in the point of diversion for the leased water rights prior to use of the right associated with this point of diversion.

Utilities used to provide the water to the mine include; water trucked from an outside source to the site or, water to be pumped from the North Fork of Gordon Creek. Horizon is in the process of determining which of these sources will be utilized and will document the source once all rights, permits and permissions have been collected.

Horizon does not intend to utilize the pipeline from Sweet's Pond to the Horizon permit boundary currently. Horizon has committed to obtain approval prior to using the pipeline and will reclaim the land according to requirements of the land owner. The reclamation stated to be required by the county is to simply disconnect and plug the line (section 3.5.3.2).

Non-culinary water will be stored in a tank/pond within the disturbed area. The location for either structure was not provided in this amendment.

The permittee obtained the rights to use water in the area. The following documentation associated with the use of these rights are presented in the plan:

1. A copy of a five year water right lease agreement, dated May 1, 1995. The agreement between Horizon and Florence A. Sweet includes water rights 91-94, 91-353 and, 91-330. The water rights exchanged in the agreement with Florence A. Sweet are associated with two unnamed springs and an underground water tunnel.
2. Copies of approvals for the water right change applications.
3. An assignment of the right to use Sweet's Canyon Pond and lease one acre-foot of water for evaporation losses are presented under Water User's Claim # 91-750, in Appendix 3-5.

4. A dam application is included and describes the pond use as a Water Truck Fill / Private Fish Pond. The private fish pond is proposed for a postmining land use in the agreement. Sweets Pond will be used to collect and convey water associated with the spring water rights used for domestic and industrial consumption at the Horizon Mine.

The information contained in Appendix 3-5 and described as items 3 and 5 above should be removed from the existing plan.

The approvals received from the Division of Water Rights for the water rights, 91-353, 91-94, and 91-330 followed a protest from some downstream water users. Changes in use for the water rights were approved with conditions. The conditions for rights 91-353 and, 91-94 are summarized below:

1. Redevelop spring box at same elevation as the existing one.
2. Install a flow measuring device and provide records of the water diverted.
3. The season of use will remain the same.

The permittee has received the right to change the location of use. Based on the following information: 1) The water previously used in the Sweets Mine was determined to come from the same waters. 2) The sump will be located 1000 feet down gradient of the Sweets Mine. 3) The total amount of water estimated to be consumed by the mine were presented as 9.1 acre feet consumed in-mine and, 6.8 acre-feet used in surface operations or, a total of 15.9 acre-feet of water per year. 4) The mining should not affect the use of water rights by the protestants.

The conditions for water right 91-330 is summarized below:

1. A flow measuring device is to be installed to account for the water used by Horizon under the water right and diversion records will be provided.

Table 1
Water Rights to be Used in Mining

Water Right #	Season of Use	Quantity of Use (cfs)	Potential total for season of use (AF)
91-94	5/1 to 9/1	0.1500	72.00
91-353	5/1 to 9/1	0.0150	3.66

Water Right #	Season of Use	Quantity of Use (cfs)	Potential total for season of use (AF)
91-330	1/1 to 12/31	0.5570	2565.00
91-750	1/1 to 12/31	± AF evaporation	± AF

General Baseline Water Quality

During early baseline data acquisition the permittee collected data according to the 1986 water quality monitoring guideline. The Division has a new guideline effective April 1995. The major difference between the data collected through 1996 and the data required by the new guidelines is the acquisition of certain dissolved constituents, total alkalinity, and phosphate as orthophosphate. Although previously collected data will provide useful information, new data will be collected according to the new guidelines. The proposed operational and reclamation phase surface water monitoring parameters and groundwater monitoring parameters are provided, in Table 7-5 and Table 7-2 respectively. Baseline groundwater monitoring are described in the plan under Section 7.1.5, and the baseline surface water monitoring is described in Section 7.2.2.3. Baseline parameters will be collected every fifth year, prior to permit renewal, at low flow for the operational monitoring sites.

Groundwater Information.

Section 6.4.1 describes site stratigraphy and provides information relative to groundwater in relation to the mine operations, while section 7.1.2 describes the groundwater resources.

Gordon Creek is not considered a region with potential for large scale groundwater development. Most groundwater use is tied to spring discharge and mining consumption. The potential recharge areas delineated in Figure 7-4, show a limited recharge potential except in the northern portion of the permit area and in canyon bottoms.

The Gordon Creek area is, however, considered a regional recharge area to groundwater. The area heavily faulted. Faulting and fracturing provide conduits for surface water to enter the groundwater and allows movement between aquifers. The plan states that a relatively small number of springs are within the proposed mined area which supports the theory of limited recharge. However, the adjacent area has numerous springs, mostly associated with fault/fractures systems and the previously mined adjacent areas are discharging water from associated fractures. (See Table 3, which presents a summary of the springs found in the permit adjacent area.)

The major faults that surround the proposed mine workings are associated with a graben. The graben is within the North Gordon and Fish Creek fault zones which trend North and South, and North 60 degrees West, respectively. The faulting appears to have influenced the location and orientation of Gordon Creek and influences the locations of springs and seeps in the permit area. Another major structural feature potentially controlling groundwater occurrence is the Beaver Creek Syncline which trends NE-SW and dips at approximately 3.5 degrees.

The regional aquifers are the Emery and Ferron Sandstone, which are not considered to extend into the Gordon Creek area (thus, the mine area). Other important aquifers are the Star Point Sandstone and Blackhawk formations which are located in the mine area. Locally, potential water bearing members below the Hiawatha Coal Seam include the Blackhawk-Star Point aquifer. Both the Blackhawk and Star Point Formations serve as sources of spring and seep flows. According to Price and Arnow, 1974. The upper cretaceous sediments of the area have low hydraulic conductivities and specific yields of 0.2 % to 0.7%. Two pump tests from wells drilled in the Blackhawk formation in Eccles Canyon indicate transmissivities of 21 and 16.3 gallons per day per foot. The Blackhawk aquifers are generally laterally discontinuous perched aquifers and fluvial channel sandstones.

The Hiawatha Coal Seam directly overlies the Star Point Sandstone. The Star Point Sandstone consists of the Panther, Storrs and Spring Canyon Sandstone members from the stratigraphically lowest to highest member respectively. The Spring Canyon Member is composed of fluvial shales siltstone and channel sandstones (Section 6.5.2.1). The Star Point formation is approximately 900 feet thick in the Gordon Creek area. Recharge to the Star Point occurs primarily from vertical movement through the Blackhawk. The plan suggests that due to the low vertical permeability the magnitude of recharge is limited. However, the vertical permeability from fractures in the area appears to be relatively significant. Within the adjacent area, springs issue from the Star Point formation through fractures in connection with previous mining activities as evidenced by springs issuing from the formation in Coal Canyon. The in-mine waters sampled at Horizon No. 1 Mine in 1995 and 1996 indicate the standing water in the mine has varied from 7,584.1 feet msl in December 1995, to 7,587 feet msl in May 1996, then to 7,585 feet msl in June 1996.

Above the Hiawatha, the Castlegate 'A' coal seam overlies the Aberdeen Sandstone. Drill logs suggest the Aberdeen Sandstone member thins near the mine and is discontinuous over the permit area. The sandstone is interbedded with siltstones and shales. This sandstone is not anticipated to be a significant aquifer, by the permittee, because it has a thin interbedded lithology and no springs in the permit or adjacent area issue from the formation (section 6). However at least one seep appears to issue from this formation in Coal Canyon.

The floor of the Castlegate 'A' seam is carbonaceous silty shale to fine grained fluvial sandstone. The plan stated that water has not been produced from the floor in previously

mined areas of the Castlegate 'A' seam. The roof consists of carbonaceous silty shales over 80% of the permit area and the remaining 20% consists of fluvial channel sandstones that initially produce water then tend to dry up. The general channel trend is NE-SW and the channels tend to increase in frequency to the West.

Other members containing aquifers above the previously mined portions in the Castlegate 'A' seam include the Castlegate Sandstone, the Price River Formation and unconsolidated alluvial sediment deposits. The Castlegate Sandstone is exposed in the central and northeastern section of the lease block and is approximately 300 feet thick in the Gordon Creek area. The Price River formation overlies the Castlegate Sandstone and occurs in the north eastern portion of the permit area. Additionally, unconsolidated deposits occur along valley floors and at the base of steep slopes. Some of these deposits are recharged from the Blackhawk and Star Point aquifers. The thickest alluvial deposits in the permit area occur along Beaver Creek.

Local Drilling Information and Occurrence of Ground Water

The information regarding baseline groundwater data collection is discussed in chapter 7, section 7.1.2.2. Four exploratory holes, drilled in the 1970's and 1980's, were monitored in 1995. Drill logs of Holes LMC-1, LMC-2, LMC-3, and LMC-4 are found in Appendix 3A. These holes were determined to be dry. Additionally, three wells were drilled and completed in the Spring Canyon Sandstone in 1995. The Spring Canyon Tongue of the Star Point Sandstone is estimated to be approximately 75 feet thick in the permit area and is the aquifer below the seam to be mined.

Table 2A and Table 2B were generated, in this TA, to present information gathered from the LMC drill holes and the HZ wells and were used in determining ground-water occurrences in the permit and adjacent areas.

**Table 2A
 LMC Drill Hole Information**

HOLE ID	DATE DRILLED	DEPTH DRILLED	DEPTH OF PLUG	1992 Drill Hole Depth ft msl (depth)	CASTLEGATE Elevation ft msl(depth)	HIAWATHA DEPTH*
LMC-1	Sept. 1976	900 ft.	600 ft.	7,852 (599 ft.)	7,658 (793 ft.)	Unknown*
LMC-2	Oct. 1976	568 ft.	50 ft.	7,682 (568 ft.)	7,732 (518 ft.)	Unknown*

LMC-3	Nov. 1976	836 ft.	665 ft.	7,556 (664 ft.)	7,590 (630 ft.)	7499 (791 ft.)
LMC-4	Jan. 1980	430 ft.	220 ft.	7,585 (215 ft.)	7,694.8 (105.2 ft.)	7,584.7 (215.3 ft.)

* Drilling completed before reaching the Hiawatha seam.

The data presented indicate that groundwater occurrence above, within, and immediately below the Castlegate 'A' seam is not continuous and may be inconsequential in the overlying strata to be mined within this permit term. Documentation of the LMC drilling procedure was provided in a notarized letter from Joseph A. Harvey to Rich White, Engineering Consultant for Horizon Mine, on March 24, 1992, (appendix 7-1). As stated in Mr. Harvey's letter, all these holes were drilled with air rotary, monitored for water occurrence, and found to be dry (during drilling). Following drilling the drill holes were injected with compressed air, and then mud for geophysical logging. The drill holes were abandoned by injecting cement. Mr. Harvey indicated there was an inability to cement the full length of the drill holes because there were large voids connected to the drill hole annulus; thus, resulting in the existing hole depths as measured in the 1995 monitoring.

If one can assume the drill holes would seep water during drilling, and given there were no noted water occurrences in the cuttings, then these drill holes indicate the stratigraphic members above the Castlegate 'A' seam are probably dry in the area covered by this permit term. LMC-3 is located north east of old workings developed from the Blue Blaze No.3, Castlegate 'A' Seam. Drill hole LMC-4 extends through the Hiawatha Seam, ending 213 feet into the Storrs Sandstone. LMC-4 penetrates old workings in the Hiawatha Coal Seam. Therefore, LMC-4 does not represent information on groundwater occurrences for the un-mined portions of the lease area. Water was found in the formations above the Castlegate 'A' seam in the HZ wells as presented in Table 2B below.

Section 6.5.1.1, states that Drill Holes LMC-1, LMC-2 and LMC-3 will be plugged and abandoned following state approved methods. Of the LMC drill holes, it seems as though well LMC-4 could provide information for the mined out area should it flood during or after mining. However, it appears to provide little useful information on aquifers in the baseline/operational phases for the proposed mining area.

Table 2B
HZ Drill Hole and Well Completion Information

Hole ID	Date Drilled	Drilled Depth ft msl (Depth from surface ft)	Completed Formation	Base of Hiawatha Coal Seam (ft msl)	Screen Completion	Minimum and Maximum Water Elevations 12/95-1/97
HZ-95-1	12/13/95	7,272.6 (1080)	Spring Canyon	7,331.6	7,277.6-7,287.6	7,570.7 7,585.9
HZ-95-1S	12/5/95	8132.6 (220)	Blackhawk	NA	8,101.6-8,110.6	8,221.5 8,224.0
HZ-95-2	12/5/95	7,146.3 (1200).	Spring Canyon	7,189.3	7,151.3-7161.3	7,517.6 7,519.6
HZ-95-3	10/28/95	7,427.6 (470)	Spring Canyon	7,477.6	7,432.6-7,442.6	7,513.7 7,522.7

In building the potentiometric surface map, the permittee has assumed maximum water level fluctuations of + or - 30 feet based on Skyline Mine well data from 1982 to the present. The intent in using this data for this purpose is not clear since mining has occurred at Skyline and the change in water levels may not be considered "baseline" information as the changes may be the result of present mining activities. However this information is used to develop an estimate of water encountered over the life of mining.

