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DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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January 28, 1992

Mr. Rick Olsen
Soldier Creek Coal Company
P. O. Box I
Price, Utah 84501

Dear Mr. Olsen:

Re: Technical Deficiency Review for Permit Renewal, Soldier Creek Coal Company, Soldier Canyon Mine, ACT/007/018, Folder #3, Carbon County, Utah

The technical review has been completed on your application for permit renewal for the Soldier Canyon Mine. As a result of the review, the Division has determined that there are a number of technical items that must still be addressed. These items are discussed in the attached technical review document. Please review it and provide a response as quickly as possible. Items not addressed will need to be stipulated in your permit renewal due February 3, 1992. We encourage you to avoid having stipulations if possible.

As you are aware this review does not cover your proposed waste rock disposal site or addition of new leases to your permit. That review will be conducted separately from the renewal process.

If you have any questions regarding any of these requirements, please don't hesitate to call.

Sincerely,

Daron R. Haddock
Permit Supervisor

Enclosure
cc: B-Team
TECHDEFI.SC3

Analysis:

Descriptions of the methodology used to collect and analyze the data are missing from portions of the plan. For example, the 1984 analyses presented on the substitute topsoil material is in a tabular form. The laboratory that performed the analyses is not listed. The raw data sheets are not provided. Even recent data is presented without a description of how soil samples were prepared in the field and laboratory, prior to analysis.

Furthermore, although the Applicant intends for the guidelines to be followed during analysis, discussions with the laboratory have indicated that other methods were used.

Deficiencies:

1. In Chapter 2 of the MRP, for each group of soil analyses, describe sample collection and preparation and supply citations for the methods of analysis used for sampling which has occurred in the last 5 years.

2. Provide the credentials of all contributors as they are mentioned in the MRP; i.e., Dr. A. R. Southard, Soil Scientist, U.S.U.

R645-301-221. Prime Farmland Investigation.

Proposal:

Page 2-2 of the MRP indicates that a Soil Conservation Service (SCS) prime farmland determination letter is found in Appendix 2-B.

Analysis:

A letter of determination for the refuse disposal site was found in Appendix 9B, "Wetlands."

No letter of determination was included with the MRP for the areas within the present permit boundary and added lease modifications.

A letter of determination for the topsoil storage site was viewed by the Division during review of a previous amendment to the present plan. At the time, the topsoil storage

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A letter of determination for the topsoil storage site was viewed by the Division during review of a previous amendment to the present plan. At the time, the topsoil storage

site was not determined to be prime farmland because it is upstream from the source of irrigation water (personal communication, Mr. Leland Sasser, SCS).

Deficiencies:

1. **Prior to approval**, letters of prime farmland determination must be included for the central mine facilities locality and other localized areas within the proposed life of mine, including but not limited to the Whitmore Park area, Nine Mile Canyon area, Pine Canyon area, Topsoil Storage Site.

R645-301-222. Soil Survey.

Proposal:

An order three soil survey of the permit area (derived from the SCS, Carbon County Soil Survey) is provided as Exhibit 2.22-1. An Order II soil survey map is referred to on pg. 2-16, but was not provided with the MRP.

Isolated portions of the central facilities area have been surveyed and mapped more intensely as the facilities have expanded. The results of these surveys are provided in Appendix 10 (Vol 5) for the Central facilities.

A description of the soils is accompanied by analyses of soil samples that have been taken over the years. These results are presented in Table 2.22-1, Table 2.22-2 for the Central Facilities site, and in Appendix 2-C (Vol 2) and Table 2.24-3 for the topsoil site.

Evaluation of "near-natural" (pg. 3-22) range conditions are regularly scheduled through observations and measurements of two reference areas adjacent to the central mine facilities (App. 3-A) and one reference area at the refuse disposal site (App. 3-B). The reference areas are located on Exhibits 3.7-1 and 3.7-2.

Analysis:

Immediately adjacent to Soldier Creek, surveys of the site present a picture of deep alluvial soils at elevations between 6710' and 6740', which supported deciduous streambank vegetation prior to disturbance. The combined "A" horizons are as deep or deeper than four

feet.

The "A" horizons become progressively shallower up the slope. On intermediate slopes (6740 to 6770') topsoil of the "A" horizon is approximately 14" in the Datino soil and 7" in Guben soil. Above the portals, the "A" horizon is 4 inches deep, the "C" horizon is 15" and rock is found below 19 inches or so. The undisturbed slopes are covered with mountain brush communities which give way to stands of firs and pines up-slope.

"B" horizons have developed on the intermediate slopes. They are located below the "A" horizon to a depth of 54" in Guben soils and to 75" in Datino soils. Carbonate accumulation begins to occur in the lower half of the "B" horizon.

The results of two studies indicate that there is a good source of topsoil to be salvaged during the construction of the silos and processing facilities. The soils are on the northwest side of the County Road adjacent to the storage yard and portal.

The SCS evaluated the soils on 5/23/91 and provided a narrative with the accompanying field sheet in illustration 10.6.3-1. This study indicates that Datino soils, Cumullic Haplustolls (C & D) and Guben soils have developed on the slope of the colluvium. The Cumullic Haplustolls have approximately 41" of "A" horizon topsoil. The Datino and Guben "A" and "B" horizons should both be salvaged to a depth of 26".

Earthfax sampled and surveyed the potential disturbance on 5/1/91. The acreage and topsoil salvage depth estimates are presented in illustration 10.2.12-1. Three Areas are sectioned out of the proposed disturbance. Unfortunately, there were no samples taken in Area 3 and samples of Area 2 were taken only above elevation 6740'. Earthfax estimates that Areas 2 & 3 will provide an average topsoil recovery of 14.5 inches. (The borderline sample between Area 1 and Area 3 at elevation 6762 was 21 inches deep.)

The topsoil estimates that were provided by Earthfax for Areas 2 and 3 are probably low. Using all the information provided in both surveys, one expects that below elevation 6762' in Area 3 to yield between 21 and 26" of topsoil and below elevation 6750' in Area 2 to also yield approximately 21" of topsoil. The total acreage that is covered by Areas 2 and 3 is one acre. The Applicant has emphasized that this is a "potential" disturbance, which will occur only if specified boundaries are exceeded during construction activity. The Division reminds the Applicant of the commitment made on pg. 2-35 of the plan concerning R645-301-232.600, Timing:

All material to be removed under R645-301-232 will be removed after the vegetative cover that would interfere with its salvage is cleared from the area to be disturbed, but before any drilling, blasting, mining, or other surface disturbance takes place.

A very limited survey of the 4.5 acre Topsoil Storage Site was presented (pg. 2.11, Section 2.22). The soil is a member of the Hernandez series. It is classified as a fine-loamy, mixed, mesic Ustollic Calciorthid with 4% slope. It is deep and well drained with good water holding capacity. Potential productivity for this upland loam range site is 1100 air-dry lbs/ac, without irrigation. The area was a sagebrush/grass community with approximately 35% cover prior to disturbance.

Finally, information regarding Fan #3 exploration is not presented in the narrative, Table 2-22.2 or Appendix 10.

Due to the pre-SMCRA disturbances at the site, there has been a paucity of information concerning the natural soil environment in Soldier Creek Coal Company's plan. Recent expansions and resulting amendments to the permit, have begun to provide information on the soil quality and quantity adjacent to the pre-SMCRA disturbance. The available information has been presented in site-specific maps which approximate an Order 1 survey map for the recently disturbed areas. The Division will continue to require soil sampling of areas prior to disturbance, both for quality and quantity of material, so that an Order 1 survey map for newly disturbed areas surrounding and adjacent to the mine site can be developed.

Deficiencies:

1. Include information in Appendix 10 regarding the Fan #3 exploration soils data gathered by the SCS. Include the volumes of topsoil stored at the Topsoil Storage site from the Fan #3 exploration.

2. Mention in the narrative on pg. 2-3, Soil Survey, that the location of the soil samples taken of the topdressing is on Figure 3.7-2. These samples are summarized in Table 2.22-2

3. A commitment is required in the MRP that the development plans for future disturbance (adjacent or distant from the central mine site) will include depth segregated soil sampling which will be logged in the field according to the National Cooperative Soil Survey and analyzed by horizon according to Table 1 of the Division's "Guidelines" for topsoil.

Methodologies of the labs will be made available to the Division with the laboratory analysis sheets.

4. An Order 1 soil survey map of the surface disturbed mine facilities area must be prepared before construction of Fan #3. This map will consolidate the information provided in Appendix 10 (Vol. 5) and Chapter 2, and Fan #3 exploration. Locations of all previous sample pits and auger holes, and dates of sampling will be provided on the map. The map must show all soil types from available information. Areas disturbed prior to ?August 1977 will be delineated.

R645-301-222.400. Present and Potential Productivity of Existing Soils.

Proposal:

The productivity of several range locations (including the reference areas) within the permit area were evaluated by the SCS on 10/30/90 and 10/7/91 and presented in Appendix 3-C (Vol. 3).

Analysis:

Productivity at the site is "fair" (2500 lbs/ac) for the riparian reference area, which may have been devastated by a flood this year. A "good" (1800 lbs/ac) rating was estimated for the (steep) Mountain Brush site as per SCS document 10/7/91. Pg. 3-22 of Vol 1 indicates that there are four reference areas. There is no reference to a map(s) for the reference area locations for the central mine facilities and refuse disposal site. In addition, referring to the Appendices 3-A and 3-B, one finds only three reference areas described: two for the mine site and one for the refuse area. A map is refereed to in Appendix 3-B, on pg. 5 of the 1990 Mt. Nebo Scientific Report. No map was found with the report.

Deficiencies:

1. Clarify the number of reference areas and mention on pg. 3-22 and pg. 5 of App. 3-B the figures which show location of vegetation reference areas.

2. Provide the map which is refereed to on pg. 5 (App. 3-B, Vol. 2 of the

1990 Mt. Nebo Scientific Vegetation Analysis Report.

R645-301-234. Topsoil Storage.

Proposal:

The topsoil storage yard, 2.5 miles south of the mine site, holds 2,310 yd^3 of topsoil and 3,794 yd^3 of substitute topsoil (for further information refer to Section 2.31.4, pg. 2-31). The topsoil harvested from Fan #2 development amounted to 660 yd^3 and is stored in a lift at the south side of the REI storage yard. Also, undisturbed sediment pond soils as described on pg. 2-3 & 4, 2-19 & 20, 2-22 through 2-27, have been designated for use as topsoil during reclamation. These soils are stored 'in situ', but have not been labeled on a map or at the site.

The Applicant commits on pg.2-32 of Vol. 1 of the plan to protect the topsoil and substitute topsoil during operations. And on pg. 2-24 & 2-27, the MRP clearly states that the use of soil material as backfill negates its potential for use as substitute topsoil. While on pg. 2-32, there is a description of the storage of topsoil material in a gravel capped storage pad, the exposed face of which was seeded and mulched. The plan further describes the storage of substitute topsoil in operations pads: upper storage yard, crib wall, Fan #2.

Analysis:

The topsoil storage facilities located a distance from the mine site will provide a good measure of protection for the soils salvaged in 1990 and 1991. The soils were seeded and mulched in the Fall of 1991. The development of cover will be monitored in 1992.

Other topsoil is located at the central facilities. Some salvaged topsoil (310 yd^3) from Fan #2 development (referred to on pg. 2-22, Section 2-24 and pg. 2-24, Section 2-24) is stockpiled on the southern portion of the sediment pond. A topsoil sign identifies this material on site. However, the much larger topsoil pile which it abuts is labeled REI storage yard on the central facilities map, 5.21-1. Also, undisturbed sediment pond soils, as described on pg. 2-3 & 4, 2-19 & 20, 2-22 through 2-27, have been designated for use as topsoil during reclamation. These soils have not been labeled on a map or in the field.

Substitute topsoil storage as described in the plan raises the question of the intent of R645-301-232.200.

R645-301-232.200. *Where the topsoil is of insufficient quantity or poor quality for sustaining vegetation, the materials approved by the Division in accordance with R645-301-233.100 will be removed as a separate layer from the area to be disturbed, and segregated.*

The designated substitute topsoil will, in most cases, be a suitable growth medium. The main difficulty in establishing these areas as substitute topsoil is the subsequent treatment that the soil has received. The topsoil has been stored in operations pads and is not being protected or segregated from the area to be disturbed. This condition has persisted at the mine site for years.

The Division will continue to allow the storage of designated substitute topsoil and topsoil material in operation pads, with the following contingency plan.

A. The Central Facilities Mine Map 5.21-1 must indicate all areas of designated substitute topsoil.

B. The material must be sampled at the time of final reclamation to confirm that it is the best available material in the permit area. At a minimum 3 depth segregated samples for each storage location will be required. (Samples from 0-12", 12-24", 24-36", and 36-48" depths.) Once it is sampled the soil must be isolated, protected, and marked for use as a substitute topsoil for the pre-SMCRA disturbances portrayed on Exhibit 2.22-2.

C. The soil will benefit from additions of organic matter to inject microbial life into the rhizosphere of the sterile growth medium that has been stored for so long in operational pads. The Applicant will develop test plots utilizing a variety of organic amendments and subsoil from the refuse site as growth medium. The parameters to be evaluated will include the microbiological activity in each test plot as correlated with plant growth and survival.

Deficiencies:

1. Locate all the designated substitute topsoil and all the topsoil storage areas on Central Mine Facilities Map 5.21-1 of the MRP.

2. Amend the MRP to state that the pre-SMCRA surface will be covered with the best substitute topsoil material in the permit area as determined by testing of depth segregated samples for total and nitrate nitrogen,

phosphorus, potassium, and total petroleum hydrocarbons, SAR, electrical conductivity, pH, percentage rock fragments, organic carbon, boron and selenium at the time of final reclamation.

