ENVIRONMENTAL RESOURCE INFORMATION

The PAP contains sufficient slope measurements or contour maps to adequately represent the existing land surface configuration of proposed disturbed areas for underground coal mining and reclamation activities, to take into account natural variations in slope, and to provide accurate representation of the range of natural slopes and reflect geomorphic differences of the area to be disturbed.

Certification

All maps in Chapters 6 and 7 of the PAP have been certified by a qualified, registered, professional engineer.

Findings:

Maps, plans, and cross sections of hydrologic resource information provided in the PAP are considered adequate to meet the requirements of this section.

OPERATION PLAN

OPERATIONS AND FACILITIES

Regulatory Reference: R645-301-540

Analysis:

General:

West Ridge Resources, Inc., is proposing to develop an underground coal mine in the area of the Book Cliffs coal region NW of Sunnyside, Utah. The surface facilities will disturb approximately 25 acres in "C" Canyon. The applicant is proposing to ship run-of-mine product via a newly constructed Carbon County road to a nearly rail loadout facility. Annual production forecasts are anticipated in the vicinity of 3 million TPY; current leases estimate 20 million recoverable tons during the anticipated six year mine life. If additional State and Federal leases are procured, mine life could be extended to as high as twenty years, recovering an additional 27 million tons.

Type and Method of Mining Operation

West Ridge Mine will be developed by utilizing two continuous miner sections utilizing shuttle car/belt conveyor haulage. Head and tailgate entries, and ventilation bleeders will be developed using the same procedure, outlining the longwall panels. Upon completion of panel development, the applicant will move longwall machinery into place, and initiate high volume coal extraction.

Standard, accepted engineering practices will be used to construct, develop, extract, and reclaim the mine site.

All surface facilities within the "C" Canyon disturbed area will be reclaimed, with the exception of approximately 1000 feet of Carbon County road which will remain, as part of the approved post-mining land use. All man made materials will be disposed of in acceptable disposal areas. "C" Canyon will be returned to its pre-mining surface configuration by back-hauling all fill material either into the underground entries or to the fill's original borrow area.

The status of the reclamation requirements for certain other facilities which will be built to service the mine (i.e., the 49 KVA power line, the six inch water line, and the telephone communications lines) is unknown, as same will cross lands owned by SITLA, BLM and private ownership. These lands are generally outside of the Mine's permit area, ungoverned by SMCRA or the State of Utah R645 coal mining rules.

Facilities and Structures

Dams, Embankments and other Impoundments

The impoundments at the site will consist of a dual cell (in series) sedimentation pond to collect and treat all disturbed area runoff above the mine office parking area, and a small catch basin to treat the parking area runoff (ASCA "Z"). The embankments associated with same will be designed, constructed, and maintained using current, prudent engineering practices as mandated by the R645 coal rules.

There are no dams, slurry cells, or refuse embankments associated with the West Ridge Mine.

Overburden and Topsoil Handling and Storage Areas and Structures

This is an underground coal mining proposal; there will be no overburden removal.

The applicant is proposing to implement an experimental practice regarding the topsoil which exists within the disturbed area perimeter. That practice will be to protect the in situ material in place using geotextile fabric, and then revitalize same upon removal of the overlying fill material. The approval of this experimental practice prior to implementation rests with the U. S. Department of the Interior, Office of Surface Mining.

Two small topsoil storage areas have been permitted in the upper reaches of the left and right hand forks of "C" Canyon.

Coal Removal, Handling, Storage, Cleaning, and Transportation Areas and Structures

Coal removal will be achieved by underground longwall methods, utilizing continuous miner/shuttle car/conveyor haulage to develop the longwall panels. An annual production rate of 3 million tons per year is forecast.

Run-of-mine coal will be conveyed to the outside, where it will be temporarily stored in an open stockpile in the left hand fork of "C" Canyon. Reclaim facilities will reload the stockpiled coal onto an automated truck loading conveyor. The trucks will then transport the run-of-mine product to a rail loading facility via County and State roads.

As indicated, the permittee anticipates that only run-of-mine coal will be shipped from the facility; there will be no wet processing. The facility will probably have a small crusher for chunk reduction for the purpose of preventing blocked transfers.

Spoil, Coal Processing Waste, Mine Development Waste; Noncoal Waste Removal, Handling, Storage, Transportation Areas and Structures

This is an underground mining proposal; no spoil will be generated.

Only run-of-mine product is being anticipated; no coal processing waste will be generated.

The applicant anticipates that there will be very little mine development waste generated during the face up of the portal area. Any material that is produced from roof-fall cleanup, overcasts, or belt transfer construction can be stored underground. However, should it be necessary for mine development waste to be removed from the Mine, the applicant has permitted two temporary waste rock storage sites within the "C" Canyon disturbed area. The PAP proposes that the material be temporarily stored in these areas will then be hauled and permanently disposed of within the DOGM permitted waste rock facility, ACT/007/033.