With the information provided from the HZ wells, the permittee has constructed a potentiometric map for the Spring Canyon Sandstone. The presented information suggests the Spring Canyon aquifer has a hydraulic gradient of 0.014 in an east-southeast direction. The overlay of the potentiometric surface and elevation of the Spring Canyon Tongue was used to estimate the saturated portion of the coal formation. The plan suggests that the Hiawatha Coal Seam is saturated and water may be intercepted early in the mining operations.

Two potentiometric surface maps were developed. The first was based on water elevation data obtained in December, 1995. Another map was developed based on the data obtained in September 1996. Data obtained after initial completion in July and August 1996 show the surface water elevation remained relatively steady in Well HZ-95-2 while other water levels varied. Water elevations decreased by approximately nine feet at Well HZ-95-3 and, increased by 15 feet at HZ-95-1, from December 1995 to August 1996. It appears that the changes in water elevation at the well HZ-95-1 is related to seasonal fluxuations. Well water levels are presented in Table 7-1 of the plan.

A slug test was completed to determine the hydraulic conductivity of the HZ wells

except for well HZ-95-1-S. The hydraulic conductivity for well HZ-95-1 was determined to be 16.1 ft/day while HZ-95-2 and HZ-95-3 were 0.25 and 0.20 respectively. HZ-95-1 is located on the north side of Beaver Creek, and HZ-95-2 is located on the northeast side of the Beaver Creek Fault zone and is outside of the proposed mined area. These wells are all completed in the upper tongue of the Star Point but, were not completed through the formation.

The HZ wells were drilled near fracture systems as shown on Plate 6-1. Data from the wells indicate the unfractured portion of the Star Point Spring Canyon tongue has relatively low conductivities and does not transmit water quickly. Well HZ-95-1 is within a permeable zone associated with the fractured system which provides increased permeability over the other two wells completed in the Spring Canyon Tongue. The variation in the water elevation, the hydraulic conductivity determined by the slug test and drill log information suggest the changes in head are related to increase permeability through fracture porosity and responds to seasonal variation. Other factors could cause increase in head however, the increasing and decreasing pattern appears to be seasonal. The fracture associated with the well is shown to extend across Beaver Creek and into the proposed mining area. It is unknown at this time what component of Beaver Creek surface flows may have in recharging this fracture.

Groundwater was observed while drilling in the HZ wells above the Star Point at 100 to 600 feet below the ground surface. This indicates there is a potential for aquifers to be present above the Hiawatha seam in areas that were not previously effected by mining. Well HZ-95-1-S was completed at 205 to 210 feet below the ground surface (some where around 500 ft above the coal). Two drill holes previously drilled by Beaver Creek Coal Company near Beaver Creek were artesian flow and are referred to as BC-1 and BC-2. These wells are assumed to produce water from 80 to 100 feet below the ground surface. The plan states that the presence of artesian wells suggests these waters rest on aquitards and are overlain by confining units. Since, most springs issue above the presented potentiometric surface of the Star Point the water may not be in connection with the fractures. Another possible explanation, not discussed in the plan, is that the water bearing fractures are in hydrologic connection with the Star Point but there are no empty voids for water to move through and/or the low hydraulic conductivity in the lower formations transmits water slowly, allowing the water bearing zones to become saturated in the upper formations. Discharge would occur from springs at contact zones and areas where the fractured systems are expressed at the topographic surface. This would be similar to a dam with a bottom release spillway. The spillway only lets a specific amount of water through however, excess water may discharge over the emergency spillway. Both conditions could exist within the permit area.

The permittee has not completed the wells fully through the Star Point Formation. The Star Point sits over shale members through the proposed permit area potentially blocking vertical flow below the aquifer. However, where there are fracture related flows water has issued from formations below the Star Point. No wells were completed in the Blackhawk, where the

coal is to be mined.

The permittee has committed to discuss a more stringent monitoring program for Well HZ-95-1 prior to entering the northernmost mining block in Section 8 of the permit area. Currently it is the Division's recommendation that when mining progresses into the area near the fracture zone, monitoring will increase to monthly monitoring and increase to weekly monitoring if water is expressed from the fracture, or if increased flows are expressed from the roof or floor. The permittee should take measures to ensure that access to the wells and data from the wells may be collected over the period where mining will occur near the fault system. Additionally, the hydraulic conductivity of the alluvium and HZ-95-1-S, and stream flow of Beaver Creek should be analyzed if large quantities of in-mine water are associated with mining this area.

The permittee's 5 year mine plan and predicted future mining will occur under the Beaver Creek and through Well HZ-95-1. Thus, eliminating the third well used to monitor the Star Point piezometric surface. The permittee will, therefore, need to supply additional well(s) beyond the extended lease area. Since mining this area is not approved under this permit review, this request is provided for consideration as a future baseline need. It is recommended that placement of the wells be promptly conducted and coordinated with the Division. It is recommended the well(s) be completed in each water bearing formation above, within and below the coal seam to be mined. It should be noted that the deficiency from the previous Blue Blaze Mine proposal required the well be drilled through the Star Point Formation in order to mine into the Hiawatha Coal Seam but, this request was not followed.

Previous Mining History

The location and extent of all known, abandoned, underground mine workings within the permit area and adjacent area are shown on Plate 3-3, Figure 3-1, and Figure 3-2. Figure 3-1 shows the Consumer's Mine and the Blue Blaze Coal Co. #3 Mine have mined coal from the Castlegate 'A' Seam underneath Beaver Creek.

According to the permittee the Gordon Creek #2 Mine, operated by Beaver Creek Coal Company (BCCC) in the Castlegate 'A' seam, received sporadic occurrences of groundwater inflow which dried in a short time period. The Gordon Creek #3 Mine, operated by BCCC in the Hiawatha seam (located in Coal Canyon, east and down gradient of the permit area), received approximately 400 g.p.m. inflow when a 12 foot graben was encountered in the northeast section of the mine. Water was produced from the floor. When retreat mined later the area was dry, as a result of previous dewatering or elevation differences up-gradient of the mine. It was also deemed possible that groundwater stored in the fault zone did not have a significant recharge rate that maintained the flow. Within the past 10 years an area below Gordon Creek #3 Mine has received increased flow from springs. It is suspected that currently much of the groundwater collecting in the abandoned Gordon Creek #3 and #6 Mine is draining toward this

fracture. Until baseline information was provided by Horizon there was no monitoring of this site. However, there has been a notable vegetation change (Cottonwood die back and increased wetland species) and increase in flow north west of the junction of County Road 290 and the Beaver Creek #3 road.

Springs

Baseline reconnaissance information was gathered in the field with former Oil, Gas and Mining employee, Darin Woden, from 1988 to 1990. Other information was derived from state and federal published open file reports. A complete spring and seep survey in the proposed permit and adjacent area was conducted in 1996. Plate 7-1 identifies springs in the permit and adjacent area.

Table 3
Spring Survey Summary

(Summary of information from Plate 7-1 for this permit term only, Figure 7-3 and Appendix 7-2)

Drainage	Number of Springs located spring and formation*	Elevation (ft msl)	Water Quality	Water Quantity	Comments/ Characteristics
Coal Canyon	6 springs, July 1996 CC-1,-5,-6 (kss or km17) CC- 2(Kba) CC-3, -4 (Kbm 2-4)	CC-2 to CC-4 occur between 7,675 ' and 7,925' CC-1, CC-5, and CC-6 occur at approximately 7,360 '	CC-2 -CC-4 pH from 7.35 to 7.79 SP.Cond. from 788 to 922 ohms CC-1,-5,-6 pH from 7.34 to 7.69 SP.Cond. from 714 to 788 ohms	CC-2 -CC-4 flowed < 1 gpm CC-1 flowed 10 gpm, CC-5 flowed 2 gpm and CC-6 flowed 20 gpm	Flows in this area are likely affected by previous mining activities. CC-1, -5,-6 are issuing from a fault down stream of Gordon Creek 3 and 6.
Unnamed drainage west of Coal Canyon	5 springs MC-1, MC-2, MC-3, MC-3a,-MC-4	Between 7360' and 7450'	MC-4 ph ranged from 7.58 to 7.97 while Sp. Cond. ranged from 747 to 1068 ohms	MC-4 flowed at 2 gpm from 7/96 to 10/96.	
Upper Beaver Creek Drainage south and west of the Main fault bounding the permit area.	Upper drainage 10 springs and seeps CV-1,-2,-3, -4, (Kbm 1-4) CV -5, -6, -30, -31, -32, (Kbm 1 CV-4 fracture related)	CV-1,-2,-3 and SP-9 occur between 8,480' and 8,640' CV -4, -5, -6, -30, -31, -32, occur between 8,720' to 8,960'.	pH ranged from 6.89 to 7.37 while Sp. Cond. Ranged from 250 to 429 ohms	CV-1,-4, -5, were Seeps. CV-6, -30, -31, -32 flows were 1 gpm to 2 gpm. CV-2, and-3 flowed at 15 and 9 gpm respectively.	These springs may be in line with a fracture in connection with SP-4, and SP-1 (Interim Geologic Map of the Jump Creek Quadrangle).

Drainage	Number of Springs located spring and formation*	Elevation (ft msl)	Water Quality	Water Quantity	Comments/ Characteristics
Beaver Creek Drainage Beaver Creek and Sand Gulch	5 springs and seeps GV-32 -Beaver Creek(Kbm 1-4/fract) GV -25, -26,-27,-28 Sand Gulch (Kc and GV-25 fracture)	Between 8400' and 8880'	not obtained	GV-32, Seep GV-25, -26,-27,-28 flows were 3 to 5 gpm.	Springs located within the existing and proposed mine lease area.
Beaver Creek Drainage , Unnamed Drainage North of Sand Gulch	4 springs and seeps GV -10, -11, -12,(Kp) GV-13 (Kc).	Between 8,640' and 9200'	not obtained	and GV- 12 flowed at 1 gpm or less GV--10,-11, flowed at 10 and 18 gpm. GV-13 flowed at 50 gpm.	Springs located within the existing and proposed mine lease area.
Beaver Creek drainage /Beaver Creek outside of the major fracture.	10 springs and seeps GV-1, -2, -3, (Kc fracture related) GV-15, 14,(Kbm 1-4) GV-16, -21, -22, -23, -24 (flow from alluvium fracture associated Kc Kp).	Between 8,150' and 8,400'	not obtained	GV-1, GV-16 Artesian Wells 50 and 30 gpm. GV-2, 3, flowed 8, 10, GV-15, -22, -23,-24 seeps to 4 gpm GV-25 flowed 25 gpm.	Artesian and larger flowing wells appear to be in connection with the Beaver Creek and Jump Creek (covered) fault zones.
Beaver Creek drainage, Jump Creek/Un-named Drainage outside of major fracture.	6 springs and seeps GV-9, (fracture associated Kc) GV-8, -7, -6, -5, (Kc) GV-4 (associated with Jump Creek Fault)	Between 8,170' and 8,640'.	GV- 9 and -6 are described as Mineral springs.	GV-9, -6, -5, seeps to 1 gpm GV-8, -7, flowed at 4 and 5 gpm GV-4 flowed 18 gpm and from the hillside at 40 gpm.	

* formation was obtained from a map and not verified on the ground.

Kss - Storrs Sandstone member
 Kba - Aberdeen Sandstone
 Kbm - mudstone members
 Km - Mancos shale members
 Kc - Castlegate formation
 Kp - Price River formation.

The baseline sampling information was gathered for springs which issue from the Blackhawk Formation. These springs were characterized as Calcium Bicarbonate type waters.

Table 4
Baseline Spring Sampling Summary
 (Summary of information from Plate 7-1, Figure 7-3 and Sections 7.1.3, 7.1.5 and 7.2.6)

Sampling Point	Monitoring History	Location (Formation)	Water Quality	Water Quantity	Comments
SP-1 1989 to present	Station #1 1989 through 1993	Issues from Hillside and flows into Jewkes Creek (Blackhawk Sandstone unit above coal seams 8195 ft msl.)	TDS 230-330 mg/l pH 7.5 - 8.5	Late Spring 10-15 gpm High flow on 5/89 was 45 gpm Late Summer/Fall 5 to 6 gpm	
SP-2 1989 to present	Station #2 1989 through 1993 (This description matches the station number 1 previously; Channel in North Fork of Gordon Creek.)	Issues from Hillside and usually flows approximately 100 feet (Blackhawk, 8005 ft msl)	TDS 480-540 mg/l pH 7.5 - 8.5	Flow in Late Spring 1-2.5 gpm Flow in Late Summer/Fall <1 gpm Dry 7/1991, 8/1991, through 12/1992	Spring flows through alluvium below the point of origin.
SP-4 1989 to present	#4 1989 through 1993	Jewkes Creek Drainage flows along road empties into Jewkes Creek (Blackhawk, 8102 ft msl)	TDS 350-480 mg/l pH 7.5 - 8.5	Flow in Late Spring 1-2.25 gpm Flow in Late Summer/Fall <1 gpm	
SP-6 1989 to 1995	#6 1989 to 1995	Upstream from the proposed mine portal (Blackhawk)	N/A	dry from 1989 through 1995	This location is not a spring and will not be included in future monitoring

Sampling Point	Monitoring History	Location (Formation)	Water Quality	Water Quantity	Comments
2-6-W	Gunnison Homestead Spring	Tributary to Beaver Creek near confluence of spring discharge channel and Beaver Creek (Blackhawk)	not discussed	3-136 gpm the 136 gpm included snowmelt runoff.	
SP-9	Jewkes Spring U.S.G.S. 1979-1983 Station 2-5-W Beaver Creek Coal Company 1985-1995	Near Beaver Creek Channel, south west corner of proposed LOM permit area. (Blackhawk, 8550 ft msl)	TDS 240-300 mg/l pH 7.5 - 8.5	Typical Late Spring flow 20 to 60 gpm decreasing late fall 1.10 to 38 gpm (Maximum flow on 7/85 was considered spurious).	Location mapped on Figure 7-3

In Section 6.4.2 the plan states a series of springs in the North Fork of Gordon Creek, in the northwest corner of Section 18, T13S R8E, may be related to faults bisecting the area. The North Fork drainage may have formed subsequent to, or contemporaneously with, the movement along the Gordon Creek Fault Zone.