3. Amend the plan to state that organic matter such as composted manure, digested sewage sludge, composted sawmill waste or other available material will be incorporated into the substitute topsoil upon reclamation to inject microbial activity into the rhizosphere. Methodology to be used will be based upon the test plots developed at the permanent topsoil storage site, using subsoil excavated from the refuse disposal site.

R645-301-224. Substitute Topsoil.

Proposal:

Substitute topsoil gathered from the stream channel disturbance in 1990 & 1991 was analyzed (Table 2.24.2) and has been stored and seeded at the topsoil storage site. This revegetation is referred to as a test plot on pg. 2-24, Section 2-24.

A good portion of the disturbed area at the central mine facilities site is pre-SMCRA disturbance (Exhibit 2.22-2). In 1984, SC3 evaluated much of the pad fill for use as substitute topsoil material during final reclamation (pg. 2-19, Table 2.22-1, Figure 3.7-2 and pg. 5-68).

Test plots have been constructed "to test the efficacy of the substitute topsoil for reclamation," pg. 2-22, Section 2-24. These test plots are mentioned throughout chapter 2. These plots are located at the sewage lagoon, adjacent to Fan #2, on the topsoil stockpile, and behind the crib wall (see pgs. 2-24 and 2-26 of Section 2.24). Information on test plot evaluations is provided in the MRP, Section 3.42.25, pg. 3-28, the crib wall test plot has been left out of these evaluations however.

Analysis:

The suitability of the test plot locations to determine the effectiveness of the material held in a pad for decades is questionable. Three plots were located on newly disturbed soil. The plot laid-out behind the crib wall would be of value in determining the suitability of the

disturbed soil for reclamation, but it could not be found on any map or in Section 3.42.25. (Finally, one of these topsoil test plots was destroyed when the material was carried down to the permanent topsoil storage location in 1991.)

The areas presently designated as substitute topsoil are located under the asphalt surface of the parking lot (PKL), in the upper storage yard (USY), in the pad behind the crib wall (CW), in Fan #2 (F#2) pad, in the Sediment pond embankments (SED), an undisturbed sediment pond soils (UD) as described on pg. 2-3 & 4, 2-19 & 20, 2-22 through 2-27. The table below summarizes the information in the MRP regarding volumes of subsoil estimated to be available.

Location		Yardage
PKL	approximately 9, 800 yd^3 X 40% fine grained =	3,920 yd^3
USY	n/a	
CW	n/a	
F#2	n/a	
SED	1,862 yd^3 - 600 yd^3 overburden =	1,262 yd^3
	(material from SED is reported on pg. 5-68 to be 4,500 yd^3)	
UD	"A" + "B" = 1,238 yd^3 + "C" =	3,328 yd^3

The MRP must present a plan for resampling this soil during final reclamation. See discussion under R645-301-234. A plan for harvesting and isolating the material (from the rest of the backfill operations) at the time of final reclamation is also required.

Two contradictory statements are made concerning the sampling and segregation of soils. On pg. 2-19 the location of sample #2 indicates that the fill material used to create the storage pad and sediment pond embankments is planned for use as a substitute soil. On pg. 2-32, the storage yard on the southeast portion of the sediment pond is described as a topsoil storage site.

Deficiencies:

1. Provide a description in Section 2-24 for location of the crib wall test plot, a description of the treatments employed on this plot, and the evaluations of the plot to date.

2. Include the crib wall test plot on the Central Mine Facilities Map 5.21-1.

3. Clarify the description of the location of soil sample #2 (pg.2-19 of Vol 1 of the MRP) and the storage location of the soils represented by sample #2 (pg. 2-32 of vol 1 of the MRP).

4. Clarify the yardage of all substitute topsoil presently stored in fills by completion of the table presented in this technical analysis under this rule.

5. Present a commitment in the MRP to resample all designated substitute topsoil locations prior to final reclamation, refer to the deficiencies under R645-301-234 for specifics.

6. Present a plan for isolating and protecting the substitute topsoil during the backfilling and grading of final reclamation.

R645-301-230. Operation Plan.

Proposal:

Areas of substitute topsoil have been designated. The material is part of the operations pad. The operations plan for topsoil salvage and storage including equipment is provided on pg. 2-31, Section 2-31; pg. 2-39, Section 2.34; and Plate 5.21-1.

An undefined amount of topsoil is located in the REI storage yard (pg. 2-32, Section 2.31.4). The MRP indicates that this area is well marked and protected by a gravel cap and a fence.

Salvaged topsoil and substitute topsoil is stored in the topsoil storage site approximately two miles south of the main mine facilities. Seeding and mulching of this soil is described in Chapter 3, pg. 3-7, Section 3.31 and Section 3.41.22, pg. 3-16. Volumes of topsoil stored at the site are found on pg. 2.34, Section 2.32. There is 2,310 yd^3 of topsoil and 3,794 yd^3 of substitute topsoil. Topsoil salvaged from the development of Fan #3 has not been included in the yardage.

Analysis:

No cross-sections of the topsoil piles stored at the topsoil storage site were presented, but volumes of piles are indicated on Plate 5.21.2. In addition to the 6,104 yd^3 at the topsoil storage site, the MRP specifies that 310 yd^3 of topsoil are located at the southern end of the sediment pond.

The topsoil handled at the topsoil storage site is well described in the plan. Approximately 6,104 yd^3 of topsoil and substitute topsoil has been segregated and protected at the topsoil storage site. Berms at the site were constructed of topsoil and have been reseeded. The access roadway has been ripped and reseeded along with the piles of topsoil and substitute topsoil. Methods of preparing the topsoil storage site area are presented in Sections 2.31 and 2.34, and 3.41-22. The site was seeded and mulched in the fall of 1991.

The topsoil remaining at the mine site is all in the same general location. Three descriptions are employed throughout the narrative:

1) Salvage of topsoil from main mine construction, placed in a pad, protected with a gravel cap and fenced;

2) Fan #2 topsoil, approx. 310 yd^3, (50'x30'x6');

3) Undisturbed topsoil and subsoil on the slope adjacent to the sediment pond.

Division inspectors have viewed signs on a single small topsoil pile on the southeast slope of the REI pad. This is also the location of a test plot.

Deficiencies:

1. All topsoil storage locations at the mine site must be specified on Map 5.21-1, Central Mine Facilities Map, estimate total and individual yardage.

2. The method of determining volumes of material must be stated, since cross-section of all topsoil piles and substitute topsoil piles which are stored at the topsoil storage site were not included with the MRP.

3. Include the yardage of topsoil salvaged from Fan #3 exploration site.

4. State definitively in the MRP that berms at the topsoil storage site are constructed of topsoil and that the road accessway has not been stripped of topsoil.

R645-301-232.200. Where the topsoil is of insufficient quantity or poor quality for sustaining vegetation, the materials approved by the Division in accordance with R645-301-233.100 will be removed as a separate layer from the area to be disturbed, and segregated.

Proposal:

Recent disturbances produced enough topsoil to cover the 2.16 acres of disturbance with one foot of cover providing an excess of 2,619 yd^3.

Stored substitute soil material in active surface facilities areas of the mine is of an unspecified volume. These substitute materials are suitable for growth medium, but have not been selectively removed or protected. They were sampled 'in situ' after their use in the pad was established.

Present plans call for the placement of one foot of topsoil over the post-SMCRA disturbance, leaving only 3.5" for coverage over the pre-SMCRA disturbance (pg. 5-68).

Analysis:

Approximately 10 acres (Ex 2.22-2 and pg. 5-68, Section 5.41) of the 14.6 acres represented on Map 5.42a at the central main site is pre-SMCRA. Post-SMCRA areas are presently 4.3 acres, not including Fan #3 (pg. 5-68).

Plans to cover the area with only one foot of topsoil will require thorough testing of the regraded fill for acid/toxic material. Some locations at the site may require two feet of cover over non-toxic, non-acidic refuse or mine waste. Coverage of only 3.5" is not acceptable.

For this reason the Division will not dismiss any topsoil from salvage during future

expansion and construction.

The Applicant is in compliance at present.

R645-301-242. Soil Redistribution.

Proposal:

Unsuitable material will be placed at low levels against the highwalls. Fill will be placed in the most efficient manner against the highwall (pg. 5-69). The fill will be scarified to a depth of 1.5 feet and staked on 100 foot centers (pg. 2-40, Section 2.42). Topsoil will be replaced to a uniform depth (pg. 2.41, Section 2.42). Page 5-68 indicates that 3.5" of topsoil or substitute will be placed over the 10.3 acres pre-SMCRA disturbance and one foot over the 4.3 acre post-SMCRA disturbance.

Analysis:

A soil recovery map is refereed to on pg. 5-45 and 5-46. What number map is this? Exhibit 7.60-1 and 5.42-1 were referenced but not found. Exhibit 760a shows reclamation contours and Exhibit 5.42a shows volumes of soil. Topsoil replacement depths are found in Section 5.42.

No definitive plan for protection and isolation of the substitute topsoil resource (during the backfilling and grading operations of reclamation) has been outlined. The calculations of fill do not seem to take substitutes into account.

Deficiencies:

1. Differentiate between the substitute topsoil and backfill from each location on the reclamation volumes Map 5.42a.

2. Identify the soil recovery map refereed to on pg. 5-45 and 5-46 by the exhibit number.

3. Describe the method of sampling which will enable determination of unsuitable material which will be placed against the highwall. i.e., frequency of sampling, the depths of sampling, the analyses to

be performed, etc. Will the sampling, as described in Deficiency #3 of R645-301-234, be conducted?

R645-301-321. Vegetation Information

Proposal:

Species composition, percent cover, productivity, woody plant density, and range condition data are presented for four reference areas, the mountain brush, deciduous streambank, pinyon-juniper, and sage-grass-juniper. Other vegetative communities, including sagebrush, Douglas fir, mixed conifer-mountain brush, and mixed conifer, were sampled less intensively. Carrying capacities of most of the communities based on productivity and proportions of utilization are included and are useful as baseline information for the land use section, also.

Appendix 10 Illustrations 10.7.1-1 and 10.7.1-2 contain vegetation surveys of the intake and portal development areas and of the county road realignment.

Analysis:

Sampling of the vegetative communities has been adequate to establish the baseline information requirements. There are some problems with data presentation, however, and there is also a discrepancy in the size of sampling plot which could affect some of the calculations.

Illustrations 10.7.1-1 and 10.7.1-2 contain vegetation information but are not discussed in Chapter 3.

There are numerous references throughout Appendix 3A to the waste rock disposal site. This is confusing because the site referred to is no longer proposed but sounds like the refuse disposal site being proposed in this application. A blanket statement at the beginning of this section to explain this would be very helpful.

Tables 3.7-1 through 3.7-5 and other tables use scientific name abbreviations. While these abbreviations are commonly used, they are not universal and an index must be provided. The Forest Service has a handbook containing these codes.

Illustration 3-1 includes three tables that have designations that overlap with tables in the appendix. These designations 3.7-9, 3.7-10, and 3.7-11 could just be eliminated in this illustration.

The data presented in Table 3.7-11 on the deciduous streambank reference area may have some problems that will need to be corrected later. Ilex sp. is listed as occurring in the reference area, but A Utah Flora states that this species is only known from cultivation in Utah. It is more likely that this plant is instead Mahonia repens, Oregon grape. Also, "Poan", which I assume to be Populus angustifolia, peach leaf cottonwood, is shown as occurring at the rate of 0.464 stems$\cdot m^{-2}$. This rate would be unusual for this species though not impossible. The species may instead be Salix exigua, streambank willow. Determination of the need for reevaluating this reference area will be made in the 1992 growing season when the plants are more identifiable.

Deficiencies:

1. Illustrations 10.7.1-1 and 10.7.1-2 must be discussed in Chapter 3.

2. Appendix 3A must include a statement to clarify the difference between the waste rock disposal area and the refuse disposal area.

3. An index must be provided to identify the scientific name abbreviations used in vegetation study tables.

4. Table designations 3.7-9, 3.7-10, and 3.7-11 must not overlap between different tables.

R645-301-322. Fish and Wildlife Information

Proposal:

The application presents a compilation of several wildlife studies. The area near the sewage lagoons, topsoil stockpiles, and proposed refuse disposal site is deer winter range and thus represents crucial/critical habitat for this species. Numerous raptor nests, including a few of golden eagles, are identified. Only a few non-game fish may inhabit Soldier Creek

during some years.

There are no animal or plant species classified as threatened or endangered that are known to be in the area. Machaeranthera leucanthemifolia is present and is classed as a 3C plant species and thus not considered to be under consideration for threatened or endangered status. Hedysarum occidentale var. canone is a sensitive species and is within the permit area.

Analysis:

In this section, like in the vegetation information section, the waste rock disposal area that is no longer proposed is occasionally discussed. This should be clarified so the reader can understand that it does not refer to the proposed refuse disposal site. On page 3-210 of Appendix 3D, there is a reference to Exhibit 4.1-2 which is apparently of the waste rock disposal site. This exhibit probably does not apply to this application, and I was unable to locate it.

The survey for western bluebird and Williamson's sapsucker habitat found potential nesting sites, but it was performed in the fall when no birds were present. The passerine bird survey did not include habitat suitable for these species. The Division of Wildlife Resources (DWR) was consulted regarding the necessity of performing this work in the spring when nesting birds would be present. They stated that there are other species that they are more concerned about and that are more likely to be present in the permit area, particularly the three-toed woodpecker, a sensitive species.

Correspondence from the DWR in the plan indicates that they know of several golden eagle nests in the cliffs above the mine office. These are not identified in the plan. This and other DWR correspondence identify measures to minimize effects of subsidence on raptors.

Plate R-1, which accompanies the Environmental Industrial Services Raptor Survey in Appendix 3D1, shows an area outside the permit area as having been surveyed for raptors. Figure 1, which shows the same surveyed area in more detail, is within the permit area.

Machaeranthera leucanthemifolia has now been classified as a variety of M. canescens and is no longer considered a category 3C plant. The application correctly identifies the presence of Hedysarum occidentale var. canone. Another sensitive species, Cryptantha creutzfeldtii, has been found in the area near the sewage lagoons. Bob Thompson of the Forest Service plans to do further survey work on this species during 1992.

Deficiencies:

1. Appendix 3D must contain an explanation of the difference between the waste rock disposal and refuse disposal areas. The reference to Exhibit 4.1-2 needs to be eliminated unless the exhibit is included.

2. Further survey work to confirm the presence or absence of western bluebirds, Williamson's sapsuckers, and three-toed woodpeckers needs to be performed. Since this work needs to be done in the spring, it is not possible for Soldier Creek to incorporate the results in the plan before permit renewal, but the work must be performed at the first opportunity.

3. Information on golden eagle nests in the cliffs above the mine office is readily available and must be incorporated in the plan.

4. The discrepancy between Plate R-1 and Figure 1 in the maps in the Environmental Industrial Services report, Appendix 3D1, needs to be corrected. Also, Plate R-1 should be more legible.

5. The current status of Machaeranthera leucanthemifolia as a non-candidate for threatened or endangered species status must be shown. Reference to this plant may be eliminated from the plan altogether. The presence of Cryptantha creutzfeldtii in the permit area must be identified; however, new information from the survey work that is planned for next year may need to be included later.

R645-301-323. Maps and Aerial Photographs

Proposal:

The application includes maps of the vegetative types, including reference areas, and of wildlife habitat within the area. No fish and wildlife monitoring stations are proposed. No specific wildlife enhancement or protection facilities are proposed, but the application states that fencing and power lines will be constructed according to DWR standards. The

landscape boulders/riprap stored at the topsoil storage site will provide shelter for smaller mammals.

Analysis:

Information on golden eagle nests obtained from DWR (see Fish and Wildlife section above) needs to be included on the appropriate maps.

Deficiencies:

1. The map showing raptor nests needs to include information from DWR on golden eagle nests in the cliffs above the main mine offices.

R645-301-330. Operation Plan

Proposal:

The area to be disturbed will be minimized through prompt establishment of interim or permanent vegetation. An intermediate seed mixture is shown. Revegetation methods will be the same as for permanent vegetation establishment. Different methods are shown for hand preparation and seeding of small areas.

Impacts on renewable resources from subsidence are discussed in Section 5.25 of the application. No timber products, other than perhaps firewood or fenceposts,are harvested from the area that could be affected by subsidence. There is no agriculture other than livestock grazing, and the application states that there should be no effect on grazing.

The application contains several measures to be used to minimize adverse effects on wildlife. Some rock and woody vegetation will be cleared and stockpiled before clearing topsoil in order to provide habitat for small mammals and upland game. Timing of major disturbances will avoid certain critical times. An education program will be conducted in association with the MSHA training to minimize the potential impact of employees on wildlife. Any threatened or endangered species discovered will be reported. Soldier Creek will request that power lines are constructed in accordance with current technology to avoid problems with raptor electrocution. Road locations have been assessed so they will have minimal impacts on wildlife, and the Applicant has committed to appropriate mitigation if

there is undue mortality to wildlife. Certain regulation of unauthorized people and companion animals is proposed, and harassment of wildlife will be discouraged. The use of pesticides will be carefully regulated and approved by the regulatory authority.

Illustrations 10.2.8-1 and 10.2.8-2 contain letters from DWR concerning mitigation for disturbances on deer winter range in the areas of the sewage lagoons, the topsoil storage site, and the waste rock disposal site. The second letter commends Soldier Creek for its payment of $4,752 for mitigation for loss of these sites. The index to Appendix 10 shows these letters as being Illustrations 10.8.2-1 and 10.8.2-2.

Analysis:

The methods proposed for interim revegetation should be adequate for establishing vegetation on these sites. No monitoring or remedial measures are proposed, however, in case efforts fail to provide cover needed for erosion control.

While impacts from subsidence on renewable resources would likely be minimal, the Applicant must commit to compensate for livestock that might be killed or injured as a result. Subsidence-caused surface cracks, which are of a size or nature to cause injury or death to livestock or wildlife, need to be repaired.

The commitments made to protect and enhance wildlife and wildlife habitat are good and address most concerns. Impacts to wildlife and wildlife values are also possible from subsidence and other mining effects. All seeps and springs are considered to be crucial/critical for wildlife. The loss of a golden eagle nest through the effects of subsidence is considered to be a form of taking the nest and possibly eggs and young. The loss of any raptor nest is not allowed without a permit. Correspondence from DWR in Appendix 3D1 identifies monitoring requirements for raptors.

DWR may have recommendations or requirements on ways to avoid impacts to wildlife, particularly through proper timing of operations, at the proposed refuse disposal site.

The letters from DWR that discuss mitigation for disturbances on deer winter range in the areas of the sewage lagoons, the topsoil storage site, and the waste rock disposal site are not referenced in Chapter 3 of the plan. The payment which Soldier Creek made to DWR for mitigation for loss of critical deer habitat included compensation for loss of 20.2 acres of shrub-grass-juniper habitat which are no longer intended to be disturbed. The proposed

refuse disposal area would also disturb critical habitat for deer; however, the area to be disturbed at any one time will only be 4-8 acres. DWR is evaluating the proposal to determine if further mitigation will be necessary. Also, the index for Appendix 10 or the designations of these letters must be corrected so that they match.

Deficiencies:

1. The application must include a program to qualitatively monitor all interim reclamation sites for revegetation success for at least the first two years following revegetation. The Applicant should also specify at what point remedial measures will be taken.

2. The Applicant must commit to compensating for livestock that might be killed or injured as a result of subsidence. Also, subsidence-caused surface cracks, which are of a size or nature to cause injury or death to livestock or wildlife, must be repaired.

3. Soldier Creek must commit to following the monitoring and operation program suggested in correspondence from DWR, contained in Appendix 3D1, for subsidence effects on raptors both for the expansion proposed at the time of the correspondence and for other areas.

4. The critical deer winter range mitigation, which Soldier Creek performed in 1989, must be referenced in Chapter 3 of the plan. Soldier Creek will need to follow DWR's recommendations on any further mitigation that is necessary to compensate for the temporary loss of the refuse disposal area as deer winter range. The index to Appendix 10 or the designation of the letters from DWR must be corrected so that they match.

R645-301-341. Reclamation Plan: Revegetation

Proposal:

The application goes into some detail on quality specifications for plant, seed,

fertilizer, mulch, and other materials that will be used for revegetation. Five different seed mixes are shown, and there is also a planting list of seedlings and cuttings that will be used in the riparian area. Revegetation will begin for each site component in the fall planting season following component closure, and all seeding will be completed in the fall.

The application also contains a lot of detail on soil preparation and planting methods. Graded areas will be ripped, topsoiled, and fertilized according to recommendations based on soil tests. The area will be disced then seeded either with a rangeland drill, if available, or a broadcast seeder. Straw or hay will be applied at 2 tons per acre and crimped. Some variations to these methods will be used for areas with steep slopes.

The riparian area will be revegetated according to the methods proposed for steep slope areas, but it will be supplemented with the planting of seedlings and cuttings. These will be planted in the early spring.

Specific standards for success are discussed in this section. Parameters to be sampled are productivity, cover, density, and species composition. The first three of these will be sampled adequately, according to $nm = (s^2t^2)/(d\bar{x})^2$, for statistical tests. The application shows the formulas for calculation of the 't' statistic which will be used in a two-tailed test at the alpha = 0.05 level. The Applicant proposes to evaluate species composition and diversity subjectively and to compare these parameters based on reference area species diversity, the seed mixtures used, and the post-mining land use. All of the reclaimed areas will be compared to appropriate reference areas which have been maintained in fair or better range condition to determine if revegetation has been successful.

The reference area proposed for use for the refuse disposal area is a pinyon-juniper community. The application states that this is likely to be the type that will establish on this site since the hollow, which will contain the refuse disposal site, will be raised in elevation to match surrounding pinyon-juniper sites.

The application proposes a program of strictly controlled livestock introduction into revegetated areas. It is anticipated that this will begin some time between 3 and 8 years after initial seeding.

Qualitative monitoring of all reclaimed areas will be performed the first year. Transplants and cuttings will be monitored quantitatively the first year and in years 2, 3, and 5. Quantitative monitoring to determine if remedial action is necessary on seeded areas is proposed for years 2, 3, and 5. Quantitative sampling will be performed in years 9 and 10

to determine success for bond release.

Field trials have been established at three sites. All of these contained at least one introduced grass and two introduced forb species. These trials are being monitored every five years.

Analysis:

Several of the items covered under this section would best be discussed under R645-301-356, Standards for Success. However, since the Applicant has chosen to address them under R645-301-341.250, Measures Proposed to be Used to Determine the Success of Revegetation, they will be considered here.

The materials specifications shown should help to ensure good probability of reclamation success. Hay and straw can be a source of noxious weed seed introduction, and the best way currently available to obtain mulch with the least chance of containing these seeds is to buy certified noxious weed free straw or hay. Seed packaged and labeled according to the stipulations shown in the plan should be of good quality except that no provision is made for the age of the seed. According to the Utah Seed Act, seed of flowers, trees, and shrubs must have been tested within the nine months prior to sale. All other seed must have been tested within the previous eighteen months. Any seed which Soldier Creek obtains prior to commencing seeding operations should be stored properly.

There are a few problems with the permanent seed mix for the topsoil/storage area. The correct scientific name for Wyoming big sage is Artemisia tridentata var. wyomingensis. This variety should be used rather than A. t. tridentata. The sagebrush and rubber rabbitbrush components of this mix, that do not have variety designations, can be eliminated. The amount of seed to be planted of the other varieties is sufficient.

Using certified seed where it is available would help to ensure receiving seed of good quality and known performance, but it is probably more important that adapted ecotypes be used. Even where species used in revegetation are the same as those in the immediate area, slight variations in genotypes and physiology can cause failure. The Utah Crop Improvement Association is beginning a program of having origin verified seed where seed collection locations are verified, especially for wildland shrubs. This program is not yet well established but hopefully will be by the time seed is needed for the proposed refuse disposal site.

The soil preparation and planting methods proposed should be successful if uncontrollable factors are favorable. There is a discrepancy in the amount of riparian area to be reclaimed. On page 3-27, it says that this area will be 1.0 acres, and on page 3-20 it says 2.4 acres.

The formula for determining s^2_p on page 3-25 is not correct. It should be:

$$s^2_p = \frac{[(n_{rv} - 1)s^2_{rv} + (n_{rf} - 1)s^2_{rf}]}{n_{rv} + n_{rf} - 2}$$

Where the subscripts rv and rf refer to the revegetated and references areas respectively.

Also, on page 3-25, one of the absolute value signs was omitted for the decision on comparing t values. Only a one-tailed test is necessary for bond release studies.

The application does not discuss a specific shrub density standard. The Division has proposed a revised regulation to comply with requirements of the Office of Surface Mining which states that minimum stocking and planting arrangements will be specified by the Division on the basis of local and regional conditions and after consultation with and approval by DWR and other Utah agencies responsible for the administration of forestry and wildlife programs. Consultations have been performed with Lynn Kunzler and Richard Stevens of DWR. They feel that in most cases the reference area standard should be used but that the standard may need to be changed for some communities, such as closed stands of pinyon-juniper and sagebrush. The standards identified in the plan of 2506, 3479, and 3051 woody stems per acre for the mountain brush, deciduous streambank, and sage-grass-juniper reference areas respectively will be used. If at the time of bond release application the reference area woody species densities are significantly different from these baseline standards, the baseline standards will be used. The proposed pinyon-juniper reference area is not acceptable as a standard for woody species density. The sage-grass-juniper reference area is suggested for this area as discussed below.

The subjective analysis proposed for evaluation of species composition and diversity needs to be supplemented with indices of similarity as shown in the guidelines. Unless better statistical tests are developed than are presently available, quantitative measurements alone cannot adequately describe these parameters.

The reference area proposed for the refuse disposal site is not acceptable to use as a

standard for species composition, diversity, production, or woody species density. The proposed reference area contains almost no grasses, shrubs, or forbs; it is dominated by pinyon and juniper to the almost complete exclusion of other species. The pinyon-juniper community does have other desirable characteristics used in evaluating revegetation success, such as the same seasonal characteristics, being compatible with the plant and animal species of the area, and being able to control erosion. While the site may eventually revert to this type of community, it is not desirable and should not be the goal of reclamation efforts.

The Applicant is concerned that using the baseline method or the sage-grass-juniper reference area as a standard for revegetation of the refuse disposal site may be unrealistic because of differences in the water regime that will be created by elevating the topography of the refuse disposal site and because the soils to be used in reclamation of the refuse disposal site are not of the quality of those in the sage-grass-juniper reference area. The adjacent sage-grass-juniper reference area is very similar to the area proposed to be disturbed in life form cover (91% similarity by the Ruzicka index). The soils of the area to be disturbed are variable, but most have reasonable chemical characteristics for establishing a community of salt and sodium tolerant grasses, forbs, and shrubs that would be more agreeable than pinyon and juniper. The seed mix proposed for this area has desirable species, but since the soils are somewhat high in SAR values, fourwing saltbush and black sage and perhaps other species should be included. A test plot to confirm this analysis is in order. The standard for success and revegetation methodology may need to be changed in the future depending on test plot results.

The monitoring program proposed should be adequate.

The field trials have not been monitored for a few years, but the data indicates some potential problems with woody plant density. Also, crested wheatgrass, a very competitive introduced species, was included in all of the field trial mixtures and is not contained in any of the final reclamation mixtures. Some alteration or reconstruction of these trials may be needed, but that assessment can be made when the plots are reevaluated in 1992 and 1994.