The Homestead Spring is identified as one of the main contributing springs to Beaver Creek. The permittee has included this spring as a baseline monitoring site to provide information on the flows contributing to Beaver Creek. This information will be used to determine the climatic variation, as it is believed the recharge to this spring is outside of the potential impact area due to its location relative to the fault system.

Groundwater Quality

Groundwater collected from the HZ wells in December 1995, November 1995, and January 1996 were affected from the foam drilling fluid used during installation. Data analyses indicate TDS ranged from 380 to 680 mg/l. Due to potential effects from the foam drilling, representative water quality data is not available.

The water quality of the wells, without influences from the drilling fluid, are not available and are not proposed to be presented from the permittee. The permittee has proposed that water elevation be the only data obtained at the HZ wells. It was stated that the intensive pumping required to obtain a sample with the slow recharge rates and the slow recharge would

also influence the ability of the well to reach equilibrium following sampling. Currently, the water elevation is of more relative importance. However, it would appear that recharge to Wells HZ-95-1 and HZ-95-1-S are not as tight and water samples could be obtained to characterize the signature of the water quality of these two points. The permittee feels that in mine monitoring along with spring monitoring will adequately characterize these waters. TDS in the Star Point Sandstone was presented as ranging from 335 to 391 mg/l to characterize water quality, While the Blackhawk Formation varies from 63-796 mg/l, Waddell et. al. (1981).

Two water quality samples were collected in the Blue Blaze No. 1 Mine workings, in May 1992 and one in November 1995. The water was determined to be a calcium bicarbonate type with TDS ranging from 414 to 452 mg/l and pH from 6.8 to 7.66. Groundwater samples collected in-mine at the Horizon #1 Mine in 1995 and 1996 show pH ranging from 7.38 and rising to 8.36, with specific conductance ranging from 485 to 595 ohms.

Surface-Water Information.

The Horizon Mine lies within the headwater streams of the Price River Basin. Major drainages within the permit and adjacent area are: Beaver Creek north of the mine site, North Fork of Gordon Creek and Gordon Creek south of the mine site. The disturbed area drains from Jewkes Creek into the North Fork of Gordon Creek. The State Division of Water Quality classifies Gordon Creek as Class 3C and Class 4 waters. These classifications are designated as: non-game and aquatic life and agricultural uses, respectively. Beaver Creek, is located over the future proposed mine workings and, is classified as 1C and 3A, designated for domestic and agricultural uses respectively. Downstream of the proposed disturbed area in Gordon Creek there are fisheries. (For further discussion see the **Fish and Wildlife** sections in this TA.)

Drainage adjacent to the proposed disturbed area are named for referencing purposes as shown on Plate 7-4. The following designated names are assigned for the drainages flowing through the proposed disturbed area:

1. Jewkes Creek - the main drainage through the site which joins the North Fork of Gordon Creek's main stem at the southern boundary of the permit area.
2. Portal Canyon - this drainage is the first drainage entering from the west after crossing the permit area boundary and joins Jewkes Creek. The portal entries are located in this drainage.
3. Spring Two Canyon - is the second drainage entering from the west after crossing the permit area boundary and joins Jewkes Creek. This drainage is upstream of the disturbed area.

Streams within the permit area receive their maximum flows in late spring and early summer as a result of snowmelt runoff. Flows decrease significantly during the autumn and winter months. Jewkes Creek has experienced no flow periods during the winter and late summer months.

Beaver Creek is a perennial stream with base flow maintained by seeps and springs. Beaver Creek drainage follows the axis along the Beaver Creek Fold to the north and diverges northeast along a suspected fault zone. Beaver ponds are common in Beaver Creek and also play a part in providing perennial flows. Some of the springs contributing to baseflow include the Gunnison Homestead Spring, one mile west of the proposed additional lease area and Jewkes Spring one mile west of the permit area, near the northwest corner. Discharges from these springs have varied between 3 to 136 gpm and 1.1 to 38 gpm respectively over the baseline period.

The U.S.G.S., from 1960 through 1989, has maintained a gauging station (09312700) near the mouth of Beaver Creek several miles northeast of the permit area. The minimum annual discharge for this period was 284 acre-feet in 1981. The maximum annual discharge of 9,950 acre-feet occurred in 1981. The average annual discharge for the 29 year period of record was 3,310 acre-feet. Decreases in downstream flow are observed in Beaver Creek between monitoring stations SS-7 and SS-8. The decrease is most prevalent during the low flow season. This losing stream section may occur due to either alluvium, fracture and fault systems or other unknown factors.

The permittee discusses the annual variability of flow in Beaver Creek. Although there is annual variability, the variability in base flow related to snowfall and possibly spring runoff would provide more significant information. Snowtel survey and precipitation information, where available, should be used to compare annual base flow changes with the precipitation rates.

Jewkes Creek drains a watershed area slightly greater than one square mile and discharges to the North Fork of Gordon Creek. The permittee has referred to this stream as intermittent. The flow data submitted indicates that normally the creek flows all year at Sampling Point 5, but becomes intermittent at Sampling Point 3. According to information contained in the plan, Jewkes Creek flows diminish in a downstream direction beyond Sampling Point SS-5. Streamflow infiltrates into the alluvium and does not reappear immediately downstream. A potential reason for the diminished flows in this area may be due to recharge of subsurface soils in the riparian area near this monitoring site and possibly losses to fracture systems. Characterization by observation in the North Fork of Gordon Creek was conducted to determine whether this flow re-emerges as constant flow downstream; no re-emergence was noted.

The North Fork of Gordon Creek flows along County Road 290 southeast of the

permit area. The elevation of the creek is lower than the Hiawatha Coal Seam. The plan suggests mining the Hiawatha Seam would not affect the quantity or quality of flow in the North Fork of Gordon Creek. However, the plan also shows the Spring Canyon Aquifer below the Hiawatha Coal Seam contains water, and mining might reduce the piezometric water elevation potentially affecting water discharged to the surface water in this stream. Discharge from the Starpoint aquifer to this stream section are to be characterized through sampling of springs and the UPDES discharge permit should minewater discharge occur.

The five year mine development plan, as shown on Plate 3-3, illustrates a proposed lease area to the north and east of the currently designated permit area. Future mining operations may take place under Sand Gulch and an unnamed drainage to the north. Baseline information is presently being collected for this area. Plate 3-3 shows the major fault systems which run northeast and southwest of the proposed mine operations. This fault system most likely influences groundwater flow and occurrence and may delineate the potential groundwater impact area adjacent to the proposed mining. The graben and fault system appears to extend all the way to Jump Creek. Additional, baseline information will be necessary to permit mining further north. Future baseline sampling should focus on the springs and surface waters potentially impacted through intercepting water from faults and fractures. Baseline information being collected for future mining was extended to Jump Creek.

Table 5
Baseline Surface Water Sampling

Sampling Point	Location	Flow	Water Quality	Comments
SS-3 1993 through 1995	Channel in Jewkes Creek /below disturbed area upstream of the intersection with the North Fork of Gordon Creek.	Intermittent	TDS 388 to 799 mg/l. Total Fe <0.02 to 8.7 mg/l Total Mn <0.01 to 0.05 mg/l TSS <1 to 72 mg/l pH 6.25 to 9.5	Flows most of the year.
SS-5 1993 through 1995	Jewkes Creek upstream of the disturbed area but downstream of the confluence with Spring Two Canyon.	Perennial	TDS 198 to 550 mg/l. Total Fe .05 to 3.9 mg/l Total Mn 0.05 to 1.0 mg/l TSS 1 to 245 mg/l pH 6.7 to 8.99	

Sampling Point	Location	Flow	Water Quality	Comments
SS-6 1991 through present	Right Fork North Fork Gordon Creek In the east Drainage above proposed portals and disturbed area	Ephemeral	Removed from proposed monitoring schedule. Samples were never obtained.	This should be monitored on the same day as sites 3 and 7 when sampling during a precipitation event or snowmelt period.
SS-7 1991 through present	Beaver Creek above the proposed future permit area outside of potential subsidence zone.	Perennial	TDS 216 to 353 mg/l. Total Fe 0.05 to 5.19 mg/l Total Mn <0.1 to 0.19 mg/l TSS <1 to 297 mg/l pH 6.0 to 8.54	Beaver Creek tends to have a lower TDS than Jewkes Creek.
SS-8 1991 through present	Beaver Creek station downstream, does not appear to be downstream of potential impact area for future mine plan.(see Plate 3-3 and 7-1).	Perennial	TDS 192 to 357 mg/l. Total Fe <0.02 to 1.3 mg/l Total Mn <0.01 to 0.078 mg/l TSS 4.0 to 52 mg/l pH 6.6 to 8.69	Flows tend to be lower than the upstream Beaver Creek station. Located near the Fault system.
SS-11	Sand Gulch Tributary of Beaver Creek Drainage upstream of the Northeast Fault	Perennial trough August winter flow not available.	pH 8.12 to 8.96 Sp. Cond. 163 to 353 ohms.	Associated with future mining and potentially the fault crossing Beaver Creek.
SS-10	Unnamed tributary North of Sand Gulch tributary to Jump Creek Drainage upstream of the Northeast Fault	Intermittent dry in July	pH 8.12 to 8.96 Sp. Cond. 74 to 110 ohms.	Data collection associated with future mining.
2-2-W	Gordon Creek above confluence of North Fork Gordon Creek below the Hiawatha	Perennial	Not discussed.	Impact more likely to be below confluence because of fracture system.
2-3-W	Beaver Creek	Perennial	Not discussed	Monitored by Beaver Creek Coal Not found on any map, information may be found in the Gordon Creek #2, #7, #8 mine plan.

Sampling Point	Location	Flow	Water Quality	Comments
2-4-W 1982-	Beaver Creek 1 -1/2 mile west of permit area	Perennial	Not discussed	Monitored by Beaver Creek Coal
Upper North Fork Gordon Creek	Above Coal Canyon below unnamed drainage	Perennial	A pH of 7.8 and Sp. Cond. of 604 ohms	Flow upstream was 555 gpm on 8/7/96
Lower North Fork Gordon Creek	Below Coal Canyon	Perennial	A pH of 7.98 and Sp. Cond. of 522 ohms	Flow was 806 gpm on 8/7/96.

Baseline Cumulative Impact Area Information.

A cumulative impact area assessment was processed by the Division.

Modeling.

No specific modeling was presented.

Alternative Water Source Information.

In section 7.1.6, the permittee purports no significant impacts are foreseen to groundwater as a result of mining in the permit area. To meet regulatory intent the permittee has committed to provide mitigation measures as outlined in section 7.3 and section 3.4.8.2. In section 3.4.8.2, in the subsidence mitigation plan, the permittee states that should substantial groundwater inflow occur in-mine and impacts are indicated through monitoring, mitigation measures will be provided and may include: attempts to seal off inflow, increased monitoring, lining of stream bed through the affected area and, replacement of lost water. The permittee has committed to enact a mitigation plan should mining impacts be identified under section 7.1.6. An extended mitigation plan would be correlated with Water Rights and UDOGM.

Information provided in the plan indicate the water rights are leased and are not an acquired right. Therefore, the permittee would have to obtain other methods to replace a water right use, should diminution or quality of a water right be impacted through mining activities.

Probable Hydrologic Consequences Determination.

Acid- and Toxic-Forming Material

The plan discusses the presence of acid-forming and toxic-forming materials in the Probable Hydrologic Impact section. Additional information provided in other sections of the plan are summarized below:

1. Disposal of waste rock from partings and splits will be placed in dry underground workings within the permit area when practical. No acid-forming or toxic-forming materials are present in the overburden or underburden for samples analyzed (section 6.5.7.1), suggesting no acid or toxic forming materials will be in the partings. The waste rock will be backfilled and compacted prior to second mining (section 3.3).
2. If underground waste cannot be blended, sold, or gobbed, arrangements will be made to dispose of this material in permitted refuse piles at a nearby mine.
3. Noncoal waste rock from initial development will be incorporated as fill in the mine yard (section 3.3).

Table 6-5 summarizes the quality of the Hiawatha coal seam. The acid base potential from each of the three coal samples collected at the HZ-series holes vary from -9.1 to -13.6 tons CaCO_3 per 1000 tons of material these values suggest the coal has a potential to be acid-forming (section 6.5.6). Tests for acid-forming and toxic-forming materials were conducted on roof and floor samples in LMC-4 and HZ drill holes. One sample contained a high pyritic sulfur content of 0.24 percent. The permittee suggests this pyritic sulfur content is likely of limited areal extent. In section 6.5.6, the permittee presented core sample analysis obtained from the Hiawatha Seam coal. The presented analyses show total sulfur content from 0.38% to 0.61% of which 0.02% to 0.07% is shown to be pyritic sulfur.