Deficiencies:

1. Certified noxious weed free hay or straw must be used for mulch on those areas where straw or hay is to be used. The Applicant must not accept seed that is sold in violation of the Utah Seed Act. Any seed that must be stored must be protected from heat and large variations in temperature.

2. The permanent seed mixture for the topsoil/storage area must be corrected to show Artemisia tridentata var. wyomingensis instead of A. t. var. tridentata. Also, rubber rabbitbrush (Chrysothamnus nauseosus) and big sagebrush (Artemisia tridentata) can be eliminated from this seed mix. These deletions are not meant to apply to the components with varieties; i.e., Wyoming big sage, mountain big sage, and rubber rabbitbrush (Chrysothamnus nauseosus var. hololeucus).

3. Soldier Creek must use seed of adapted ecotypes and origin verified seed collected from the area near the mine where it is available.

4. The discrepancy between page 3-20 and 3-27 in acreage of riparian area to be reclaimed must be resolved.

5. Methods for determining sample adequacy and conducting tests for bond release must be according to the "Vegetation Information Guidelines". The formula for determining s^2_p must be corrected.

6. The plan must be changed to show that standards for success for woody species density will be according to the baseline information for the appropriate reference areas or, if there is no significant change at the time of bond release application, the current conditions of the reference areas. The pinyon-juniper reference area may not be used to establish woody species density for the proposed refuse disposal area.

7. In addition to the qualitative evaluation of species composition and diversity proposed, quantitative analysis must also be made. The determination of success will be based on all of this information.

8. The reference area for the proposed refuse disposal site must be changed so that comparison will be made to a more desirable community than pinyon-juniper. The sage-grass-juniper reference area is recommended. If this area is used, diversity

indexes should use life form composition as the basis for determining revegetation success rather than species composition. The seed mix must include desirable salt-tolerant species, such as fourwing saltbush and black sage. Soldier Creek must commit to establishing and monitoring a test plot on the refuse disposal pile.

R645-301-342. Reclamation Plan: Fish and Wildlife

Proposal:

No additional enhancements are proposed during the reclamation and postmining phase of operations.

To establish useful and productive range and wildlife habitat and to create an aesthetically acceptable site, desirable and productive plant species will be planted on the best available seedbed material, and these areas will be monitored to maintain revegetated areas through the bond liability period.

Analysis:

The application does not include a statement indicating why enhancement of habitat is not practicable. Enhancement of some of the areas should be achieved with the revegetation standards that are set through R645-301-356.

Plant materials proposed to be used are mostly native to the area and desirable for wildlife. The techniques proposed with the minor additions being required here are the best available with current technology. Future technological advances and information gained from the test plot demonstrations may need to be incorporated into the plan later.

Deficiencies:

1. The Applicant must consult with DWR to determine if there are wildlife enhancement measures that can be used during the reclamation and postmining phase of operation, and, if there are none that can or need to be used, the application must contain a statement why enhancement is not practicable.

R645-301-352. Contemporaneous Reclamation
R645-301-353. Revegetation: General Requirements
R645-301-354. Revegetation: Timing
R645-301-355. Revegetation: Mulching and Other Soil Stabilizing Practices

Proposal:

Under Contemporaneous Reclamation, the only discussion is of the refuse pile. Section 3.41.21, however, contains a discussion of the use of the intermediate seed mixture and states that it will be used on those sites which are to be temporarily reclaimed, such as topsoil storage areas, temporary road locations, and unused disturbances associated with the Soldier Canyon Mine facility.

The General Requirements section contains general statements about the nature of the species that will be used in reclamation and the performance that those species are expected to produce. The vegetative cover will be diverse, effective, and permanent and will be comprised of species native to the area. It will be equal or greater than the natural cover of the surrounding area, capable of stabilizing the soil, and have the same growing season as the adjacent areas.

Timing of revegetation will be according to Section 3.41.10 which says that planting will be done in the fall planting season. Mulching and other soil stabilizing practices will be performed according to plans found in 3.41 and 3.41.23. Soil will be stabilized using the intermediate seed mixture found in 3.31.

Analysis:

The contemporaneous reclamation section should refer to the section dealing with the use of the intermediate seed mix. The other sections simply contain general commitments that are described in more detail in other sections of the plan.

Deficiencies:

None.

R645-301-356. Revegetation: Standards for Success

Proposal:

Standards for revegetation success are discussed in section 3.41.2.5 and Appendix 3F. References areas are discussed in Section 3.53.

Monitoring to determine the general success of revegetation will be performed in years 1, 2, 3, and 5 of the bond responsibility period and will determine if remedial action is necessary. Standards of success will be met in accordance with the approved postmining land use. Crop production on the revegetated area will be at least equal to that of the reference area.

Analysis:

Most of the criteria for standards for success are discussed under R645-301-341.250. There is no Appendix 3F in the plan.

There is no reference area for crop production, and the postmining land uses described do not include crop production.

Deficiencies:

1. Appendix 3F must be included in the plan.

2. The sections referring to crop production must be elaborated or, if they do not apply, eliminated. If crop production is one of the proposed postmining land uses, this must be discussed in Chapter 4, 'Land Use and Air Quality'.

R645-301-357. Revegetation: Extended Responsibility Period

Proposal:

The application states that Soldier Creek will provide extended responsibility for ten years and will submit a detailed plan for extended responsibility three years prior to the planned cessation of operations.

On page 3-23, the application states that the Applicant reserves the option of applying reasonable amounts of fertilizers, interseeding overgrazed areas, repairing minor rills and gullies, and performing weed control activities similar to those applied in recommended range management or grazing maintenance programs in eastern Utah without reinitiating the bond responsibility period.

Analysis:

Ten years is the appropriate responsibility period.

R645-301-357.300 specifically excludes augmented seeding, fertilization, or irrigation without extending the responsibility period. Any husbandry practices to be included under this regulation must be approved as an amendment to the Utah Coal Regulatory Program. The Division is currently working to have certain practices approved.

Deficiencies:

1. Any selective husbandry practice that might be considered normal conservation practice within the region must first be approved as part of the Utah Coal Regulatory Program. Augmented seeding or fertilization are not permitted under the current rules, and this section of the application must be modified accordingly.

R645-301-358. Protection of Fish, Wildlife and Related Environmental Values

Proposal:

Some of the commitments required by this section are contained in Sections 3.22.21 through 3.22.23 and 3.33. Disturbances and adverse impacts to wildlife and related environmental values will be minimized, and the Division will be notified of any state- or federally-listed endangered or threatened species within the permit area. Habitat will be preserved and enhanced where disturbance has occurred, and disturbances to wetlands and riparian areas will be avoided.

Analysis:

In Section 3.58.20, there is only a reference made to bald eagles. While these birds could occur within the permit area, none are known to nest in the vicinity. It is important that the Applicant realize that this regulation deals with both bald and golden eagles. The permit area contains golden eagle nests, and there is a potential through subsidence for taking of a golden eagle, its nest, or its eggs. As stated under R645-301-330 'Operation Plan', the application must include the recommendation from DWR about monitoring eagle and other raptor nests and also about avoiding and mitigating impacts.

Other plans for protecting wildlife and related values are considered to be adequate as addressed in this review.

Deficiencies:

1. The application must include methods to be used to monitor, avoid, and mitigate impacts to raptors, particularly golden eagles.

R645-301-411. Environmental Description

Proposal:

The application presents general land use information for Carbon County and more specific information for the permit area. Agricultural activity is limited to domestic livestock production. There are nine grazing allotments in and adjacent to the permit area. Table 4.11-3 shows these allotments and the extent of use. Chapter 3 contains plant production information and relates this to carrying capacities for livestock. Carrying capacities for wildlife have not been established.

Recreational use of the area includes hunting, hiking, biking, and camping. There are no known game fish in any of the waters located on or adjacent to the permit area.

There are no cemeteries or occupied dwellings in or adjacent to the permit area. The mine's surface facilities are located in Carbon County, zone CE-2, and the plan states that the Applicant has approval to operate in the CE-2 and M&G zones from Carbon County.

The application contains results and summaries from several archaeological surveys. Five sites were initially evaluated as possibly being eligible for listing in the National Register of Historic Places, but one of these was subsequently eliminated. None of these sites are in places where surface disturbance is proposed. There are also several sites in the Sage Point/Dugout Canyon area that are potentially eligible for listing. Most of the rest of the sites contain scattered lithic fragments, or are historical sites that contain limited amounts of trash.

Mining activity in Soldier Canyon began in 1906. The Rock Canyon and Sunnyside seams have been mined, and room and pillar mining methods have been used. Premining land uses in the area included industrial, agricultural, environmental, and recreational activities.

Analysis:

The Division of State History has sent letters dated August 20 and December 18, 1991, saying that they have no comment on the plan.

On page 4-8, there is a description of areas where the Neilson Consulting Group performed cultural inventories. The last one in this list should be T13S, R11E Section **25**, not 24. The portion of the survey in Section 25 included an intensive survey of part of the refuse disposal site. The entire refuse disposal site was included in another less intensive survey performed in 1979 and 1980.

Deficiencies:

1. The description of the areas surveyed in 1990 for cultural resources by the Neilson Consulting Group must be corrected.

R645-301-412. Reclamation Plan
R645-301-413. Performance Standards

Proposal:

On Page 4-1, the plan states that land uses in and adjacent to the Applicant's mine include industrial, agricultural, environmental, and recreational activities. These are the

same as premining uses and will be the postmining uses. Section 4.12.1, however, states that where surface disturbances resulted from mining operations, soil reclamation and revegetation will restore the areas to their premining usefulness as rangeland, wildlife habitat, and recreational use. This will be achieved through the methods proposed in other parts of the plan in a timely manner.

Analysis:

The land use description on page 4-1 appears to be a general description of the land uses of the area rather than a specific description of what the land use of the disturbed areas will be following reclamation. This needs to be clarified in the plan, however. No industrial use is proposed on page 4-9. Any industrial postmining land use on the disturbed area must be proposed and discussed clearly.

R645-301-412.200 requires that a copy of comments concerning proposed postmining land uses by the legal or equitable owners of record of the surface of the proposed permit area and Utah and local government agencies which would have to initiate, implement, approve, or authorize the proposed use of the land following reclamation be included in the plan.

Deficiencies:

1. The statement on page 4-1 concerning industrial use in the mine and adjacent areas should be clarified to show that a postmining land use will not be industrial. If an industrial postmining land use is proposed for the permit area, it must be clearly discussed in the plan.

2. The application must include a copy of comments concerning the proposed postmining land uses by the legal or equitable owners of record of the surface of the proposed permit area and Utah and local government agencies which would have to initiate, implement, approve, or authorize the proposed use of the land following reclamation.

R645-301-420. Air Quality

Proposal:

Appendix 4-D contains an Air Quality Approval Order, dated September 9, 1991, for the new coal handling facilities and waste rock disposal site. This replaces the Approval Order issued September 4, 1986, and allows for production of up to 3.5 million tons annually. The order contains the Applicant's air pollution control plan, including an air quality monitoring program intended to provide sufficient data for evaluating the effectiveness of the fugitive dust control program.

Deficiencies:

None

R645-301-500. ENGINEERING
R645-301-512. Certification

Proposal:

The Operator has committed to provide certified and regular inspections of structures as described in this section of the regulations.

Analysis:

The Operator is considered to be in compliance with the requirements of this section, except for the following drawings which were found in the plan and not certified:

Figure 8 DRAINAGE BASIN CHARACTERISTICS OF UNDISTURBED WATERSHED WEST OF THE MINE YARD.

Figure 21 DESIGN DETAILS OF PROPOSED SEDIMENT POND.

The drawings must be certified and submitted to the Division for approval in order to be considered in compliance with the requirements of this section of the regulations.

Deficiencies:

1. **Prior to permit approval**, the Applicant must submit certified copies of Figure 8 and Figure 21 to the Division.

R645-301-514. Inspections.

Proposal:

The Operator has committed to provide certified and regular inspections of structures as described in this section of the regulations.

Analysis:

The Operator is considered to be in compliance with the requirements of this section of the regulations. The Operator has committed to submit inspections and certified reports to the Division in accordance with the regulations.

Deficiencies:

None.

R645-301-515. Reporting and Emergency Procedures.

Proposal:

The Operator has addressed this section under Section 5.15 of the Mining and Reclamation Plan. The Operator has committed to notify the Division in the event of a slide or other hazard which may have a potential adverse effect to the public or the environment. In the event of a temporary cessation, the Operator must notify the Division in accordance with this section of the regulations.

Analysis:

The Applicant has provided the commitments required by this section of the regulations to address this section of the regulations adequately.

Deficiencies:

None.

R645-301-516. Prevention of Slides in SURFACE COAL MINING AND RECLAMATION ACTIVITIES.

Proposal:

None.

Analysis:

This section of the regulations is not considered applicable to the proposed mining operations.

Deficiencies:

None.

R645-301-520. Operation Plan.
R645-301-521. General.

Proposal:

Drawings have been resubmitted incorporating the proposed facilities into the disturbed areas.

The Operator has indicated that previously mined and presently mined areas are shown on Exhibits 5.22-1 and 5.22-2.

The Operator has referenced Exhibits 5.21-3 through 5.21-8, 5.25-1 and Plate 1 to show the areas of all areas proposed to be affected over the estimated total life of the coal mining and reclamation operations.

Analysis:

Discrepancies still exist between the drawings provided in accurately and completely delineating the disturbed area boundaries.

In particular, Exhibit 5.21-3 was provided to delineate the surface disturbance for the mine facilities area. The location and the extent of the disturbed area boundary on this drawing does not correspond to the disturbed area boundaries shown on other maps and figures presented in the plan for the mine surface facilities. The disturbed area boundary shown on Exhibit 3.7-2 differs from the one presented on the above referenced drawing. Reclamation drawings must also show the disturbed area boundary for reference. The disturbed area boundary shown on Exhibit 5.21-3 was traced onto Map 760a. Indications from this overlay indicate that reclamation treatments will occur during reclamation which are currently not within the proposed disturbed area boundary.

All maps used to show the location, design and extent of existing and proposed facilities as well as reclamation activities should include the disturbed area boundary for reference. This disturbed area boundary must be consistent in its location and extent throughout the Mining and Reclamation Plan. These drawings must be updated to show a clear and consistent disturbed area boundary throughout the Mining and Reclamation Plan.

Those drawings or exhibits which will be used to show the extent of the disturbed area boundaries for bonding purposes (such as Exhibit 5.21-3) should also indicate the number of acres which are included in the disturbed area boundary.

Delineation of the disturbed area boundaries on the maps and drawings must be revised, resubmitted, and approved by the Division in order to determine this section of the regulations complete.

Drawings delineating the disturbed area boundaries for the proposed refuse disposal facilities are still under review by the Division. The above comments and conditions also apply to those drawings where applicable.

Map 760a also has a contour bust which provides erroneous elevations for the reclamation contours. This contour information needs to be checked and appropriate changes to the map and subsequent engineering calculations should also be made.

The mine maps presented in the plan include projections into areas outside the

currently approved permit area. Projections showing the sequence and timing of mining activities in the Sunnyside seam, as shown on Exhibit 5.21-4, have actually projected mining activities outside of the permit area for 1991. The mine progress map (Exhibit 5.22-2) shows, as of 8-1-91, that development outside the currently approved permit area had not yet occurred, but that mining activities toward the First North section via the Main North First East entries was occurring.

Although lease acquisition of these areas adjacent to the permit area are being perused by the Operator at this time, approval of these mining projections is not possible due to the sequence and timing of those areas within this permit term. The Operator must not conduct any mining activities outside the approved permit area. Although acquisition of these lease areas are considered to be inevitable by the Operator and the Division, several problems occur by projecting the mine workings into these new lease areas.

To alleviate this problem a stipulation to the plan must be presented in the permit renewal to maintain mining and reclamation activities within the currently approved permit area.

Deficiencies:

1. **Prior to approval**, the Operator must commit to not conducting mining activities outside the approved permit area. All mining activities within the currently approved permit area shall conform to MSHA and lease boundary requirements by maintaining a minimum of 100 feet from the permit (lease area) boundary to the mine workings. No mining activities conducted within the permit area shall be conducted which will affect any areas outside the permit area boundary including, but not limited to underground mine workings and subsidence.

2. The Operator shall correct the contour information and elevations as necessary on Map 760a to provide an accurate depiction of the final reclamation contours. In the event that correction of the contour information on the drawing reflects changes in the mass balance calculations, all respective portions of the reclamation plan and the cost estimate for reclamation should be made.

R645-301-522. Coal Recovery.

Proposal:

The Operator has presented in the plan, a narrative discussing the conservation of coal resources. A summary of the conditions and restrictions which were evaluated during the mine design are listed in Section 5.22 of the Mining and Reclamation Plan.

Analysis:

In addition to the information presented in the Mining and Reclamation Plan, The R2P2's which were developed as a result of lease areas within BLM lands need to be incorporated into the Mining and Reclamation Plan in the appendices to the plan. The information and evaluation presented in the R2P2 is considered essential information in the formulation of the plan and coal recovery.

This section of the regulations will be considered complete when the Resource Recovery and Protection Plans for the BLM lease areas have been submitted to the Division for incorporation into the Mining and Reclamation Plan. Any additional lease modification to the plan which include BLM land will require the submittal of the R2P2 in conjunction with that proposal.

Deficiencies:

1. The Applicant must submit copies of the Resource Recovery and Protection Plans (R2P2's) for all BLM lease areas. These documents shall be referenced in the text of the plan regarding coal recovery, and, shall be included as an appendix to the Mining and Reclamation Plan.

R645-301-523. Mining Method(s).

Proposal:

Evaluation and design of the underground mining operations and mining methods is provided in the Mining and Reclamation Plan as Appendix 5-D of the plan. The Operator has proposed the use of both conventional room and pillar mining as well as the use of

longwall mining operations. A combination of both of these mining methods is considered by the Operator to be the best possible means of maintaining maximum coal recovery.

Plans and designs for roof control, ventilation, and mine layout are under MSHA regulatory requirements. The Operator has indicated that these plans have been submitted to and approved by MSHA.

Analysis:

The Operator is considered to be in compliance with the requirements of this section of the regulations.

Deficiencies:

None.

R645-301-524. Blasting and Explosives.

Proposal:

The Operator has committed to comply with all applicable state and federal laws regarding the use of explosives during the construction of the surface facilities expansion, and whenever blasting is required for the Soldier Canyon Mine. All surface blasting activities will be conducted by a certified blaster and records of blasting activities will be maintained at the mine. Storage and transportation of explosive will be conducted in accordance with MSHA requirements.

Analysis:

The Operator is considered to be in compliance with the requirements of this section of the regulations.

Deficiencies:

None.

R645-301-525. Subsidence.

Proposal:

The Operator has provided a survey of the overlying areas to be mined. Structures and renewable resource land that could be potentially affected by subsidence include; Questar's 20 inch gas pipeline, REI degassification facilities, County Road 53, Pine Canyon's private road, Soldier Creek and Pine Creek.

The Operator has indicated that the above resources and structures are listed on Exhibit 5.25-1.

As part of the subsidence control plan, the Operator has proposed the prevention of subsidence along Soldier Creek, County Road 53 and the Questar gas pipeline through the extent of Soldier Canyon. A buffer zone has been depicted in the mine plan in which no second mining will occur. Based on analysis of the pillar and overburden strength in these areas, first mining can occur without affecting the surface. Additionally, backstowing has and may occur within this buffer zone area to further minimize the potential for mine subsidence within that area.

The Operator has proposed alternative methods to protect or minimize damage to Pine Creek and the gas pipeline once it leaves Soldier Canyon and proceeds up Pine Canyon. The analysis of these alternative is provided in the plan as Appendix 10 and 5-D of the plan. Questar has preliminarily proposed to re-route the gas pipeline outside of the anticipated areas of subsidence.

The Operator has stated that regardless of the method used to protect the gas pipeline, that the final proposal will be incorporated into the MRP prior to the commencement of any full extraction mining beneath the existing pipeline.

Analysis:

The Operator is considered to be in compliance with the requirements of this section of the regulations. However, this review does not encompass a review of the subsidence control plan proposed for the new lease areas.

The Operator has relocated the western extent of the subsidence buffer zone on Exhibit 5.25-1 to accommodate longwall panels proposed in that area and further to the

north. No information was found in the plan that would allow for or accommodate this change in the buffer zone, the angle of draw used in projecting the subsidence buffer zone, or analysis for this change in the area which is currently approved to be first-mined only. The Operator must either revise the mining sequence in this area to accommodate the buffer zone indicated for Soldier Creek, County Road 53 and Questar's pipeline, or submit a detailed analysis and present engineering evidence that these changes will not adversely impact those renewable resource areas.

Deficiencies:

1. The Operator shall revise the mining sequence in this area to accommodate the buffer zone indicated for Soldier Creek, County Road 53 and Questar's pipeline, or submit a detailed analysis and present engineering evidence that these changes will not adversely impact those renewable resource areas.

2. The Operator must incorporate into the permit area, all areas impacted by subsidence or areas which potentially could be impacted by subsidence in accordance with the mine design and the angle of draw.

3. The Operator must further detail the subsidence buffer zone which has been projected to the north in Soldier Canyon. Changes to this buffer zone which are different than the design angle of draw projection must be explained and detailed adequately to allow the proposed buffer zone location.

R645-301-526. Mine Facilities.

Proposal:

The Operator has provided a narrative description of the mine facilities in Section 5.26 of the Mining and Reclamation Plan. Table 5.26-1 describes the types of structures, dates of construction, size and type of construction, and the general location of the structures. The Operator has indicated that all of the facilities meet the performance standards of Sub-chapter K and the R645-301-526 performance standards.

The Operator has also described those structures and facilities which are within the permit area, but are not considered as part of the mining and reclamation operations. These structures and facilities include Resource Enterprises, Inc., and the Questar pipeline.

Part of the proposed future construction in the mine facilities area include the construction of a coal preparation plant. Profiles and flowsheets for these facilities are found on Figures 5.26-1 and -2.

Analysis:

The Operator has adequately provided a description of the surface mine facilities and structures as required under this section of the regulations.

Maps have been provided by the Operator to show the location of the mine facilities.

Figures 5.26-1 and -2 have not been certified.

Deficiencies:

1. Figures 5.26-1 and 5.26-2 must be certified and resubmitted.

R645-301-527. Transportation Facilities.

Proposal:

The Operator has provided a narrative description of the present coal haulage conveyor system in Section 5.27 of the Mining and Reclamation Plan. From the storage silos and the truck loading bin at the mine site, the coal is then trucked 19.3 miles to the Banning Siding Loadout facility operated by Coal Service Company.

Proposed modifications to the current materials handling system include the addition of a coal processing plant, additional storage areas, and a conveyor and loadout system designed to accommodate anticipated production increase of up to 3.5 million tons per year.

When the new coal handling facilities have been constructed the present conveyor structure will no longer be used and eventually removed. Portions of the existing system will also be incorporated into the modified system and will remain as part of the operational

facilities.

Analysis:

The Operator is considered to be in compliance with the requirements of this section of the regulations. The Operator has provided a narrative of the coal handling facilities which currently exist and those which are proposed to be constructed within the permit term. Drawings and the locations of these proposed facilities are found within the plan, and flowsheets for these facilities are found on Figure 5.26-2.

The Operator is considered to be in compliance with the requirements of this section of the regulations.

Deficiencies:

None.

R645-301-528. Handling and Disposal of Coal, Overburden, Excess Spoil, and Coal Mine Waste.

Proposal:

Information has been presented in the plan under Section 5.28.

The Operator has located the temporary locations where waste materials are to be stored until such time as approval of the permanent refuse disposal facility has been made by the Division. The Operator has presented a sampling plan for the refuse material and has indicated that a sampling and runoff control plan developed by the Operator will minimize the potential for any adverse impact on the environment.

Analysis:

While the Operator has submitted the designs for the permanent refuse disposal facility, approval of this facility is not a part of this review. The Operator will be required to maintain waste at the temporary locations until such time as the Division grant approval for the permanent waste disposal facilities.

The Operator is considered to be in compliance with the requirements of this section of the regulations.

Deficiencies:

None.

R645-301-529. Management of Mine Openings.

Proposal:

The Operator has indicated that during operation of the mine, access to all mine openings are controlled by the Operator during working and non-working hours. Access to the mine areas is fenced and gated. Any mine area that is temporarily inactive, but has a future useful life, will be protected by barricades or other covering devices, fenced and posted with signs to prevent access and to identify the hazardous nature of the mine openings. These devices will be periodically maintained in good condition. Permanent sealing of these mine openings is discussed under Section 5.51 of the plan.

Analysis:

The information presented in the plan appears to meet the requirements of this section of the regulations.

Deficiencies:

None.

R645-301-530. Operational Design Criteria and Plans.
R645-301-531. General.

Proposal:

The Operator has indicated that the general design and commitments required to meet this section of the regulations are found within Section 5.30 of the plan and within the

calculations provided in Appendix 7 of the plan.

Analysis:

With regard to the mine facilities area, this section of the regulations has been met by the Operator. Additional analysis of the refuse disposal site will have to occur by the Division prior to approval of the facilities and structures proposed in that area.

Deficiencies:

None.

R645-301-532. Sediment Control.

Proposal:

The Operator has addressed this section of the regulations under Section 5.33 of the Mining and Reclamation Plan. The Operator has indicated that the design of the sediment control structures are presented in Chapter 7 of the plan and that these designs are intended to minimize the disturbance to the hydrologic balance by disturbing the smallest practical area and through contemporaneous reclamation to stabilize the regraded and contoured refuse material as soon as practical. These activities will result in a reduction of the runoff and sediment rate and volume expected from the site area.

Analysis:

The Operator is considered to be in compliance with this section of the regulations. Refer to comments by others regarding the hydrologic designs that are presented in the plan.

Deficiencies:

None.

R645-301-533. Impoundments.

Proposal:

Information regarding this section of the regulations is found in Section 5.33 of the plan. The only impoundment at the mine site is the temporary sediment pond used for sediment control during the life of the mining operations. The design and the geotechnical

analysis of the sediment pond embankment are found in Appendix 7. During construction of the pond, all vegetative and organic materials were removed and the foundation prepared to resist failure. Slope protection is provided existing vegetation on the embankment.

Analysis:

The information found in the plan is considered adequate to meet the requirements of this section of the regulations.

Deficiencies:

None.

R645-301-534. Roads.

Proposal:

The Operator has described the location and the intended use for all roads within the permit area under Section 5.34 of the plan.

Analysis:

The information found in the text of the Mining and Reclamation Plan is considered adequate to address the requirements of this section of the regulations. However, certification of primary road was not directly addressed as required under this section of the regulations and under R645-301-512.250, Primary Roads. The professional engineer will certify the design and construction or reconstruction of primary roads as meeting the requirements of R645-301-534.200 and R645-301-742.420.

Deficiencies:

1. The Operator must provide a certification statement for incorporation into the Mining and Reclamation Plan which states that the primary roads, as described in this plan, meet the requirements of R645-301-534.200 and R645-301-742.420.

R645-301-535. Spoil.