Coal will be stored on the surface for short periods and runoff from the coal stockpile will be routed through the sedimentation pond where it will mix with runoff water that is more alkaline. However, all of the coal will not be removed in the mining process and much of this coal will be in contact with air and water during and following mining operations. This may cause oxidation and lowering the pH of water coming in contact with the pyritic sulfur.

Acid-forming discharges are uncommon in the region and acid forming materials are not known to be extensive in Utah coal mines. Recent water samples obtained from the old Blue Blaze No.1 Mine workings are shown to have a pH of 8.65 to 8.63 and have increased from

the 1995 pH values near 7.4. Should the presence of pyrite in the mined area cause a decreased pH locally, the mixing with higher pH water in the system would result in localized effects in the permit area and would not likely occur off the permit area due to downstream buffering.

Where material is trucked to permitted refuse piles at a nearby mine receiving the waste, the acid and toxic characteristic of this material should be known at the permitted mine.

Potential Groundwater Impacts

The following are considered by the Division to be the potential groundwater impacts in the permit and the hydrologic adjacent area:

1. Interbasin transfer of waters between Beaver Creek Drainage and Gordon Creek Drainage.
2. Dewatering fractures and associated springs or surface waters.
3. A change in the potentiometric surface.

The permittee states inter-basin transfer out of the Price River drainage cannot occur in this region. This is true. However, inter-basin transfer between Beaver Creek and Gordon Creek could occur. Currently, the presented information suggests the aquifer in the Spring Canyon Tongue has a hydraulic gradient of 0.014 to 0.019 ft/ft and flow is in an east-southeast direction. The permit area sits within a graben between two WNW-ESE trending faults. In the northwest section of the permit and adjacent area there is a gentle NW-NE dip associated with the Beaver Creek Syncline. The Beaver Creek Syncline axis trends and plunges to the north. Rocks dip 3-5 degrees on both limbs of the fold, except where steepened by fault drag or fault displacement. These structures influences the dip of the coal seam and may influence the potentiometric water surface that could result following mining.

The potentiometric surface maps presented for the Starpoint aquifer water ranges from 7,513 ft. msl to 7,580 ft. msl. The elevation of HZ-95-1 was 7,585.4 ft in July 1996. The standing water elevation in the Blue Blaze No. 1 Mine was 7,587 ft on 5/16/96, and 7,585 ft on 6/14/96; similar to the surface elevation in HZ-95-1. This could indicate an interconnection with the in-mine water and the fracture, but could also be due to local influences. The base of the Hiawatha is approximately 7,331.6 feet msl at Well HZ-95-1; approximately 7,477.6 ft msl at well HZ-95-3; and is approximately 7,189.3 ft. msl (288 ft. difference) at HZ-95-2. HZ-95-2 is beyond the proposed mining area and is on the other side of the fracture associated with the graben. The information presented indicates the Star Point aquifer is in connection across the fracture of the graben. The elevation to which coal is removed could potentially decrease the potentiometric surface in the permit area and could affect springs outside the permit area if there

is a hydrologic connection to the mined area. The only springs that currently are recognized as having a higher potential to be affected by mining are those issuing from the Starpoint below the coal to be mined.

The largest volume of water issuing from springs associated with outcrops of the Star Point include spring discharges in Coal Canyon which appeared to increase following mining of the Gordon Creek #3 and #6 Mines. Additional evidence of newly formed springs occur in the unnamed canyon upstream of Coal Canyon (based on discussions with Chris Hansen, Earth Fax Engineering). These springs discharge from the Star Point formation in the Storrs Sandstone member and outcrop at an elevation of approximately 7,360 ft msl, an elevation in line with the Starpoint piezometric surface. If the coal is removed at or below 7,331.6 feet, and if the water is in connection with the fracture feeding the springs in Coal Canyon and in the unnamed canyon to the west, these springs/seep could potentially be affected. As a result, a loss of head may relocate water flows along the geologic structure of the Beaver Creek syncline. Changes in quantity and quality to spring and surface water discharges associated with faults in hydraulic connection with the mined area, could result. The potentiometric surface elevation could be lowered and local changes in gradient and flow direction could result creating localized increases or decreases in flow and relocating discharges. This would continue until after mining ceases or water fills the mine to an elevation where discharge would again occur from these fractures. It is likely that water issuing from the Coal Creek area could be maintained through locating sumps in the areas that would recharge the springs, should it be determined that there is a hydrologic connection. It is also probable that localized recharge provides some component of flows to this spring which may not be affected.

The proposed operations have the potential to affect the springs in Coal Canyon and the unnamed canyon to the west (depending on the depth to which the coal is removed). Baseline flow data and field parameters were the collected for this area.

A fracture is present at the north end of the permit area. This fracture appears to have influenced permeability in HZ-95-1 and is shown to cross Beaver Creek into the permit area. Mining into the region where this fracture occurs could result in dewatering the fracture. Currently it is unknown whether Beaver Creek is in connection with the fracture, and whether it provides some recharge to the fracture. The seepage evaluation conducted on Beaver Creek in 1996 shows a measured loss in flow between HZ-10 and HZ-11 (figure 7-4a) a loss of 6.8 gpm. It is not certain whether all or part of this loss is due to alluvial transmission losses. The amount of loss was considered insignificant, in the plan, because it could have easily been caused from measurement error.

Several other points presented in the plan suggests that if an interconnection exists between Beaver Creek and this fracture losses associated with mining would not be significant. These are summarized below:

- 1) There is approximately 600 feet of strata between the Starpoint and the overlying aquifer.
- 2) Recharge following pumping is slow in well HZ-95-1.
- 3) The overburden exceeds the 500 ft of overburden where subsidence has effected streamflow according to the Miller Creek Study.
- 4) The differences potentially reducing the likely hood of subsidence affecting Beaver creek v.s. the Miller creek study are as follows; the sandstone strata above the Hiawatha Seam has an increased thickness over that present in the Miller Creek area; longwall mining is not proposed; only one seam will be extracted.
- 5) Fault breccia show healed mudstone units when observed at depths greater than 500 feet.

The permittee has committed to increased monitoring over the period where mining will occur near the fracture for water level monitoring at Well HZ-95-1 and Beaver Creek.

Due to low permeability formations and, due to planned avoidance of faulted zones, the permittee projects inflow to the mine from faulted zones to be minimal (section 7.1.2.2). An inflow analyses which assumes porous medium flow rather than fracture flow was presented and then adjusted according to Lines, who stated that fractured bedrock flows are on the order of one magnitude larger than that predicted for unfractured bedrock. The inflow from fractured bedrock, using Lines (1985), was estimated to be 0.08 cfs or 36 gpm. The inflow estimated to be present from the existing and potential future mining varied from approximately 36 to 90 gpm. This prediction was based on a hydraulic gradient of 0.014 ft/ft. Based on the 1996 data the inflow value may fluctuate seasonally.

The permittee has stated the fault associated with the water in the Beaver Creek No. 3 Mine will be closely monitored and periodically drilled horizontally into the fault zone. This should aid in avoiding water in this zone. The permittee should document these activities in the annual report.

The permittee has concluded that the Hiawatha Coal Seam will be saturated from the beginning of mining operations. The Division believes the rate of inflow may increase locally, this will depend primarily on whether a faulted zone is encountered that contains groundwater in storage or, whether it is in connection with an overlying perched aquifer.

The coal seams dip away from the portal entrance and excess water will be

sumped underground. Waste rock from the mining production is proposed to be gobbled underground and backfilled. Due to removal processes the gob has increased the surface area, which increases the potential for oxidation, should water and air come in contact with the materials. Potential water quality changes that might occur would be increases in TDS (ions in solution) and increased potential for acid and toxic formation.

Baseline data obtained from an underground mine water sample from the Horizon No. 1 Mine is found in Chapter 7. The permittee has averaged baseline data sources and compared the data with the data obtained in-mine. The in mine values fall within the 95% confidence interval for and according to the plan suggest the water should not be adversely impacted. However, this method ignores potential seasonal variations. The permittee has indicated calcium carbonate rock dust will be used in mining thus, minimizing impacts to water quality. See the section above on **Acid and Toxic Forming Materials** in this TA.

The permittee states "It is not anticipated that large quantities of ground water will be encountered throughout the duration of mining". The Division believes the potential for impact increases, if water is intercepted by mining through paleochannels associated with fractures, or where a water bearing fault/fracture system is intercepted by mining activities. The potential for impact appears to be highest if fracture associated flows in the Hiawatha Seam are intercepted similar to the water interception which occurred in the Beaver Creek Coal Mine.

The permittee has estimated the "worst case" potential inflow through a porous formation (exclusive of fracture flows) to be 2.6×10^{-4} and to have an average potential inflow of 1.5×10^{-4} . Or, a flow rate of 9 and 5 gpm per section. Assuming six sections would be removed the total potential inflow would vary between 30 and 54 gpm. This information assumes a worst case scenario between 270 to 130 feet of head. The up gradient well HZ-95-1 had a maximum water elevation of 7,522.7 feet in the Starpoint Formation and the base of the Hiawatha coal seam is approximately 7,331.6 feet msl at Well HZ-95-1 therefore, the potential is that a decrease of head in the Star Point aquifer, of approximately 191 feet could occur at the mine-site over time. The extent to which this affects the adjacent area is limited to the interaction of water bearing members along the fault zones and recharge and discharge zones. The aquifer may be de-watered within the graben without interaction with the fracture/fault related waters across the fault, or may affect the waters across the fault system. According to information in the GEO-Hunt Consulting report, appendix 7-11, most faults in the Wasatch Plateau act as a barrier to bedding plane groundwater flow which causes an increased presence on the up-dip side and a groundwater shadow on the down-dip side.

Potential Surface Water Impacts

On page 7-22, the permittee states that proposed mining operations will occur north of Gordon Creek and should not affect the quantity or quality of water in the drainage.

However, it was noted that approximately 400 gpm inflow was produced from the floor when mining the Hiawatha seam. This information, along with the dewatering estimates discussed above under the *Potential Groundwater Impacts* of this T.A., indicate there may be a potential to intercept groundwater flow and change the potentiometric surface of the Star Point aquifer immediately below the Hiawatha Coal Seam. This flow interception could impact base flows provide by springs in and near Coal Creek or, relocate the source of the flow. It is assumed the control point for the piezometric surface would likely be at the elevation related to the lowest point that the coal is removed. The coal dips 5.3% to the northwest, and outcrops at approximately 7,600 feet at Portal Canyon. Drill logs shows the depth of the Hiawatha Coal Seam to be at 7,499 feet at LMC-3 to 7,331.6 feet msl at Well HZ-95-1. The furthest extent of the block of coal to be removed is located between these drill holes. Therefore, the potentiometric surface (approximately 7,580 feet to 7513 feet) may be impacted and decreased to somewhere between 7,491 ft and 7,331.6 feet. As a result of the change in potentiometric surface the water quantity and water quality to Gordon Creek could be affected and change discharge rates at Coal Canyon. Quarterly flow rates will be monitored on the North Fork of Gordon Creek below this seep area. This proposal meets minimum requirements. However, it is not clear how the base flow will be differentiated from runoff influences with only quarterly flow samples. A continuous recording flume or more frequent low flow readings and one high flow reading would better meet the objective for monitoring this location.

The permittee indicates the water intercepted from the fault associated with the Beaver Creek Coal Company No. 3 Mine will be avoided when mining the proposed Horizon No.1 Mine. The fault will be avoided by evaluating maps, closely monitoring the activities in the fault area and, if necessary, periodically drilling horizontally into the fault zone .

Subsidence Control and Renewable Resource Protection

The Stream Buffer Zones will be maintained for 100 feet on either side of Beaver Creek within which second mining will not occur without regulatory approval. No mining under Beaver Creek is proposed under this permit term. Presently mining panels are set up to avoid Jewkes Creek.

The permittee has stated that mining is designed to preclude subsidence of perennial and intermittent stream reaches. The permittee references Gentry and Abel 1978 which indicate streams tend to be protected by upwarping of adjacent slopes during subsidence.

Mining has occurred in the Gordon Creek #2 area (mined over 40 years ago) and in the Consumers No. 3 Mine, Section 3.2.3. The following areas were previously mined beneath Beaver Creek.

- Swisher Coal Company mined under Beaver Creek in the northern most

west panel of the Castlegate 'A' seam in January 1978. Overburden is approximately 650 ft.

- Beaver Creek Coal company mined under Beaver Creek in the 'A' panel in September 1981. Overburden was approximately 425 feet.

The Division has received a public complaint that suggests subsidence has occurred in areas of Beaver Creek. This concern was under further investigation, with no definitive answers, because of seasonal constraints.

Although longwall mining subsidence occurs immediately following mining, room and pillar subsidence may not occur for a long period of time. The proposal to monitor subsidence annually for two years following cessation of mining is probably adequate for determining immediate subsidence response. However, prior to bond release the lack of, or presence of, subsidence should be confirmed. Mitigation measures are discussed under **Alternative Water Source Information** in this T.A.