Proposal:

The Operator has indicated that no significant amount of excess spoil material will be developed by the underground mining operations. Spoils, as a result of sediment pond waste and construction, will be disposed of within the refuse disposal site proposed in the plan.

Analysis:

Comments regarding the disposal of spoil materials is considered to be adequate. Upon approval by the Division of the refuse disposal facility proposed in the Mining and Reclamation Plan, both the temporary and the permanent disposal locations for these materials will be incorporated into the plan.

Deficiencies:

None.

R645-301-536. Coal Mine Waste.

Proposal:

The Operator has proposed the construction of refuse disposal site in conjunction with the permit renewal. The Operator has addressed most of the proposed new waste facilities under Section 5.28 of the Mining and Reclamation Plan.

Analysis:

Information regarding the design and adequacy of the proposed refuse disposal facility is currently under review by the Division. Until such time as approval for these facilities is made by the Division no activities, as proposed within that area, can be conducted by the Operator.

Deficiencies:

1. **Prior to permit approval**, the Operator must commit to not conducting any mining and reclamation activities within the proposed refuse disposal facilities until such time as the plans submitted by the Operator have been reviewed and approved by the Division.

R645-301-537. Regraded Slopes.

Proposal:

Geotechnical analysis of the cut slopes associated with the mine are found in Appendix 7-E, part A-3 of the plan.

The Operator has stated that it is their intention that all fill areas will be regraded to achieve AOC requirements. Contour information is provided on Map 760a.

Analysis:

Information found within the plan has indicated that the regraded slopes as planned by the Operator meet the minimum factor of safety required for regraded slopes of 1.3. Based on the information provided in the plan and Map 760a, no highwalls will be left as part of the reclaimed area.

Some cut slope areas will be left above the storage area for the mine facilities, but that area is primarily rock and will be left in a stable condition and will blend in with the surrounding area.

The operation is considered to be in compliance with the requirements of this section

of the regulations.

Deficiencies:

None.

R645-301-540. Reclamation Plan.
R645-301-541. General.

Proposal:

The Operator has stated that when mining operations permanently cease the site will be totally reclaimed in accordance with the R645 Rules and this permit. All underground openings will be sealed and backfilled. All surface equipment, facilities and structures will be removed, except as described under Section 5.42. The post mining land use, and the performance standards of the state program will be achieved through reclamation efforts as described in the plan.

Analysis:

The Operator has provided the commitment required to determine this section of the regulations adequate.

Deficiencies:

None.

R645-301-542. Narratives, Maps and Plans.

Proposal:

The Operator has provided a timetable of the final reclamation activities in Table 5.42-1. of the plan.

Contours showing the final reclaimed surface are shown on Map 760a for the mine facilities area. Mass balance calculations have been provided by the Operator to demonstrate

feasibility of the reclamation contours proposed in the plan. These calculations indicate that there is an excess of material at the mine facilities area that is not required to achieve AOC requirements. The Operator has indicated that this excess material would be placed at the refuse disposal site.

The Operator has stated that unsuitable materials will be placed against the highwalls, the suitable material will be placed over the material.

The sediment pond at the mine site will remain in place and at the end of the 10 year reclamation period, will be removed and reclaimed.

Soldier Creek will relocate the Soldier Creek Road to it approximate original alignment during reclamation. Culverts necessary to maintain the integrity of the road will be permanently installed and will be maintained during the reclamation liability period. All other roads in the permit area will be removed and reclaimed.

Analysis:

Approximately 20,000 cubic yards of material from the mine facilities area is proposed to be disposed of at the refuse disposal site. In consideration of the size of the refuse disposal facility proposed, disposal of excess mine development waste in that area is considered appropriate.

The Operator may find that some or most of this material may be incorporated into the mine facilities design and still meet AOC requirements. Regardless of this the maps and plans shown in the plan do indicate that AOC requirements can be met.

The Operator has erroneously stated that the mine facilities sediment pond will remain for the 10 year liability period, then will be removed and reclaimed. The mine facilities sediment pond must remain operative until such time as the area meets the cover and density requirements for revegetation and effluent standards are met. When the Operator has demonstrated that these conditions are met, the pond can be removed. The pond may be removed only when these conditions are met, which may be less or more than the 10 year initial reclamation liability period.

Deficiencies:

1. The Operator must rephrase Section 5.42.50 to indicate that

sediment ponds will remain until such time as effluent limitations and vegetative requirements are met, and that upon satisfying those criteria, the sediment ponds will be removed and the associated areas reclaimed.

R645-301-550. Reclamation Design Criteria and Plans.
R645-301-551. Casing and Sealing of Underground Openings.

Proposal:

The Operator has addressed this section of the regulations in Section 5.50 through 5.51 and as reference to Section 5.42.70 of the Mining and Reclamation Plan.

The Operator has stated that when mine openings are no longer needed, they will be sealed and backfilled. The Operator states that discharges from the permanently abandoned mine portals is not anticipated.

Abandonment procedures are proposed to be in accordance with MSHA regulations. Slope or drift openings shall be completely backfilled with incombustible material for a distance of at least 25 feet into such openings. Shaft openings shall be completely backfilled or capped with 6 inches of concrete.

The Operator has further committed to submit detailed design drawings and specifications for sealing the shafts to the Regulatory Authority and MSHA for approval prior to permanent closure of the openings.

Analysis:

The information presented in the Mining and Reclamation Plan is considered to meet the requirements of this section of the regulations. The Operator has provided the specific commitments that are required by this rule.

Deficiencies:

None.

R645-301-552. Permanent Features.

Proposal:

The Operator has addressed this section of the regulations under Sections 5.52 through 5.52.20 of the Mining and Reclamation Plan.

The Operator has stated that at this time, it is not anticipated that there will be any constructed depressions or permanent impoundments as part of the final reclamation.

Analysis:

The Operator is considered to be in compliance with the requirements of this section of the regulations. Since no permanent depressions or impoundments are proposed, the specific application for the requirements of this section of the regulations is not required.

Deficiencies:

None.

R645-301-553. Backfilling and Grading.

Proposal:

The Operator has indicated in Section 5.53 through 5.53-24 that backfilling and grading will be done so as to create a reclaimed surface which matches the final reclamation contours shown on Map 760a. Highwalls and depressions will be eliminated as shown on Map 760a.

The Operator has committed to adequately cover all exposed coal seams with a minimum of 4 feet of non-combustible material in accordance with MSHA requirements. This information is found in Section 5.53.25 through 5.53.42 on page 5-84 of the Mining and Reclamation Plan.

The Operator has not proposed the use of cut and fill terraces for reclamation.

The Operator has indicated that much of the disturbance is pre-SMCRA and that pre-mining contour information is unavailable for these disturbed areas. All areas which have been disturbed post-SMCRA will be reclaimed to the approximate original contour. Pre-SMCRA areas will be returned to the best estimate of approximate original contour and will be contoured to blend in with the undisturbed topography adjacent to the disturbed areas.

The Operator has indicated that no surface coal mining will be conducted at the Soldier Canyon Mine.

The Operator has indicated that at the refuse disposal site, contemporaneous reclamation will occur throughout the operations. This will result in most of the surface of the refuse disposal site being reclaimed except for the final face of the pile which will be reclaimed during final reclamation. Since the reclaimed part of the refuse site will have been graded, settled and vegetated prior to final reclamation, regrading of the reclaimed part of the refuse disposal site during final reclamation will not be required. Only the unreclaimed face of the refuse disposal site will be reclaimed during final reclamation.

Analysis:

Because the Operator has committed to the elimination of all highwalls within the disturbed area boundary and to achieve AOC requirements, a request for variance from the requirements of this section of the regulations is not needed.

The Operator has adequately addressed the MSHA requirements regarding the covering of coal seams.

Portions of this section of the regulations which do not apply for this permit include: the use of terraces since the Operator has not proposed their use, and those sections of the regulations which are required only for surface coal mining operations. The Operator has not proposed any surface coal mining operations as part of this plan.

Deficiencies:

None.

R645-301-560. Performance Standards.

Proposal:

The Operator has indicated that all mining and reclamation operations at the Soldier Canyon Mine will be conducted in accordance with these R645 Rules and this permit.

Analysis:

The Operator has provided the commitment to meet the requirements of this section of the regulations.

Deficiencies:

None.

R645-301-800. Bonding and Insurance.

Proposal:

Information regarding bonding and insurance is found in Section 8 of the Mining and Reclamation Plan.

The Operator has provided a cost estimate for reclamation for the current mine facilities and the proposed facilities for the permit term, which include the coal preparation plan and ancillary facilities as well as the refuse disposal site. The Operator's cost estimate for reclamation of all of these facilities is $3,116,500. The detailed cost estimate is provided in Section 5.42 of the plan.

A copy of the certificate of liability insurance for the mining operations is found as part of Section 1.17.1 of the Mining and Reclamation Plan.

Analysis:

Information provided by the Operator is considered adequate to determine the bond amount required for reclamation.

The certificate of insurance provided by the Operator is shown as good until cancelled and appears to meet the regulatory requirements for general liability insurance.

Based on the Operator's cost estimate of $3,116,500 and applying the current escalation rate of 0.77% per year as determined from Means cost escalation information, the total bond amount required at this time is $3,238,000, rounded to the nearest $1,000.

The above bond amount may change due to considerations made in final review and approval of the refuse disposal facilities and a closer detailed review of the cost information provided by the Operator. Because this cost estimate and the bond amount determined above includes the refuse disposal facilities which are currently not approved by the Division, the bond amount determined above can be considered sufficient until such time as the Division provides final review and approval of the refuse disposal site.

The Operator currently has bond in the amount of $1,940,000. The Operator's cost estimate for the refuse area is approximately $680,000, including engineering and contingencies. Additionally, the demolition and removal of the proposed coal preparation plant and ancillary facilities which have not yet been constructed is approximately $150,000.

In conjunction with the approval of the refuse disposal site, the Division shall complete a detailed analysis of all of the cost information provided by the Operator and recalculate the bond amount which will be required for that approval. In the interim, the Operator shall provide bond in the amount of $3,238,000 as determined above and in conjunction with the permit renewal.

Deficiencies:

1. **Prior to permit approval**, the Operator shall provide a reclamation bond in the amount of $3,238,000. The current Reclamation Agreement for the Operator shall be changed to incorporate the bond revision, the exhibits showing the location and extent of the surface affected area, and appropriate riders from the surety company providing the bond amount. This revised Reclamation Agreement with bond in the amount of $3,238,000 shall be submitted to the Division prior to approval of the permit renewal.

R645-301-700. HYDROLOGY
R645-301-713. Inspection.

Proposal:

Impoundments will be inspected as described in Section 5.14 (pg.5-1, 5-2). Sediment pond and sewage lagoon inspections will be performed quarterly by a qualified person for the appearance of structural weakness and other hazardous conditions. The structures will be inspected at least yearly, until removal or release of the performance bond, by a professional engineer and certified inspection provided to the Division.

Analysis:

The Operator has stated that sediment pond and sewage lagoon inspections will be inspected quarterly, then indicates they will be inspected at least yearly. R645-301-514.300 states that yearly inspections, as well as quarterly inspections are required for impoundments. Yearly inspections will include a report with discussion of appearances of instability, structural weakness or hazardous conditions, as well as depth and elevation of any impounding waters, existing storage capacity, and any other aspects. The regulation also requires the registered professional engineer to provide the certified report to the Division promptly after each inspection.

Deficiencies:

1. Yearly and quarterly requirements must be clarified in text to meet the requirements of R645-301-514.300.

R645-301-722 and 731. Cross-Sections and Maps.

Proposal:

The Operator indicates the cross-sections and maps required are presented within this application. The locations and elevations of monitoring stations are presented on Exhibit 7.21-1.

The Operator indicates Exhibits 7.21-1, 7.21-2, and 7.24-1 show the existing surface and ground water locations, pg.7-1. The Operator indicates the location of surface water

bodies are located on Exhibit 7.21-1 and provides locations of springs and spring monitoring points, ground water monitoring wells, surface water sampling, NPDES discharge points and locations of natural drains. The locations of water supply intakes for current users of surface water flowing in the described area includes the Anderson Reservoir Ditch and Reservoir located on Exhibit 7.21-2. A map showing the location of each water diversion within the Existing Facilities is located on Exhibits 7.32-1 and Drawing E030. Location and depth to water in wells in the permit area and adjacent area are presented on 7.21-1. The Operator identifies wells SC-11G through SC-13G in the Supplemental Hydrologic report, Appendix I. Plate 1 is referenced for the location of those wells.

Analysis:

Locations and elevations of monitoring stations, relative to the topographic contours, can be determined from Exhibit 7.21-1. Drawing E030 does not include topographic information to Watershed #3 and #4. Exhibit 5.25-1 does not portray the full extent of the topographic region underlying the potential subsidence areas.

Those areas receiving discharges from affected areas in the proposed permit area include the NPDES discharge points located on Exhibit 7.21-1. The locations of water supply intakes for current users of surface water flowing in the described area includes only the Anderson Reservoir Ditch located on Exhibit 7.21-2. Table 7.24-2 shows water rights users from Soldier Creek but the water use intakes are not identified on a map. The Division is uncertain if the Operator has included users of surface waters downstream to the tributary of the Price River. The Operator must include these users since any decreased flow may affect users downstream of the Anderson farm.

The identification number for the spring located in Section 33 in T12S R13E is not legible. Depth for water in wells DM1,2,3,4,8 (mineshaft), and SC-1,8, wells 5-1, 10-2 are presented from 1982 on Exhibit 7.21-1. The Operator has not included the depth of the well.

Wells SC-11G through SC-13G could not be located on the monitoring maps. Plate 1 could not be located in the MRP.

The Operator has committed to in-mine monitoring of significant flows. The locations of water intercepted during mining for sites UG3N8E, UG10E, UG11E, UG2N2E, UG3N, UGMN3W, were not included on the indicated monitoring map. I believe UG shaft

is the location shown as 8 mineshaft although the connection is not clear.

The Operator has submitted a map, Figure 21, which contains outdated spillway and riser information.

Deficiencies:

1. The Operator must include location of water right use and intake points.

2. The Operator must show current pertinent information on maps to prevent confusion. Specifically Figure 21 requires information to be updated.

3. The Operator will identify all baseline wells, as well as monitored wells including SC-11G through SC-13 Exhibit 7.21-1.

4. The Operator will include Plate 1, which is referenced in the Supplemental Report in the MRP.

5. The Operator will submit a map clearly indicating the locations of past and present in-mine monitoring points.

6. The depth of the wells drilled in the area must be indicated on a map, and should be included on Exhibit 2.5-1.

7. Topographic contours will be defined for the complete area on all maps where contours are pertinent to the presented information. Specifically Drawing E030 and Exhibit 2.5-1.

R645-301-724. Baseline Information.

Proposal:

The location of springs, wells, and surface water sampling points in and adjacent to the LOM area are listed on Table 7.24-1 and are presented on Exhibit 7.21-1. The Operator

indicates there is no development of ground water in the perched or regional aquifers other than within underground mine workings, drilled for monitoring purposes (pg.7-3). Other ownership for water rights are identified in Table 7.24-2 (pg.7-8).

The Operators description of spring flow in the area is contained on pg. 7-34. The Operator identified estimates of:

Soldier Creek Base Flow measurement of 0.50 cfs.
Average annual volume of spring discharge is 360 ac-ft.
Average annual spring discharge in the LOM area is 190 ac-ft.
The underflow moving out of the LOM is in the range o.f 50 to 200 ac-ft/yr.

Analysis:

The January 8, 1992 letter from the Water Rights Department indicates that 39 water rights have been filed with their office within, and adjacent to, the LOM boundary. These new water rights should be included in the MRP as required by the R645 regulations.

Location of existing springs used for water rights are not indicated in the permit or located on maps. Although the Operator indicated the annual quantity of water availability and use, seasonal quantity of water availability and use was not identified.

Average annual volume of spring discharge is determined by taking a percentage (43%) of the total basin spring discharge over the LOM area + evaporation and consumptive uses (35.2 ac-ft). The Operator assumes that the percentage of springs/discharge is even over the basin when in fact it is likely that most of the contributing springs are located in the LOM area.

Deficiencies:

1. Update water rights information to include newly filed rights. Indicate if these rights are approved or in review status, and provide their location as required in R645-301-731.700.

2. Characterize the seasonal quantity of use as well as the seasonal quantity of discharge and flow rates.

R645-301-724.600. Survey of Renewable Resource Lands.

Operators Description:

All renewable resource survey information is incorporated into the subsidence control plan Section 5.25. The Operator indicates that the Soldier Creek and Pine Creek streams could conceivably be adversely affected (pg.5-16), then states the nature of subsidence resulting from the mine plan should not significantly affect any streams. The Operator sites Gentry and Abel (1978) demonstration that streams are protected by the "piling up" of the opposite facing ridge slopes during subsidence events. Therefore, mining induced fracturing in the stream bed area should be limited, or non-existent, and readily filled, (pg.5-17).

Longwall mining, or full extraction room and pillar, will be used to induce "uniform subsidence". According to Von Schonfeldt, et al. 1980, uniform subsidence rarely causes problems to renewable resources such as aquifers and streams. The Operator indicates Exhibit 5.25-1 shows the areas over which maximum subsidence may result. The maximum total subsidence would be approximately 12 ft for 2 seam full extraction.

Localized interception of groundwater flow and localized diversion through fractures may be expected as a result of mine induced subsidence (pg.7-81). The mudstone layers are expected to flow plastically to at least partially seal the fractures.

Available data suggests that the Book Cliff and the adjacent Wasatch Plateau act as recharge areas for regional groundwater systems (pg.7-7). The confined aquifers in the area have their source of recharge in an outcrop area some distance upgradient. There may be some leakage between overlaying and underlaying confined beds for perched aquifers, a source of recharge (pg.7-3).

Analysis:

The existing areas of full extraction are indicated on Exhibit 5.25-1. The Operator has not indicated if these areas were 2 seam full extraction, nor what seam they came from. The Operator has not identified the area of maximum subsidence including angle of draw.

The Operator states that recharge areas exist in the Book Cliff but does not provide a map survey showing the potential recharge areas in the permit area.

Deficiencies:

1. The Operator must present specific information on what seams were mined in the indicated full extraction areas. The Operator shall show the area likely to be affected based on the angle of draw.

2. The Operator must include a map survey showing the potential recharge areas in the permit area.

R645-301-724.700. Conducting Coal Mining and Reclamation Operations Within a Stream Location.

Proposal:

The Operator has not addressed this regulation for the existing mine facilities area.

Analysis:

The February 4, 1987 permit approval indicates that no lands designated as alluvial valley floors (AVF) occur on the permit area. The permit references MRP, Volume 2, Sections 3.8, 3.9. The attached CHIA indicates a negative determination based on the studies conducted by Sunedco Coal Company to the approved Sage Point Dugout Canyon mine plan. A potential AVF exists downstream along Soldier Creek. Although a negative determination of AVF existence in the permit area was determined. The Operator still must address this regulation for the mining operations area. See R645-302-320.

Deficiencies:

1. The Operator must incorporate AVF information from the current MRP that supports the original determination made by the Division.

R645-301-726. Modeling.

Proposal:

No modeling techniques are included

Analysis:

The Operator uses a numerical simulation, Model GWSIM-II, to determine ground water flow directions in the aquifer for a sandstone bed in the Blackhawk formation. The model was completed in 1983 and is confined to the portion of the permit in T.13 S. and does not include the area to the north.

Deficiencies:

1. The Operator shall clarify the text of the application to identify all modeling used and presented in the MRP.

R645-301-728. Probable Hydrologic Consequences (PHC) Determination.

Proposal:

The Operator has submitted a PHC for the LOM area. Located on pg. 7-27 through 7-94. Possible impacts to the surface and ground water systems in the area of the mine could affect the quantity of water in the mine area. Potential water quantity impacts are identified as interception of surface or groundwater, water consumption within the mine, and seepage from mine sumps, pg. 7-79.

The total annual volume captured from the mine would be approximately 191 to 238 ac-ft over the life of the mine, pg. 7-79. Water consumption and losses in the mine are estimated at 43.53 ac-ft (pg.7-83). Potential seepage from the mine sumps for the lowest seam proposed to be mined exists. Appendix I SHB report shows interception of low permeability geologic profiles with isolated confined perched aquifers. Some downward flow is possible but most data indicate upward flow into the workings.

The primary consequence of intercepting groundwater flow within the underground

working probably is to lessen the natural base flow discharge to Soldier Creek. Seasonal fluctuations in the Blackhawk are small indicating limited hydraulic connection between surficial recharge and these lower water-bearing units. Considering the complexity of the hydrologic system and expected impacts, the completion of more analytical studies for acceptance of the permit operations is not deemed necessary or desirable. It is adequate to recognize that the base flow of Soldier Creek may be lessened by the interception of water in the Blackhawk Formation by the underground workings (pg.7-80).

The Operator indicates a distinct planar surface apparently does not separate the Blackhawk formation from the overlying Castle Gate member. Table 7.24-7 indicates a significant drawdown in well 10-2 of the Castle Gate formation.

The Operator has indicated that a description of the possible contamination sources and impacts will be presented along with the mitigation and monitoring actions planned and in-place, pg 7-73.

The Operator sites the potential impact as increased sediment concentrations (TSS) and concentrations of dissolved solids (TDS) and salt concentrations decreasing the quality of the water in receiving streams (pg.7-84). Impacts cited could reduce useability for irrigation and stockwatering.

To minimize impacts the Operator has diverted a large portion of the undisturbed area through bypass culverts. All other drainage is treated by the sediment pond and alternative sediment control measures (Section 7.2). Runoff captured in the sediment pond is contained until it meets effluent limitation then is discharged. The Operator indicates the present sedimentation controls capture and treat all runoff.

Analysis:

The Operator describes the total annual volume captured over the life of the mine. Does the Operator mean total volume over the life of mine, or the average annual volume expected to be captured over the life of mine? What is the basis for this value? The value estimated on pg.7-33 is 125 ac-ft of ground water use per year for the mine, while pg. 7-83 indicates the total annual consumption of ground water to be 43.53 acre-feet.

Water consumption and losses in the mine are estimated based on the coal moisture, mine moisture, and air evaporation. The air evaporation is based on present mining capacities. The Operator lists the potential air intake from 2 fans capable of moving a

combined 1,095,00 ft³/min and has recently placed a third fan in the workings. The Operator uses 932,000 ft³/min. as the volume of air moving through the mine, therefore it is felt that the Operator has underestimated the losses by evaporation. The Operator does not identify losses due to the displacement of mine groundwater to surface water from the mine.

The Operator states the average annual discharge of groundwater by springs in the LOM is about 190 ac-ft and the approximate recharge within the basin is 310 ac-ft. Estimated underflow moving out of the LOM area is between 50 to 200 ac-ft/yr.

The Operator indicates that surficial recharge to the Blackhawk is small. This indicates potential for permanent dewatering of the base flow contributing from the Blackhawk. This and the fact that the Operator states the base flow and regional distribution will be affected requires analysis of the existing impacts to support the determination of no significant impacts. The Operator has not addressed the potential impacts to the Price River Formation, specifically dewatering the aquifer.

The Operator has referenced baseline hydrologic, geologic and other information collected for the permit. The Operator has not included "statistically analyzed data" with the PHC determination. The PHC determination must be based on available information to validate claims made by the Operator. Some average values are presented in areas to give general information. The determinations made by the Operator could be backed by quantitative statistical data analysis to strengthen their position for both water quantity and water quality. The Operator, however, has not presented other information, specifically operational data to support the PHC analysis presented.

The Operator incorrectly indicates that the area captures and treats all runoff when the area is treated for up to a specific storm design. The impacts for a storm of larger design is not determined by the Operator. Information including the potential natural impacts of the PMP vs. the potential for impacts of the PMP after disturbance could be used to assess impacts of sediment loading due to flooding. The Operator needs to address impacts from flooding because the stream alterations do not preclude flooding from that area.

The Operator should assess the impacts of the NPDES limits. The allowable percentage above background (baseline) water quality. The Operator should access the total potential percentage of sediments coming off the ASCA's and the expected filtering capacity of the alternate sediment controls backed up with data from monitoring if available.

Deficiencies:

1. Include operational and baseline data analysis showing the current information supports the determination that the impacts identified are not expected to be significant as required by 728.200 of this section. Provide operational data analysis for support of all other pertinent PHC for ground water and surface water seasonal water quality and quantity.

2. The in-mine consumptive use needs to be updated to project current and proposed conditions. Actual volumes of water discharged from in the mine to Soldier Creek must be quantified and included in analysis of ground water losses due in the mining area.

3. Figures used to arrive at all estimates should be clearly presented in the appendix or text of the MRP.

4. Include Probable Hydrological Consequences based on flooding including the potential for sediment contributions to streamflow.

5. Explain the significant drawdown in the Castle Gate Sandstone well 10-2 (pg.7-27) and the Probable Hydrologic Consequences on the Price River Formation.

R645-301-730. Operation Plan.

Proposal:

The Operator indicates that industrial waste will be reporting to the sediment pond as is indicated in Chapter 5, pg. 5-35. Monitoring will be conducted on all point source discharges in accordance with the NPDES, Permit No. UT-0023680, Table 5.262 (pg.7-97).

Analysis:

The Operator states that the discharge from the mine will be conducted in accordance with NPDES permit. In order to analyze whether the Operator is in compliance, and to assure the Operator has acquired the right to discharge industrial water at the pond discharge

point, the Operator needs to submit a copy of the permit as part of the application (as required by R645-301-122 and 731).

Deficiencies:

1. The Operator will include a copy of their NPDES permit for review by the Division before operations sending industrial wastes to the pond can commence.

R645-301-731.200. Water Monitoring.

Proposal:

In Mine

The Operator indicates the ground water monitoring plan will concentrate on water level, water discharge and water quality fluctuations of relative aquifers (pg.7-94). The plan will provide for the monitoring of parameters that relate to the suitability of the ground water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance set forth in R645-301-731. The frequency of monitoring sites will also be based on accessibility of the site.

The regulatory authority will be notified of any mine inflows in excess of 50 gal/min. Flow quantity and quality data similar to in-mine data will be collected monthly from inflow sources, until the inflow reduces to below perceptible levels, or stabilizes over a long period. If the flow stabilizes, then it will be sampled in a manner similar to in-mine groundwater. Wet areas in the mine that accumulate and produce a significant measurable flow in the mine during a 30 day period will be measured for flow (7-89).

Wells

As a result of the Mid-Term review observation well 6-1 was added to the monitoring schedule. A perforated zone was placed in the Blackhawk formation, beginning at 50 ft above the Rock Canyon seam, passing through the Sunnyside seam and ending at 250 ft above the Rock Canyon seam. The Mine development is expected to pass near drill hole 6-1 in 1990. As discussed with DOGM, our water monitoring schedule has been modified to

include drill hole 32-1 as an observation well (to replace hole 6-1).

Wells 5-1, 10-2, 6-1, 32-1 are proposed for monitoring levels. Not one of these wells is indicated to be within the same formation. Data from SC-1 and SC-8 are from the Rock Canyon Coal seam from 1982. No other data was located for these sites in the MRP.

Springs

The location of springs to be monitored are shown on Exhibit 7.21-1. The Operator indicates the proposed frequency for monitoring locations in Table 7.28-4, pg. 7-91, and the parameters to be monitored on Table 7.28-5, pg.7-92.