Water Use

Average water use was predicted to be approximately 21 gpm with 15 gpm to be used underground and 6 gpm to be used in surface operation. The 37 gpm were considered consumptive use lost through the following sources; 6 gpm were estimated to be lost in surface consumptive uses; 25 gpm were predicted lost due to coal removal; another 6 gpm is estimated for evaporative loss through mine ventilation. With future expansion it is predicted that up to 50 gpm would be discharged from the mine. According to information in the water right the total amount of water estimated to be consumed by the mine were presented as 9.1 acre feet, consumed in-mine and, 6.8 acre-feet consumed for surface operations for, a total of 15.9 acre-feet of water per year.

The permittee believes water will need to be pumped into the mine only during initial development and during peak operating procedures. It was estimated that approximately 60 acre-feet of water per year will be removed with the coal.

Sediment Yield

The potential for increased suspended solids and sediment loading to Gordon Creek is probably highest during the construction phase of operation and reclamation. The permittee has committed to monitor for turbidity of the water upstream and downstream of the site during the construction phases. A criteria for Class 3C allows a turbidity increase of 15 (NTU).

Increases in sediment during the operational period will be minimized through the use of a sedimentation pond and drainage controls. The permittee has also committed to store snow in sites that will directly drain to the sedimentation pond (Section 3.3). Following backfill and grading operations, sedimentation ponds are proposed to be removed. Alternate sediment control measures are discussed in Section 3.5.4.3.

Surface Water Quality

The permittee considers impacts from increases in TDS to be minimal because downstream increase occur when water comes in contact with Mancos Shale. Because downstream waters naturally degrade the use and quality of the upstream waters retains its importance. However, impacts to downstream waters, where the water comes in contact with the Mancos Shale, would not be notable.

The road to the mine is maintained as a gravel road. The use of road salting is not likely to occur. The county has requested Magnesium Chloride and Magnesium Oxide be used to minimize dust. Increases in these constituents may be seen during periods of runoff. Pre-existing and existing reclamation operations in the area also used this as a dust suppressant.

Hydrocarbons

Horizon Coal Company indicates diesel fuel, oils, greases and hydrocarbon products will be stored above-ground and may be spilled in the mine and on the surface during mining operations. An above ground 5,000 gallon diesel fuel tank will be located between the coal stockpile and the truck turn around, as indicated on Plate 3-1. A shop maintenance area will be located next to the mine office area.

The permittee proposes a concrete containment structure will be used and be sized to contain any spill, section 3.23. The permittee indicates spills will be handled in accordance with the Spill Prevention and Contamination Control (SPCC) Plan. This plan is provided in Appendix 7-10 without the certified signature required by the SPCC regulations. This certification should be present on the mine manager's copy. Elements of the plan include:

- Visual inspection of all tanks, associated valves piping and containment areas
- Procedure to notify the Mine Manager and contain the spill
- Procedure for reporting requirements for spills
- Procedures for preventing spills during filling tanks.

The permittee's proposal uses accepted practices for their SPCC plan. The permittee's operation plan includes cleanup procedures for small scale spills, and a commitment to retain absorbent materials on site. Because the permittee has not provided a valve to allow draining of surface water, water that collects in the concrete containment structure, maintenance pumping of excess water will need to be conducted to maintain the designed size. A copy of the SPCC plan will be maintained on file in the Mine Manager's office and the Mine Engineer's office.

Flooding or Streamflow Alteration.

The permittee discusses the potential for flooding as being diminished during operations. A reduced peak flow is expected through attenuating water in the sedimentation pond. In addition to the permittee's comments, it is likely that the water flowing through the culvert will have increased flow velocity over the natural velocities for the same discharge rates, however, the low gradient at the outlet will spread the water, slow the velocity, and promote deposition of sediment. The operator has provided a an impact basin below the culvert.

Changes will also occur due to reclamation activities. Currently the waters that exit from Portal Canyon are collected behind the waste embankment and are evaporated, used by vegetation or, seep through the waste pile. The reclamation of Portal Canyon will return the ephemeral flows from this canyon directly to Jewkes Creek. The permittee has provided riprap channel designs for the velocities that may occur from a 100 year- 6 hour event for Portal Canyon and has committed to develop a channel design that will encourage development of riparian vegetation in Jewkes Creek. Other potentials for streamflow alteration include an increased discharge through the operation period due to mine dewatering and other changes discussed under Potential Surface Water Impacts and Potential Groundwater Impacts.

Findings:

The proposed amendment is considered adequate to meet the minimum requirements of this section.

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:

General

General hydrologic inputs for determining design standards at the Horizon Mine are described. Soils at the site tend to be silty clay loam to loam within the Shupert-Winetti Complex and gravelly loam to loam within the Brycan, Rabbitex, Senchert and Curecanti Series. The SCS hydrologic groups B and C were used for these soils.

The Permittee has used a CN of 89 for the disturbed areas. This number is adequate at this time. However, should the Permittee propose additional buildings, road surfacing or pad surfacing the design CN would require re-analysis. The Permittee used a CN of 48 for the Curecanti/Oak-Aspen soil/cover type and a CN of 73 for the Senchert/Pinyon Juniper. The vegetation map indicates vegetation types other than those described for determining the CN. For the undisturbed areas draining the weighted value was increased to a CN of 70 which is higher than the estimated CN. Based on the increase in this value the design CN used is considered adequate.

Water Rights/ Water Use

Water for non-culinary use will be obtained from leased water rights. Culinary water will be obtained from the Price River Water Improvement District, hauled to the site and stored in an above ground storage tank designed in accordance with applicable Utah Department of Health regulations. Plans will be submitted for approval prior to construction.

A pipe was constructed to convey water from Sweets Pond to the mine, prior to this amendment. Following an objection to a request for a permit transfer the permittee declined to use the land at the point of diversion where Sweets Pond is located. Sweets Pond and associated pump facilities but, not the pipeline, are currently bonded by Mountain Coal Company at the #2#7 mine. See additional discussions of *Water Rights and Points of Diversion*, **Baseline Information** in this T.A.

Groundwater Monitoring

The permittee has provided a ground water monitoring plan under section 7.1.5. The permittee states “Data collected from the springs will allow quantification of potential impacts to perched aquifers within the permit and adjacent areas. Data collected from mine inflows will allow impacts to be quantified to all hydrologic resources that are affected by mine dewatering, and “Data collected from the HZ wells will allow quantification of potential impacts to the regional groundwater system.” Table 6 and Table 7 represent summaries of the groundwater sampling program.

Table 6
 Operational Spring Water Sampling

Sampling Point	Location	Formation	Monitored Frequency/Parameters	Comments
SP-1	Hillside flows to Jewkes Creek.	Blackhawk sandstone unit above coal seams.	Quarterly (when accessible) Flow/Parameters Table 7-2.	Spring sampling should be done at source when at base flow. Quantifies impact to perched systems.
SP-2 1989 through 1993	Hillside out does not usually reach Jewkes Creek.	Blackhawk	Quarterly (when accessible) Flow/Parameters Table 7-2.	Spring flows through alluvium below the point of origin.
SP-4 1989 through 1993	North Fork Gordon Creek Drainage bottom	Blackhawk	Quarterly (when accessible) Flow/Parameters Table 7-2.	Flows along the road to Jewkes Creek.
SP-9	Jewkes Spring	Blackhawk	Quarterly	
2-6-W	Homestead Spring.	Alluvial deposits.	Quarterly (when accessible) Flow/Parameters Table 7-2.	
GV-70	Markis Spring.	Blackhawk.	Quarterly (when accessible) Flow/Parameters Table 7-2.	Within area of future workings.
CC-5 1977-1999	Unnamed drainage up-stream of Coal Canyon.	Storrs unit of the Starpoint formation.	Quarterly	

MC-4 1977-1999	Coal Canyon.	Storrs unit of the Starpoint formation.	Quarterly	
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**Table 7
 Operational Groundwater Sampling**

Sampling Point	Location	Frequency	Water Quality Parameters	Water Quantity	Comments
Sustained in mine flows as close to point of issuance as possible.	Where flows of 2 gpm or greater occur flow will be recorded and a sample taken for water quality analysis. Flow from fractures will be mapped on the mine progression map. Flow will be collected quarterly if present for at least 30 days.	Quarterly while accessible.	Identified in Table 7-2	According to Table 7-2	
Discharged mine water	If necessary treated in underground sumps.	In accordance with permit.	In accordance with permit.	In accordance with permit.	Currently not a permitted activity. Will need permit approval.
Well HZ-1 HZ-1S HZ-2 HZ-3	Completed into the Spring Canyon Tongue of the Star Point Sandstone.	Quarterly.	None proposed.	Water level corrected to depth from ground surface.	

The permittee committed to submit quarterly and annual reports. These reports should be in the format required by the Division. A memo regarding annual report submittals is forwarded to the operators under R645-301-742.420, and outlines those requests. The permittee included a commitment, in the plan, to notify the Division if data indicate non-compliance with permit conditions.

The permittee has stated that data collected from springs will allow impacts to be quantified, and data collected from the HZ wells will allow quantification of impacts on the regional system. Since no representative water quality data has been collected from the HZ wells, the springs and mine-water inflow are proposed to be used to monitor water quality changes.

Should the mining operations intercept the fracture system connected with HZ-95-1, the location of these wells provide useful monitoring. Even with the lack of baseline data, these wells will be useful in determining the first year mining impacts. The position of HZ-95-2 is outside of the graben within which coal will be mined. This should provide information on whether there is hydraulic connection across the graben in the Star Point, or whether the graben acts more similar to a discreet unit. The location of HZ-95-1 will aid in indicating whether mining will cause dewatering of the fracture. The location of HZ-95-1-S will aid in determining if mining affects the shallow aquifer (100-200 foot depth) adjacent to Beaver Creek.

The permittee states that if, at the initial interception point, the flow exceeds 30 days continuous flow groundwater monitoring will be sampled quarterly. Representative points of inflow will be selected from the source. The permittee has committed to discuss with UDOGM a more stringent monitoring program for HZ-95-1 prior to entering the northernmost mining block in section 8.

Currently the proposed baseline/operational monitoring includes sampling at springs CC-5 and MC-4. The paragraph states the springs will be analyzed for flow, pH, conductivity, calcium, magnesium, sodium, potassium, carbonate, sulfate and chloride in 1997 through 1999. It should be noted that these springs are recent sources of water discharge or, have increased in flows and appear to be associated with previous mining activities. Although it is unclear, there is a potential that recharge sources could be affected by mining at Horizon. The Division should be sure to assess the need for continued sampling at these springs beyond 1999.

The permittee has committed to provide monthly flows below Coal Canyon on the North Fork of Gordon Creek when the site is accessible. The permittee states that this will aid in determining overall impacts of mining. Without the baseline information, the potential for identifying changes in flow related to mining may be difficult to determine, but operational monitoring would potentially provide useful information. For instance, if in-mine flows increase but, are not discharged and flows in the North Fork of Gordon Creek increased it may indicate there is a hydraulic connection with the Horizon Mine to those fractures. If the direction of flow changes and follows the geologic feature of the Beaver Creek Syncline the spring flows would decline. Other factors such as climate would need to be considered.

Surface-Water Monitoring.

Specifics on monitoring during the construction period were included in the plan and permittee committed to collect weekly samples during the operational and reclamation construction period upstream and downstream of construction. The parameter to be analyzed in the field is turbidity. Additional operational surface water monitoring is summarized in Table 8.

Table 8
Operational Surface Water Monitoring

Sampling Point	Location	Flow	Water Quality	Water Quantity	Comments
SS-3	Channel in Jewkes Creek /below disturbed area upstream of the intersection with the North Fork Gordon Creek and below the bypass culvert.	Intermittent.	Quarterly According to Table 7-5.	Quarterly.	
SS-5	Jewkes Creek upstream of disturbed area but downstream of the confluence with Spring Two Canyon.	Perennial	Quarterly According to Table 7-5	Quarterly	
SS-6	Portal Canyon Drainage and Spring Two Canyon Drainage.	Ephemeral.	Not proposed.	Not proposed.	
SS-7	Beaver Creek, upstream of the permit area outside of potential subsidence zone.	Perennial/ collected Monthly.	Quarterly According to Table 7-5 .	Quarterly	
SS-8	Beaver Creek downstream north east of permit area. Out of potential subsidence zone.	Perennial.	Quarterly According to Table 7-5	Quarterly	Additional seepage studies will be conducted with abnormal variations in flow between SS-7 and SS-8.
Lower NFGC	North Fork of Gordon Creek below coal Canyon	Perennial	Not Proposed.	Quarterly	
SS-10	Tributary to Jump Creek	Not determined.	Quarterly According to Table 7-5	Quarterly	Additional data being collected.
SS-11	Tributary to Jump Creek	Not determined.	Quarterly According to Table 7-5.	Quarterly.	Additional data being collected.
SS-12	Beaver Creek downstream of SS-8.	Perennial.	Not proposed.	Quarterly.	

Acid- and Toxic-Forming Materials.

The permittee has indicated that overburden and underburden samples will be gathered at 2,000 foot intervals throughout the mine and tested according to the Division requirements (section 6.5.7.1). The Division understands this statement to mean the permittee will test the materials according to the most current division guidelines for acid and toxic forming materials. See further discussions under **Acid and Toxic** headings of this T.A..

Transfer of Wells.

No transfer of wells are requested or approved at this time.

Discharges into an Underground Mine.

No discharges into an underground mine are approved. The underground water associated with the water right is intended to be obtained from water intercepted in the mined area and is not proposed to be transferred from other workings. See further discussions under "**Baseline Information, "Water Rights and Points of Diversion"**" in this T.A..

Gravity Discharges.

The dip of the coal is away from the portal faceups. Therefore, no gravity discharges are anticipated during the operations phase. The permittee's design provides a drain to prevent the accumulation of a hydrostatic head on the portal seams. There could be a potential for gravity discharges from the portal following mining depending on the accumulation of water in mine and the elevation of the piezometric surface following mining operations.

Water Quality Standards and Effluent Limitations.

The permittee provided a copy of the UPDES permit for the Horizon Coal Corporation in appendix 3-6. The permit is effective March 1, 1996 and expires at midnight on April 30, 1998. The permit number UTG040019 is authorized for discharge at outfall 001, latitude 39°41'37" and longitude 111°02'58"; to the North Fork of Gordon Creek. The TDS discharged from all mine water and decant operations is limited to one ton per day.

If underground water is encountered in excess of the amount required for mining, the water will be settled in underground sumps and discharges will be monitored to ensure that effluent limitations are met. Any such discharges will be monitored in accordance with the UPDES permit (sections 3.4.3 and 3.4.3.2). **The permittee has committed to obtain a UPDES permit prior to discharging water from the mine portal (section 7.2.3.2).** The permittee also

states that dewatering plans will be developed should it become necessary (section 3.3.1.6.). The permit, however, allows only one discharge point. The permittee has predicted that future mining will result in a discharge, therefore, the permittee has attempted to obtain an additional mine water discharge point. A letter from Steve McNeal, indicated that the application submitted on August 13, 1996 to meet their requirement was deficient and could not be processed without information on an oil skimming device, the pond volume and a water quality sample (from the mine). The water quality sample can not be obtained until the portals are developed and entrance to the mine is allowed.

Discussions of water quality standards are presented in section 7.2.2.2, tables 7-3, and 7-4. Other water requirements and plans needing submittal and approval from the Utah Department of Health include: culinary water facility and sewage facility plans. The permittee has committed to construct the sewage facility upon plan approval.

Diversions.

Undisturbed diversions are described in section 7.2.3.2 in the plan and summarized on table 7. All disturbed diversions are designed to carry the larger flow from a 25-year, 6-hour event. This is greater than the minimum regulatory requirement for a 10-year, 6-hour event. 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.

**Table 9
 Undisturbed Drainage Diversions**

Diversion	Diameter (culvert)	Function
UC-1	36"	Collects flow from UC-2 and UC-3, Portal Canyon and Jewkes Creek and routes it through the pad area.
UC-2	24"	Collects flow from upper Portal Canyon and routes it into UC-3.
UC-3	30"	Collects flow from upper Jewkes Creek and routes it into UC-3.

The permittee has considered any flow velocities less than 5 feet per second (fps) as non-erosive flows. This value is in literature however, other sources indicate velocities less than 5 feet per second may be erosive dependant on the soil types. Additionally, it is common in the region to have flashy high intensity flows that would exceed the erosivity of the minimum design requirements. Any additional need to control erosion from drainages within the pad area draining to the sedimentation pond will be determined through site inspection.

Roads are proposed to be surfaced with 12 inches of crushed gravel road base. All roads within the permit area drain to the pond. Culverts were placed to convey water under the roads to reach the pond. The ancillary roads will use waterbars and berms to control the water from the roads. The water bars were sized based on the 10-year, 6-hour event and the locations are shown on Plate 7-4. The maximum length between water bars is 250 ft on the well exploration road. The longest length of flow on the fan portal road is 494 feet. The permittee has stated the worst case peak flow estimate is 0.24 cfs based on a maximum area draining to each water bar of 8 acres and based on a maximum channel slope of 0.02 ft/ft, resulting in velocities of 1.48 fps. The water will be conveyed downstream in half-round culvert to minimize erosion over the outslope. In two locations the road will transition through ditch DD-1. Designs for the transition areas were presented.

Ditch DD-1 will consist of two segments. The upper ditch will consist of small ditches on each side of the canyon and will drain to lower DD-1. The ditch will be triangular in shape and will contain riprap to control erosion where velocities exceed 5 fps.

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. Plate 3-1 shows a buffer zone sign location. The text indicates buffer zone signs will be placed adjacent to Jewkes Creek, however, Plate 3-1 does not show a sign located upstream from the disturbance. 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 96-91-OSA. This permit expires on June 21, 97.

Sediment Control Measures.

The permittee began site construction prior to installation of the sediment pond. During this period alternative sediment control measures were used. Straw bales and silt fences were proposed to be placed in the stream channels of Portal Canyon and Spring Two Canyon to capture sediment. Berms, strawbale dikes and silt fences were to be located between stream channels and areas being disturbed. The permittee committed to cleaning these structures once construction is completed using backhoes and shovels.

The bypass culvert was installed from the lower end of the pad in an upstream

direction. Horizon Coal Company committed to limit construction to periods when the stream is not flowing to the extent possible. The original approved plan committed to bypass streamflow around construction activities using a diversion dike and flexible culvert. Under field conditions the applicant used a trench to contain upstream waters. No excess sediment was reported related to this action during the construction phase. The permittee constructed the sedimentation pond as soon as possible following construction of the downstream culvert sections. The ability of these proposed measures to control sediment was judged in the field through site inspections.

Additional operational erosion control measures include topsoil treatment and snow removal methods. The topsoil is proposed to be vegetated with interim cover as discussed in sections 3.4.4.1 and section 3.5.2. The topsoil piles will be contoured, fertilized and seeded. A berm will be placed around each topsoil pile to minimize soil transport. In section 3.3, the plan indicates that snow removed will be stored in sites draining directly to the sedimentation pond.

Alternate sediment control measures will be used on two areas. The upstream end of the topsoil stockpile area and the downstream most outslopes of the sediment pond embankment.

The topsoil area is treated by a strawbale and berm system and the pond outslope is treated by strawbales and silt fencing. Both sites were seeded to establish vegetative cover.

Siltation Structures.

Sediment ponds and other treatment facilities are defined by the regulations as siltation structures. The siltation structure at this site includes the mine sedimentation pond. For a discussion of the mine site sedimentation pond, see the **Sedimentation Ponds** heading below.

Sedimentation Ponds.

The sedimentation pond does not fall under the requirements of a MSHA structure. The pond will be inspected during and after construction by a qualified, registered, professional engineer. The pond will be inspected after each storm and cleaned as necessary. Embankments will be vegetated, to control erosion, with a temporary seed mix as described in section 3.5.5.2.

The permittee proposes to divert nearly all disturbed area runoff to the sedimentation pond, receiving runoff from 35.1 acres (appendix 7-4). The sedimentation pond will be mostly incised, except at the downstream face which will be an earthen embankment. The pond has been designed to contain the runoff from a 10-year, 24-hour precipitation event calculated to be 0.56 acre-feet. The permittee has assumed sediment production of 0.1 acre -

feet/acre/year from the disturbed area or 0.92 acre-feet annual sediment production. No sediment production was accounted for from the undisturbed area draining to the pond. The total capacity of the designed sedimentation pond is 2.6 acre-feet, allowing a runoff storage volume of 0.7 acre-feet of runoff and 1.9 acre-feet of sediment storage.

The sediment will be cleaned out of the pond at 60% of the total sediment volume at 7580.6 feet. The maximum capacity for sediment storage is proposed to be at 7582.0 feet. The clean out volume will be marked by a calibrated pole. One pole is generally not adequate to determine sediment capacity because the sediment tends to be deposited in deltaic form at the inlets. The commitment to clean out the accumulated pond sediment at 60% of the maximum volume will provide adequate space to retain the estimated runoff volume.

The pond will also have a 2" diameter decant pipe with a locking valve. Twenty-four hours after a storm, the pond is to be drained by opening the valve on the two inch decant line in the pond. This valve is to remain locked at all times except when decanting storm runoff. The inlet of the decant line is to be located at the elevation of the maximum sediment level. If the sediment in the pond should reach the maximum level approximately three feet below the elevation of the spillway. The permittee would have a difficult time draining the pond without draining sediment. Therefore the 60 % clean out level would need to be strictly adhered to. The applicant has provided a oil skimming device on the decant.

The sediment pond's spillway is designed to pass the peak flow of the 25-year, 6-hour precipitation event. The proposed spillway elevation is at 7585 feet. Calculations for the spillway do not route the flow through the pond. The design depth of the spillway is 1.5 feet, a flow depth of 0.08 ft, a width of 10 feet and side slopes of 2H:1V, the spillway will have 1.42 feet of freeboard between the top of the pond embankment and the maximum flow elevation. The permittee proposed this design is non-erodible based on a velocity of less than 5 fps.

Although the spillway designs meet the minimum requirement for a single open channel spillway design under R645-301-743.00. The spillway provides for the protection of aquatic life through the use of a proposed oil skimmer. The oil skimmer configuration is provided on plate 7-6a.

The permittee has analyzed the pond embankment designs for stability. Using a standard, circular failure model and the Hoek Circular Failure Charts, the permittee has found that the pond embankments have a static safety factor of 4.81 for dry conditions and 4.44 for saturated conditions (Appendix 3). The pond safety factor calculations assume an 11 foot embankment height and a slope angle of 2H:1V (26.56 degrees). The soils are assumed to have soil cohesion and friction angle of 35 psi, and 30 degrees respectively.

Pond designs, maps and calculations have been prepared under the direction and

certification of Richard H. White (State of Utah, Registered Professional Engineer #7102). The information and calculations contained in appendix 6 E are also certified by Mr. White.

Other Treatment Facilities.

No other treatment facilities area proposed at this time.

Exemptions.

No exemptions from using siltation structures or other sediment control measures were requested or are granted at this time.

Discharge Structures.

The sedimentation pond discharge structure was designed to maintain the downstream riparian area. In the design the base of the spillway has an impact pool. Water is then conveyed from the pool to the channel which carries flow from the bypass culvert outlet. The culvert outlet transitions to a low flow channel and flood plain design with a 4 foot bottom width and 0.6 foot depth and flood plain area.

Impoundments.

The only impoundment proposed for the operation is a sedimentation pond. In section 3.3.5 the permittee has committed to promptly report impoundment hazards to the Division and formulate remedial action and emergency procedures.

Casing and Sealing of Wells.

The permittee has stated that approvals and permits to drill wells will be received from the Division of Water Rights and appropriate government agencies. The final casing and sealing of wells is discussed in more detail in the section entitled **MINE OPENINGS** under **RECLAMATION PLAN** below.

Findings:

The proposed amendment is considered adequate to meet the minimum requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS

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

Analysis:

Monitoring Sampling Location Maps

Add to Engineer's analysis:

Surface water monitoring stations, including the baseline spring and seep survey, the operational monitoring program, and the UPDES sedimentation pond discharge point are shown on Plate 7-1.

Findings:

The proposed amendment is considered adequate to meet the minimum requirements of this section.

RECLAMATION PLAN HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Ground-Water Monitoring

See information under this same heading in the subsection entitled **HYDROLOGIC INFORMATION** under **OPERATION PLAN** above.

Surface-Water Monitoring

See information provided above under **Operation Plan** and information provided below under the subsection entitled **Sediment Control Measures**.

Acid- and Toxic-Forming Materials

In the plan, under section 6.5.7.1, is a commitment to monitor the acid and toxic

conditions of the overburden and underburden. Samples will be taken at 2,000 foot intervals throughout the mine and tested according to the Division requirements.

The permittee has committed, in section 3.5.4, to cover all acid- and toxic-forming material with four feet of non-combustible, non-acid and non-toxic, forming material that is a suitable growth material. The permittee has also committed to backfill a highwall or cut slope with any underground development waste that is temporarily stored on the surface and has committed to cover it with 4 feet of suitable backfill.

Where noncoal waste rock from initial development will be incorporated as fill. The permittee has committed to cover all coal waste with four feet of material. No coal or coal waste material will be used in the areas planned for reclamation for Portal and Jewkes Creek. Areas where coal waste was placed during construction of the site is presented in Appendix 3-8 Plate A.

Transfer of Wells.

No request for transfer of water wells are presented.

Discharges into an Underground Mine.

No discharges into an underground mine are applied for or granted for the reclamation area configuration.

Gravity Discharges.

The permittee has proposed that a drain be included in the stopping for portal closure. This site may have gravity discharge and should be monitored following mine closure through bond release to observe whether flow occurs from the portal. Other seeps may be in hydrologic connection with the mine and may need to be monitored.

Water Quality Standards and Effluent Limitations.

See information provided below under the subsection entitled **Sediment Control Measures**. The permittee will be required to demonstrate all applicable water quality requirements have been met prior to bond release.

Grading to Drain.

The permittee has committed to keep surface drainage from entering sealed entries in section 3.5.3.1. The permittee has committed to recontour the area to drain to the final reclamation channel in section 3-25. The contour information on the reclamation topography plate 3-7 shows the area to be graded to drain to the channel.

Diversions.

The permittee has proposed a drainage plan which reconfigures Jewkes Creek's drainage channel and Portal Canyon drainage channel. The new configuration of Portal Canyon eliminates the basin behind the existing embankment. And the reclamation topography contours show the adjacent area graded to drain to the channel.