General

The Operator indicates that the data for wells will be collected if sites are available (pg.7-9) and that Groundwater and Surface water monitoring will proceed through mining and continue during reclamation until bond release (pg.7-97). Areas of underground monitoring will not be continued where mining is discontinued if data has been presented that shows the water characteristics for that area (pg.7-6). The operational sampling will continue until two years after surface reclamation activities have ceased (pg.7-90).

Analysis:

In Mine

Dave Darby's memo of December 8, 1986 indicates the operational plan for in mine monitoring would require the Operator to monitor sites that sustain a measurable flow over a 30 day period. The Operator indicates that areas of significant measurable flow would be measured. The Operator has not met the requirements agreed to according to Dave Darby's memo which implies that all measurable flows that are sustained over 30 days will be measured. Laboratory analysis for chemical parameters listed, in Table 7.28-5, will be performed on samples collected for all new sites. Thereafter, a representative annual laboratory sample analysis and quarterly field samples will be taken from sources that exhibit continuous measurable flows.

The Operator indicates areas where mining has been discontinued will not need to be

monitored if data has been presented that shows the water characteristics for that area. This is true, but only after the Division's approval. (See R645-731.241.)

The Operator indicates that the annual report will summarize the balance and quality of ground water contacted throughout the year. A map will be submitted that illustrates the source areas of sustained flow and the areas mined during the year. Dave Darby's memo states that the geologic nature of all sustained and anomaly flows will be calculated by the Operator. Dave Darby's memo also mentioned that wet areas in the mine, that accumulate and produce a measurable flow in the mine, will be measured. A representative annual sample and quarterly field samples will be taken from one of the sources. The Operator has omitted this in the proposed sampling scheme.

The Operator commits to informing the Regulatory Authority of any mine inflows in excess of 50 gal/min. The Operator indicates data similar to in-mine data will be collected. That statement is nonspecific.

Monitoring is to be based on the PHC, the Operator indicates the potential for impacts to base flow exist, therefore the Operator should also commit to presenting analyses for baseline streamflow in the annual reports. The Division of Water Rights requests that any diminution or interruption of flows from any source should be considered significant and be addressed accordingly. Any anticipated change or development of water should be reported to that office.

On December 5, 1989 Dave Darby addressed a memo concerning the midterm permit review. In the memo he indicates information for the observation well will continue until 1993 and that two additional drill holes, 32-1 and 32-2 on (Exhibit 3.2-1) could provide better long term monitoring data. The Operator indicates well 6-1 will be intercepted some time in 1990, and that one well 32-1 will replace the presently monitored well. The Operator indicates the perforated zone well 6-1 was started 50 feet above the Rock Canyon Seam and ended 250 ft above the Rock Canyon Seam, through the Sunnyside seam. The modification drill hole 32-1 includes a perforated zone above the Sunnyside seam. How can the new hole provide adequate replacement information if it is not even in the same area of the formation?

Additionally, the Operator has not provided information regarding the third well 31-1. In the midterm review of July 31,1989 (UMC 817.52), Mike DeWeese states the Operator must commit to install a third water well for static water level data.

Springs

The proposed discontinuance of ground water monitoring where mining is discontinued and for spring water monitoring 2 years after reclamation actives have ceased are not commensurate with R645-731.214. The Division **may** modify the monitoring requirements if demonstrated that 731.214.1. and 731.214.2. are met. The Operator is required to continue monitoring through reclamation until bond release. Because the Operator has not indicated a monitoring program for reclamation the proposed operation will be required until bond release or approved modification.

Deficiencies:

1. The Operator must correct "significant" measurable flow to measurable flows, including wet areas in mine that accumulate flow.

2. The Operator must commit to receiving Division approval before discontinuing any monitoring points.

3. The Operator must commit to include a summary showing changes in surface water quantity and quality over time in the annual report, and in summary in the 5 yr permit renewal. The Operator must commit to notify the Division of Water Rights office if it encounters any significant change in quantity or requires development of new water sources.

4. The Operator will reassess proposed well monitoring sites to assure compliance of monitoring potentially impacted aquifers, identified by the PHC and meeting other applicable R645 ground water regulations.

R645-301-731.220. Surface-Water Monitoring.

Proposal:

The Operator indicated 'Selected Utah Division of Health Numerical Standards for Water in the State for Agriculture Class 4' on pg. 7-23. The current uses include domestic,

irrigation, and stockwatering (Table 7.24-2, pg.7-8). Other uses include wildlife.

The Operator proposes that the surface water monitoring locations have been modified to accommodate the expanded boundaries of the LOM area. G-3 and G-4 will be moved to G-1 and G-2 so that inflow conditions will be monitored.

Analysis:

Some of the criteria for agricultural use is not sampled for in the proposed sampling regime. In order to determine adequacy for use those constituents should be sampled for at applicable source sites unless the Operator can demonstrate that there is not a potential for the constituent in the area due to operations.

The Operator proposes to site G-1 and G-2 into the head water area to accommodate the expanded boundaries. I agree it's necessary to measure the sites located in these areas due to the prevailing direction of ground water movement and thus potential baseline flow contributions. In order to determine the full potential impacts it's necessary to maintain sites G-3 and G-4 also. The Operator has already mined under the stream in the location of the surface sites. Impacts such as loss of baseline flow from the junction of the two tributaries can continue to be monitored, whereas the monitored sites at the headwaters cannot. The lower tributary could show potential impacts in decreased base flow but would not be able to detect which tributary is impacted, and would include mine water discharge influences.

Deficiencies:

1. Include analysis for surface water quality according to use in an extended annual parameter list, or demonstrate that the potential for those contaminates do not exist from mining activities.

2. Include monitoring sites G-1 and G-2 in the surface water monitoring program.

R645-301-731.300. Acid- and Toxic-Forming Materials.

Proposal:

The Operator indicates the earth and refuse materials will be handled in a manner

that prevents or controls, using the best technology currently available, the discharge of pollutants to the hydrologic system. The Operator commits to handle acid and toxic forming materials, in a manner that will minimize acid and toxic forming discharge to surface or groundwater (pg.7-94).

The Operator commits to:

1. Identifying, burying and/or treating, when necessary, materials which may adversely affect water quality, or be detrimental to vegetation or to the public health and safety if not buried and/or treated.

2. Storing materials in a manner that will protect surface water and underground water by preventing erosion, the formation of polluted runoff and the infiltration of polluted water. Storage will be limited to the period until burial and/or treatment first become feasible, and so long as storage will not result in any risk of water pollution or other environmental damage.

Storage, burial, or treatment practices will be consistent with other material handling and disposal provisions of R645 rules.

Under Industrial Wastewater/Water Pollution Control the Operator indicates that, "Any drainage of acid and toxic forming materials will also report to the sediment pond", (pg.5-40)

Analysis:

The Operator has committed to the requirements of the regulation, but does not meet the requirement of R645-301-731 describing how the regulation will be met. The Operator has not indicated a plan for meeting the requirements of the regulations. At what frequency will samples be analyzed for identification? What area and what measures will be provided for safe temporary storage? In another portion of the plan the Operator indicates that drainage of acid and toxic materials will report to the sediment pond (pg.5-40). That does not follow the requirements of this plan. The Operator has not included the measures to be taken to **avoid** acid or toxic drainage as required by R645-301-731.

Deficiencies:

1. Provide methods to be used to identify and provide for safe,

temporary storage. Identify where temporary storage will be placed, and how protection of hydrologic resources will be achieved.

2. The Operator must provide a design, such as a clay liner, for the pond that ensures leachate and drainage does not degrade surface or underground water (as required in R645-301-528.330). The Operator must include a sampling and pond waste removal plan that will assure proper disposal and handling of the pond waste materials.

R645-301-731.500. Discharges.

Proposal:

The Operator will not discharge into the underground mine, unless specifically approved by the Division and/or meets the approval of MSHA. Discharges will be limited to the following:

1. Water;
2. Coal processing waste;
3. Fly ash from a coal fired facility;
4. Sludge from an acid-mine-drainage treatment facility;
5. Flue-gas desulfurization sludge;
6. Inert materials used for stabilizing underground mines; and
7. Underground mine development wastes.

Analysis:

When the Operator indicates that, "...discharges will be limited to the following", it appears to imply that these discharges are approved. The Operator must clarify this discrepancy. The Operator has not correctly indicated that any approved underground mine discharge must be approved by both the Division **and** MSHA, not **"and/or"** .

Deficiencies:

1. Clarify the requirement that any approved underground mine

discharge must be approved by both the Division **and** MSHA. Not **"and/or"**.

R645-301-731.611. Applicable Utah or Federal Water Quality Standards

Proposal:

The Operator has provided a barrier to prevent degradation of the stream along the relocated county road. The Operator provides a sloping surface away from the stream in the parking area. The Operator has demonstrated the sediment pond is located out of the flood plain and has shown stability.

Analysis:

The Operator has not included methods to maintain water quality during reclamation operations. The Operator needs to commit to provide protection for the reclamation operations in the stream channel. Methods to provide protection include: in-stream channel work completed during low flow situations and routing streamflow around instream reclamation operations during activities. The Operator should inform any potential downstream users during instream construction. The Operator needs to commit to increased monitoring for turbidity and other potential impacts that may be in violation of state standards during construction.

Deficiencies:

1. The Operator must provide for protection of the stream channel during reclamation operation, specifically in stream construction, including increased monitoring during construction and a commitment to notify downstream users that may be affected by instream activities.

R645-301-732. Sediment Control Measures. Siltation Structures.

Proposal:

The Operator has identified the alternate sediment control areas (ASCA) in Section

7.42.2, pg. 7-102. The Applicant identifies as a 7, the topsoil storage site. The hydrologic analysis and design of the topsoil stockpile area can be found in Appendix G.

Analysis:

The Operator must correct Appendix G which indicates the site will contain temporary waste rock.

Deficiencies:

1. Correct Appendix 7-G to eliminate references to the temporary waste rock storage.

R645-301-742.212. Siltation Structures

Proposal:

The Operator discusses phased operations, order of removal and the activity to be completed. The Operator discusses restoring channel and disturbed areas and installation of silt fences in one activity description. The final portion of Phase I reclamation "Order of Removal 6" includes installation of surface runoff facilities. In Phase II the Operator states removal of ditches, sediment pond, extend culvert, and make repairs in permanent runoff system and revegetate.

Analysis:

The Operator does not indicate that siltation structure installment will occur prior to construction activities. No mention of alternate sediment control methods is included in Phase II reclamation.

Deficiencies:

1. The Operator must show that adequate sediment control measures are in place prior to construction operations.

R645-301-742.300. Diversions.

Proposal:

The Operator refers to diversions of the central mine facilities on pg. 7-118-120, within the text the Operator refers to the proposed new ditches. On pg. 7-118 the Operator has submitted ditches 1 and 2 as proposed concrete ditches. In the previously approved designs these were to be 1/2 round culverts a minimum of 18 inch diameter. The new ditches are proposed to be sized at 1.5' x 1.5' with grates for vehicular traffic.

Analysis:

The Operator has submitted the designs on pg. 7-199. The proposed changes will meet flow requirements. The proposed ditches are presently in the last stages of completion and should be readdressed as-builts.

Deficiencies:

1. The Operator shall provide as-builts for the completed ditches including necessary text changes to update the appendices, to current text references and maps.

R645-301-760. RECLAMATION.
R645-301-764. Structure Removal. The application will include the timetable and plans to remove each structure, if appropriate.

Proposal:

A time table for the removal of hydraulic structures is presented within Section 761.

Analysis:

The Operator has not identified the removal of culverts ditches and alternate sediment controls. The Temporary Topsoil Area and Lagoon were not identified in the timetable. The plans for culvert removal/reclamation require more detail to assure compliance with state water quality standards and minimization of contribution of sediment to the permit and adjacent areas.

Deficiencies:

1. The Operator must include all pertinent structures and adequate steps in the timetable to determine whether the protection of hydrologic resources is met.

R645-301-765. Permanent Casing and Sealing of Wells.

Proposal:

Any well drilled by the Operator, which is found within the permit area, will be capped, sealed, backfilled, or otherwise properly managed to prevent access to mineworkings by people, livestock, fish and wildlife, machinery, and to keep acid or other toxic drainage from entering the ground or surface waters (pg.7-146).

The Operator indicates wells will be sealed in a safe and environmentally sound manner in accordance with Section's 6.31, 7.38, and 7.65 (pg.7-98). Each exploration hole, bore hole, well or other exposed underground opening will be cased and sealed. The methods include filling the hole or opening with cuttings or inert material until it is level with the surface. Those holes which flow or might flow as a result of artisan conditions will be cemented. Holes which penetrate two or more aquifers with significantly different groundwater quality will be cased or cemented.

Analysis:

The Operator indicates the potential for water to contaminate the borings discussed in the Supplemental Hydrologic Study, Appendix I, exists. The Operator must follow the administrative rules for water well drillers. The Operator should include references to methods of installation and closure for each ground water well. The methods used to close each previously monitored well and well logs should be included in the appendix.

Deficiencies:

1. Commit to using follow the requirements of Utah Code Section 73-3-25. rules for water well drillers.

2. Include well logs for each water monitoring well drilled for

baseline and operational data.

3. Provide information on method of closures for each well previously monitored but no longer used, and the borings mentioned in the Supplemental Hydrologic Study (pg.17).

R645-302-320. Alluvial Valley Floors.
R645-302-321. Alluvial Valley Floor Determination.

Proposal:

There has been no presentation on alluvial valley floors at the main mine facilities site.

Analysis:

A pre-SMCRA disturbance in the exact location of today's mine site will not preclude disturbance of the hydrologic function of the AVF, but the Applicant must still present the information required under R645-302-320. The Division will determine whether an AVF is present.

Deficiencies:

1. Present the information required under R645-302-320.