Portal Canyon was designed to carry a peak flow of 9.95 cfs. The permittee's analysis assumed a one foot flow line because no high water mark was found. Since this is an ephemeral system it is often difficult to determine the height of the channel forming flows. Typically these flows are determined by high intensity short durations events in ephemeral systems. Based on the presented design information the design capacity of this channel exceeds the minimum required design flow for an ephemeral system. The ability of the Portal Canyon channel design to be stable will be demonstrated over the reclamation period.

The Upper Jewkes Creek channel is designed to carry 143.5 cfs in the combined channel and flood plain configuration while, the Lower Jewkes Creek channel is designed to handle a combined channel and flood plain flow of 150.6 cfs. The estimated capacity of the upper end of the disturbance was 27.65 cfs based on a high water mark. The estimated capacity of the downstream channel below the disturbance was determined to be 38.67 cfs. The reclamation channel capacity downstream is designed to exceed the capacity of the Jewkes Creek channel upstream and down stream of the site based on presented design information. The design will allow flows from the design 100- year, 6-hour event to pass through the channel and flood plain configuration.

The centrally-located channel section is placed away from the toe of steep backfilled slopes. A small riprapped channel section is designed to carry a low flow from the 10-year, 6-hour event. A sand filter blanket is provided to promote recharge into the surrounding soils.

The Jewkes Creek channel design is intended to provide a means to re-establish the riparian vegetation, existing at the site prior to disturbance, and is intended to simulate the pre-mining channel configuration while considering other site conditions. Some issues that are

related to the success of the permittee's proposal are based on the hydraulic characteristics of the soil adjacent to the channel, the maintenance of the culvert providing a gradient control downstream of the site and, the amount of sediment and intensity of flows being transported through the system. The ability of this design to be stable may be measured through the ability of the design to withstand flows received at the site.

According to Rosgren's Classification system Jewkes Creek would approximate an "E stream type" configuration. The channel type is chosen based on characteristics of the existing stream gradient through this section and, assuming a moderate sediment supply and healthy vegetation. The classic channel under these conditions would have a width to depth ratio less than 12, an entrenchment ratio greater than 2.2, a sinuosity greater than 1.5 and, a surface water slope less than 0.02. Because there is a high sediment load in the existing system (upstream logging presently occurring) and because the potential for additional flows from the reclaimed channel section and an increased slope, a channel more closely resembling a "C stream type" might possibly be more appropriate.

The upper channel RD-2 is designed to include channel slope ranging from 0.03 to 0.07 ft/ft which transition from the channel upstream of the reclamation. Loose rock check dams, 1 ft high with a designed spillway, and apron will be installed at upstream and downstream locations. The lower channel RD-3 is designed to include a channel slope ranging from 0.02 to 0.03 ft/ft which should assist in increasing the success of establishing riparian vegetation. The design provides a for a small channel within an adjacent flood plain. The typical bottom width of the flood plain is 30 feet while the base channel will be 8 feet wide and contain the low check dam with a four foot wide notched spillway. The design proposed eliminates check dam keys. These were not felt to be necessary for the design because they are surrounded with the channel filter blanket. Check dam keys are designed to anchor the structure and to retain flow within the channel preventing water from cutting around the structure. Cutting usually occurs once sediment is deposited behind the structure and water spills over the length of the dam. Should significant cutting of this nature occur design reconstruction may be necessary. This design considers site conditions and goals of reclamation and meets the regulatory requirements for design flow.

During reclamation the 4 inch pipeline from Sweets Pond to the minesite will be disconnected, the end of the pipes will be plugged and, the pipeline abandoned in place. The reclamation for this site should be performed in a timely manner since it is no longer proposed to be used.

Stream Buffer Zones.

At the time of reclamation the permittee will need to submit another stream

alteration permit. The permittee must receive approval for stream alteration before the reclamation construction can commence.

Sediment Control Measures.

The permittee stated the location of the pond and channel re-establishment makes it impractical to retain the pond through the entire reclamation period. If the permittee had designed the operational site to retain the pond, the culvert system could have been retained in the location of Jewkes Creek until Phase II bonding or until vegetation was adequate to control erosion. However, it may be best to establish flow through the riparian area, as soon as possible, in order to establish the riparian vegetation. Alternative methods proposed to be employed during reclamation included; Silt fences; Surface ripping, pocking, and deep gouging; Mulching; Straw-bale dikes.

Mechanical treatment of slopes with a grade of less than 10 percent will be completed by ripping the soil 18 inches deep with shanks placed at 7-foot intervals to achieve parallel slots 4 to 10 inches wide. These areas will be mulched. Additionally, in Section 3.5.4.2 the plan indicates the grading and placement of overburden and topsoil will be done along the contour, and in section 3.5.4.3, it is stated that slopes 2 ½ :1 or greater will be matted and all areas will be mulched during seeding.

Silt fences will be placed parallel to the contours with ends turned up perpendicular to the slope. Approximate locations are on plate 7-7. Installation will be completed according to Figure 7-9. Silt fences or strawbale dikes will be used in road ditches, and immediately downstream of the disturbed area. In addition, section 3.5.4.3 indicates silt fences will be established at the bottom of fill slopes and along the top bank of the reclamation channel.

Silt fences and straw-bale dikes will also be installed in road ditches immediately downstream from the disturbed area and are proposed to be used in the channels. The permittee provided the design provisions for fences installed in ditches or drainages with silt fences installed, silt fences installed in ditches have a notched spillway. These are current BTCA for proper installation of these structures in a ditch or channel.

The permittee states "If feasible, efforts will be made to minimize reclamation activities during periods of wet weather. During short periods when reclamation construction activities will be suspended, the construction site will be left in a condition which would minimize the impact on the hydrologic system if a precipitation event were to occur." An additional note states that depending on the season of the year and weather conditions the procedures may be completed as one operation or by area to control erosion and provide drainage. The time table and sequence will depend upon season of the year and precipitation

(section 3.5.4).

The following information and commitments were presented in the plan.

1. Backfilling, regrading, recontouring, fertilizing, seeding and mulching of the roads on both sides of Portal Canyon will occur following portal removal (section 3.5.4).
2. According to the Reclamation Time-table, table 3-4, the installation of sediment controls will be conducted while the reclamation channels are constructed. (According to this table this does not include roughening, seeding mulching or any other measures this conflicts with statements made in section 3.5.4 under 1 above).
3. Operational culverts will be removed as construction of the reclamation channel move down each canyon, section 3.5.4. Construction of the reclaimed stream channels and grading will commence at the upstream end of each channel/canyon working downstream (section 7.2.3.2, subtitle Sediment Control). No details were provided for the drainage where the culverts are remaining. It is assumed that disturbed drainage will be routed in ditches along the culvert or otherwise drain to the pond until sediment control measures are installed however, no details of this phase were provided.
4. A commitment to submit, for approval from the Division, the specifications for erosion control matting that will be used for reclamation as a BTCA measure and the commitment to install erosion control matting according to the manufacturer's directions are included in section 7.2.3.2, subtitle Sediment Control. Erosion Control matting and sediment controls will be placed throughout the reclamation process as they are needed (section 3.5.4). No sequencing plan to place matting, beyond the portal canyon roads, was presented. A description for what constitutes need was not provided.
5. Horizon committed to retain the sedimentation pond and UC-1 as long as possible, and has committed to provide BTCA at the time of reclamation (section 3.5.7.1, and section 7.2.3.2, subtitle Reclamation Hydrology Design). Prior to removal of the sedimentation pond during reclamation, UDOGM will be notified and given the opportunity to inspect and endorse the removal (section 3.5.7.1 and section 7.2.3.2).

Estimated erosion production for the proposed methods are compared with erosion production expected from the cover required to meet vegetative standards for reclamation. This paper exercise indicates that the erosion that would reach the stream is better during reclamation than that which would occur at bond release. Although these numbers suggest reasonable erosion control. The presented analyses does not compare the volume that would reach the stream if a sedimentation pond were used. The erosion presented compares a 10 year -6 hour event not, the 10 year- 24 hour event required to be treated by a sedimentation pond. The analysis assumes all sediment control measures are in place. While this may be true following implementation of all measures, it may not hold true during all phases of the construction period. However, site conditions such as the annual precipitation favor the potential for a relatively quick establishment of vegetation at this site.

Although the requirements of R645-301-763 state "Siltation structures will be maintained until removal is authorized by the Division and the disturbed area is stabilized and revegetated". BTCA measures have been granted by the Division in the past, in leu of a sedimentation pond for ephemeral systems, however, this is a perennial/intermittent system and has a higher risk of contributing excess sediment off-site.

The plan provides measures for alternate sediment control. Some of the sequencing in implementing these measures is not clear but, it is often difficult to determine these details in advance of reclamation. On site and pre- construction meetings with the division and the operator can clarify these issues. The approval of these measures should be re-assessed at the time of reclamation to assure the methods remain BTCA at the time of reclamation. Approval for removal of the sedimentation pond can be granted following site inspection of the alternate sediment control measures. It is believed that these additional measures will allow the applicant to provide BTCA and meet reclamation success as it was intended under the SMCRA.

The applicant will need to obtain a stormwater permit for this site. Additional monitoring may be required at the discretion of the Division depending on site specific determination of the erosional condition of the revegetated areas. A monitoring program should be developed which demonstrates that the effluent limitations set forth in R645-301-751 will be met as provided in 40 CFR part 434, and which demonstrates sediment contributions to the stream have been minimized.

Siltation Structures.

According to the agreement under Section 3-5, Sweets Pond will have a postmining land use as a private fishing pond. Mountain Coal Company would be responsible for liability until the reclamation bond is released from the Gordon Creek 2/7/8 mine. There after Horizon or the land owner must take responsibility for liabilities associated with the structure.

No sedimentation ponds, discharge structures, impoundments or other treatment facilities are proposed or approved for retention as a postmining land use.

Sedimentation Ponds.

The permittee stated the location of the pond and channel re-establishment makes it impractical to retain the pond through the entire reclamation period. In section 3.5.7.1 the plan states that the time table and sequence for removal of the sediment control structures will depend upon the season of the year and precipitation. Horizon committed to leave the sediment pond in place as long as possible.

Other Treatment Facilities.

No treatment facilities are proposed to be constructed at this site.

Exemptions for Siltation Structures.

No areas exempt from BTCA are proposed or granted for the applicable portions of the reclamation plan.

Discharge Structures.

The sedimentation pond and its associated discharge structure will be removed during the reclamation period.

Impoundments.

The only impoundment proposed at this site is the sedimentation pond, the reclamation of which is discussed under **Sedimentation ponds** above.

Casing and Sealing of Wells.

The final casing and sealing of wells is discussed in more detail under **MINE OPENINGS** above.

Findings:

The proposed amendment is considered adequate to meet the minimum requirements of this section. Although the requirements of R645-301-763 state "Siltation structures will be maintained until removal is authorized by the Division and the disturbed area is stabilized and revegetated". BTCA measures have been granted in lieu of a sedimentation pond

for ephemeral systems in the past. Although, this system flows for most of the year and contributes flow to a perennial stream, it may be best to establish flow through the riparian area, as soon as possible, in order to establish the riparian vegetation.

The approval of these measures as BTCA will need to be re-assessed at the time of reclamation. The approval for removal of the sedimentation pond can be granted following a site inspection of the BTCA conducted on site. The success of BTCA measures will be determined through performance standards and through site inspection and monitoring measures. It is believed that these measures will allow the applicant to provide BTCA and meet reclamation success as it was intended under the SMCRA.

Recommendation:

It is believed the applicant meets the intent of the regulatory requirements. However a few conflicts remain in the plan. It is recommended that the information provided to date be inserted into the plan and that the approval letter refer the applicant to the section of this T. A. under Reclamation Sediment Control Measures.



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

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
James W. Carter
Division Director

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801-359-3940 (Fax)
801-538-7223 (TDD)

July 11, 1997

Brad Bourquin, P.E.
1131 South Dover St.
Denver, Colorado 80232

Re: Response to Division Order 96A and Permit Stipulations, Horizon Coal Company,
Horizon Mine, ACT/007/020-97A & 97C, Folder #2, Carbon County, Utah

Dear Mr Bourquin:

The referenced amendments 97A & 97C are hereby approved effective July 11, 1997. A stamped approved incorporated copies is enclosed for insertion into your Mining and Reclamation Plan.

If you have any questions please call.

Sincerely,

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

Joseph C. Helfrich
Permit Supervisor

tt

Enclosure

cc: Ranvir Singh, OSM
Richard Manus, BLM
Alan Rabinoff, BLM, w/o
Mark Page, Water Rights, w/o
Dave Ariotti, Health, w/o
Bill Bates, DWR, w/o
Bill Malencik, DOGM

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

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801-538-7223 (TDD)

April 24, 1997

Brad Bourquin, P.E.
Horizon Coal
1131 South Dover Street
Lakewood, Colorado 80232

RE: Response to Division Order 96A and Permit Stipulations, Horizon Coal Company, Horizon Mine, ACT/007/020-97A & 97C, File #2, Carbon County, Utah


Dear Mr. Bourquin:

The referenced information was submitted to the Division's Price Field Office by Vicky Bailey on February 10, 1997. The submittal addressed three agency actions: Division Order 96A, Notice of Violation N-96-35-1-2 #2/2, and the special conditions to your permit approval of October 10, 1996. The response to the notice of violation has been approved under separate cover. Review comments addressing the Division Order and special conditions to the permit approval are outlined below. Your response by June 16, 1997 is required.

Division Order 96A

R645-301-333.300.

The permittee must provide a commitment in the MRP and construct all power line towers according to the guidelines outlined in *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*, Edison Electric Institute, Washington, D.C.

The permittee must provide a copy of the permit issued by Carbon County to construct the water pipe line from the Sweets Pond to the horizon facility.

The permittee must provide a written copy of landowner request to have the utilities remain after the mine has discontinued their use, i.e. Sweets Pond pump facilities, etc.

R645-301-411

The MRP fails to address the premining and current land use of the area associated with the water and power lines and the Sweets Pond area. The description of the area must also include classifications of the area under local law. The permittee should indicate whether or not the Sweets water truck fill up facility is going to remain and be used by Horizon or

indicate the possible need for another fill up facility.

R645-301-412

The permittee must address and discuss the postmining land use of the disturbed area associated with the water and power lines and the Sweets Pond area in the MRP. The postmining land-use section must also contain a copy of the surface or land owner comments regarding the proposed postmining land use.

R645-301-512

Plate 3-8 needs to be certified by a registered professional engineer.

R645-301-521.100

The following corrections should be made on plate 3-8.

- ▶ The power line is identified on the wrong side of the road from the substation to Sweets Pond. Illustrate the power line in the correct location.
- ▶ Show the power line location on Plate 3-8 to the north of the substation.
- ▶ Properly identify the disturbed area
- ▶ Illustrate where the power lines tie in to other lines, power poles, etc.
- ▶ The power system should depict in sufficient detail the existing facilities proposed lines and power poles.

Special Conditions to Permit Approval

R645-301-120

The permittee must provide accurate information on plate 7-1 and correct duplication of site labels and symbols to accurately reflect the type of site represented by the label.

R645-301-121.200

Resubmit Table 3-4 in a legible form.

R645-301-352

The temporary seed mixture must be changed to a permanent seed mixture when referring to contemporaneous revegetation. The permit change states that the temporary seed mixture will be used in contemporaneous revegetation. Contemporaneous revegetation is permanent revegetation performed during the operations phase of mining on land that will not be disturbed again. Interim revegetation is only temporary revegetation and stabilization on lands which will be disturbed during operational or reclamation activities.

R645-301-353

The permittee must present a reclaimed drainage through the Jewkes Creek area which will allow a reasonable likelihood of reestablishing the Riparian Wet Meadow vegetation which currently exists on site. At a minimum the Riparian Wet Meadow community must be of the extent as shown on the wet lands map in appendix 9-2. The permittee must meet the commitment made in the MRP to address this requirement, weather conditions permitting, by no later than June 16, 1997, as addressed in the letter dated April 8, 1997, to Daron Haddock from Brad Bourquin.

R645-301-731

The permittee must clarify the information presented on page 7-30 in this submittal to clearly present the proposed monitoring at CC-5 and MC-4. Additional parameters to be collected should include field monitoring parameters and TDS.

R645-301-731.121

The permittee must provide an oil skimming design for the sedimentation pond spillway.

R645-301-742

The permittee must correct the **reclamation time table** to show the intention to remove the sedimentation pond prior to completing regrading practices and provide a commitment in the plan to obtain approval from the division prior to removal of the sedimentation pond coordinated with an inspection to be completed by a division hydrologist. The permittee must also provide a detailed time table and plan for the construction activities to occur. This detail should include timing and sequencing of the following: removal of the culvert system; regrading, topsoil placement, mulching and erosion control matting for specific areas, phased drainage control for major stages of reclamation, a monitoring program with sampling set up on a continual basis at timed intervals to demonstrate that effluent limitations set forth in our 645-301-751 will be met as provided in 40CFR part 434 and which demonstrates sediment contributions to the stream has been minimized or; provide for retention of the sedimentation pond as required under R645-301-763.

The permittee must obtain an additional mine water discharge point for the UPDES permit, prior to discharge from the mine portal.

R645-301-742.240

The permittee must request an exemption from sediment control measures along the county road and provide necessary documentation and information to meet the requirements of this section.

R645-301-742.300

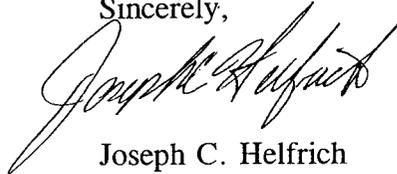
Response to DO96A & Permit Stipulations
ACT/007/020-97A & 97C
April 24, 1997
Page 4

The permittee must provide surface topography that is graded to drain to the channels especially as it relates to Portal Canyon.

R645-301-742.322

The permittee must demonstrate that the reclaimed intermittent and perennial channels can carry the flow capacity for the upstream and down stream channel sections.

Sincerely,



Joseph C. Helfrich
Permit Supervisor

tt

cc: Bill Malencik, PFO
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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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801-538-7223 (TDD)

March 4, 1997

Brad Bourquin, P.E.
1131 South Dover St.
Denver, Colorado 80232

Re: Division Order 96A, Horizon Coal Company, Horizon Mine, ACT/007/020-97A,
Folder #2, Carbon County, Utah

Dear Mr. Bourquin:

We have received the above-referenced amendment. Our agency anticipates approving this amendment by March 14, 1997. A copy is available for review at our Salt Lake and Price offices.

If you have any questions please call me 538-5290.

Sincerely,

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

Joseph C. Helfrich
Compliance Permit Supervisor

tat

cc: Ranvir Singh, OSM
Richard Manus, BLM
Alan Robinoff, BLM SLC
Robert Williams, UFWS
Mark Page, Water Rights
Dave Ariotti, Health Dept.
Bill Bates, DWR
PFO

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**Horizon Coal Corporation
P.O. Box 2560
Wise, VA 24273**

February 18, 1997

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

Subject: Submittal of Permit Changes on February 10, 1997
Permit No. ACT/007/020
Horizon Coal Corporation, Carbon County, Utah

Dear Daron,

This letter is to clarify the information submitted on February 10, 1997 to the Price UDOGM office. The information pertaining to Division Order 96A is located in Chapter 3, Pages 3-4 and 3-29, and Plate 3-8. Appendix 3-8 contains the plate showing where waste from previous mining operations is buried (Violation 96-35-1-2). Text concerning buried waste can be found on Page 3-13.

The remainder of the submittal pertains to "Attachment A, Special Conditions to Permit Approval" and current mine conditions.

If you have any questions please call Vicky Bailey at (801) 561-1555. Thank you for your assistance.

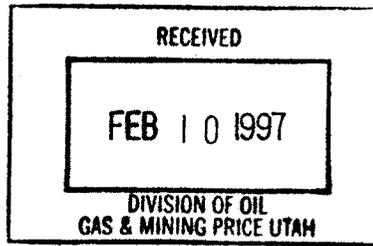
Sincerely yours,


Vicky S. Bailey

cc: Bradley J. Bourquin

February 10, 1997

Mr. William Malencik
Division of Oil, Gas and Mining
451 East 400 North
Price, Utah 84501



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

Subject: Horizon Coal Corporation response to "Attachment A, Special Conditions to Permit Approval", Division Order 96A, Violation 96-35-1-2 and updated data addressing current mine conditions.

Dear Bill,

Please find enclosed 6 copies of changes to the Horizon Coal Corporation permit. These changes cover a variety of issues as described in the "Subject Line" above.

Several changes to the permit were made because of our conversations concerning commitments contained within the permit document. The changes were in areas having to do with UDOGM enforcement jurisdiction and the responsibilities of various governments agencies to enforce the commitments described in the permit.

Duplications in the text were also eliminated, to prevent confusion in the future.

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

Sincerely yours,

Vicky S. Bailey

cc: Brad Bourquin

Post-it® Fax Note 7671		Date 2-10-97	# of pages 3
To Susan White	From Vicky Bailey.		
Co./Dept.	Co.		
Phone # Submittal 1	Phone # here at		
Fax #	Fax # PFO.		

02/07/97 08:45

FAX 801 561 1861

EARTHFAX ENG.

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Form DOGM - 01 (Last Revised 6/93)

File Fold # 3

APPLICATION FOR PERMIT CHANGE

Title of Change: Horizon Coal Corporation response to "Attachment A, Special Conditions to Permit Approval", Division Order 96A, Violation 96-35-1-2 and updated data addressing current mine conditions.

Permit Number: ACT 007/020

Mine: Horizon Mine

Permittee: Horizon Coal Corporation

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

- Yes No 1. Change in the size of the Permit Area? _____ acres increase decrease.
- Yes No 2. Change in the size of the Disturbed Area? _____ acres increase decrease.
- Yes No 3. Will permit change include operations outside the Cumulative Hydrologic Impact Area?
- Yes No 4. Will permit change include operations in hydrologic basins other than currently approved?
- Yes No 5. Does permit change result from cancellation, reduction or increase of insurance or reclamation bond?
- Yes No 6. Does permit change require or include public notice publication?
- Yes No 7. Permit change as a result of a Violation? Violation # 96-35-1-2
- Yes No 8. Permit change as a result of a Division Order? D.O.# 96A
- Yes No 9. Permit change as a result of other laws or regulations? Addresses "Special Conditions to Permit Approval"
- Yes No 10. Does permit change require or include ownership, control, right-of-entry, or compliance information?
- Yes No 11. Does the permit change affect the surface landowner or change the post mining land use?
- Yes No 12. Does permit change require or include collection and reporting of any baseline information?
- Yes No 13. Could the permit change have any effect on wildlife or vegetation outside the current disturbed area?
- Yes No 14. Does permit change require or include soil removal, storage or placement?
- Yes No 15. Does permit change require or include vegetation monitoring, removal or revegetation activities?
- Yes No 16. Does permit change require or include construction, modification, or removal of surface facilities?
- Yes No 17. Does permit change require or include water monitoring, sediment or drainage control measures?
- Yes No 18. Does permit change require or include certified designs, maps, or calculations?
- Yes No 19. Does permit change require or include underground design or mine sequence and timing?
- Yes No 20. Does permit change require or include subsidence control or monitoring?
- Yes No 21. Have reclamation costs for bonding been provided or revised for any change in the reclamation plan?
- Yes No 22. Is permit change within 100 feet of a public road or perennial stream or 500 feet of an occupied dwelling?
- Yes No 23. Is this permit change coal exploration activity inside outside of the permit area?

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Attach 6 complete copies of proposed permit change as it would be incorporated into the Reclamation Plan

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.

Bradley Bourquin 2/7/97
Signed - Name - Position - Date

Subscribed and sworn to before me this 7 day of Feb, 1997.
[Signature]
Notary Public

My Commission Expires: 4/18, 1998
Attest: STATE OF UTAH }
COUNTY OF [Signature] } sst

ASSIGNED PERMIT CHANGE NUMBER

1000

Application for Permit Change Detailed Schedule of Changes to the Permit

Title of Change: Horizon Coal Corporation response to "Attachment A, Special Conditions to Permit Approval", Division Order 96A, Violation 96-35-1-2 and updated data addressing current mine conditions.	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 1, Text, Table of contents
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 2, Pages 2-4 through 2-7
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 3, Text, Tables, Figures, Table of Contents
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Appendix 3-8 (3-1)
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Addendum to Appendix 3-5
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Plates 3-1, (and 3-4A) (3-7)
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Plate 3-8
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 4, Page 4-7
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 7, Text, Tables, Figures, Table of Contents
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Addendum to Appendix 7-2
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Appendix 7-4
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Plates 7-1, (7-4, 7-5, 7-6*
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 8, Pages 8-iii, 8-12, 8-20, 8-23 through 8-25
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Addendum to Appendix 8-1
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Plate 8-1
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 9, Pages 9-2 through 9-8
<input checked="" type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Addendum to Appendix 9-2
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 10, Pages 10-3 through 10-5, 10-37 through 10-39
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 11, Pages 11-1 and 11-2

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* Only a portion of Plate 7-6 has been submitted, the remainder of the plate has not changed. Upon approval of Detail 1, the entire plate will be submitted.

February 10, 1997



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

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
James W. Carter
Division Director

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P.O. Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340
(801) 359-3940 (Fax)

February 11, 1997

TO: Joe Helfrich, Permit Supervisor 

FROM: Wm. J. Malencik, Reclamation Specialist 

RE: Horizon Submittal/Division Order Et. Al., Horizon Coal Company, Horizon Mine, ACT/007/020 -97A, Folder #2, Carbon County, Utah

Have reviewed the submittal primarily as related to existing on the ground features and other items on the surface facilities map. Have not gone into those issues between Horizon Consultant and the technical staff that have been in the discussion stage for some time.

Surface Facilities Map

It would be helpful to show proposed surface facilities in a manner where they could be differentiated from existing facilities.

-Electrical Power

- 1) Power line is on the wrong side of the road, i.e., substation to Sweet's pond.
- 2) Power line ends on the disturbed area without any appropriate tie-in to other lines, power poles, etc.
- 3) It my recollection that a substation will be built on the mine disturbed area above to the UP&L substation.
- 4) In conclusion, the power system should be depicted in sufficient detail to show:
 - existing facilities
 - proposed lines, power poles



Page 2
J. Helfrich
Horizon - 97A
February 11, 1997

Format

- Some text duplication has been eliminated. This is indicated by line out.
- The pages are not numbered, but should be renumbered after the Division completes the review and approval.

Truck Water Fill-up Facilities

- Is the Sweet's truck water fill-up facility going to remain and be used by Horizon or is another fill-up facility going to be constructed?

sd
enclosures