Noncoal waste which is generated underground and on the surface will be collected, and temporarily stored in metal dumpsters strategically located within the disturbed area. It will then be hauled off of the permit area and permanently disposed of in a State permitted land fill. This paragraph is relative to combustible wastes only.

The PAP addresses the disposal of solid, noncombustible waste, (i.e., abandoned mining machinery) as being "placed and stored in a controlled manner in a designated portion of the "permit" area." Abandoned mining machinery is classified as noncoal waste under R645-301-528.331.

OPERATION PLAN

The PAP makes the commitment that "final disposal of noncoal mine waste will be in a State-approved solid waste disposal site such as ECDC."

The PAP also commits to proper handling and disposal of any "noncoal mine wastes" classified as "hazardous" under RCRA and 40 CFR Part 261.

The minimum regulatory requirements for disposal of noncoal waste have been met. No noncoal waste disposal areas are proposed within the surface disturbed area of the West Ridge Mine facilities area.

Mine Facilities

The West Ridge Mine will consist of the following facilities located within the "C" Canyon disturbance:

1) Mine office and parking area
2) A two cell in series sedimentation pond
3) An electrical substation which will step down 49 KVA to appropriate mine voltages
4) Warehouse facilities including lubricant and fuel storage
5) Maintenance shop facilities
6) Open storage facilities for bulk materials (i.e., roof bolts, rock dust, machinery, etc.)
7) Bath house facilities (2)
8) Mine ventilation fan
9) Explosive and blasting cap storage facilities
10) Conveyor systems, coal crushing, storage and reclaim facilities as well as truck loading facilities
11) Lamp house
12) Culinary water storage
13) Noncoal waste storage facilities
14) Undisturbed by-pass culvert through the facilities area
15) Mine portals

Water Pollution Control Facilities

The water pollution control facilities at the West Ridge Mine will consist of the following:

1) The undisturbed bypass culvert through the mine site disturbance.
2) The two cell in series mine site sedimentation pond.
3) Two ASCA's associated with the topsoil storage areas in the upper reaches of the left and right hand forks of "C" Canyon.
4) One ASCA associated with the Mine office/parking area.

It should be noted that as of 2/9/99, there is no treatment facility in place for the UPDES outfall #2, (mine water discharge point to the "C" Canyon drainage via the undisturbed by-pass culvert).

Findings:

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

OPERATION PLAN

EXISTING STRUCTURES

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

Analyses:

No surface or subsurface features, such as buildings, transmission lines, pipelines, or agricultural related features, exist in or near the proposed permit area. The Grassy Trail Reservoir is not inside the currently proposed permit area (see Map 4-1, Existing Land Use). Section 521.120 states that the only man made features which exist within the current proposed permit area are RS2477 roads. Section 526.110 states that no structures currently exist within the proposed surface facility area other than the monitoring well. This well is shown on Map 5-1, Previous Disturbance. There are no spoil, waste, noncoal waste, dams, embankments, sediment ponds, water treatment or air pollution control facilities within the proposed permit area. Map 5-1, Previous Disturbance shows the areal extent of the old coal exploration adit.

Findings:

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

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: R645-301-411

Analysis:

The proposed permit area contains no known sites listed or eligible for listing in the National Register of Historic Places and no public parks, cemeteries, or lands within the boundaries of any units of the National System of Trails or the Wild and Scenic Rivers System. Therefore, there should be no effect on these resources.

Findings:

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

RELOCATION OR USE OF PUBLIC ROADS

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

Analysis:

The C Canyon road is currently being upgraded and realigned by Carbon County in order to provide permanent and unrestricted access to State school trust lands and Federal public lands for multiple-use activities. On March 25, 1998 the Division completed a separate analysis (letter to Mine Permit File from Mary Ann Wright, Associate Director) in regard to "Permitting of Roads". The analysis indicates that during operation of the West Ridge Mine, the C Canyon Road will remain a public road, allowing access by multiple

purpose users up to a public turnaround area within the proposed mine surface facilities area. The C Canyon Road is found under this analysis to be exempt from regulation according to the State of Utah Coal Mining Rules, R645, et seq. and the UDOGM July 3, 1995 policy on roads. The road within the disturbed area boundary of the mine and mine roads beyond the public turnaround area and will be permitted and maintained by the coal mining company, Andalex, (the Permittee).

Findings:

Information provided in the plan meets the requirements of this section. For detailed analysis and findings see March 25, 1998 "Letter To File" from Mary Ann Wright, Associate Director.

AIR QUALITY

Regulatory Reference: R645-301-420

Analysis:

The application is required to show the coordination that has been undertaken with the Division of Air Quality to comply with the requirements of the Clean Air Act. Appendix 4-5 includes a copy of the Intent to Approve New Coal Mine in C Canyon from the Division of Air Quality. When the actual approval order is received, it will need to be included in the application.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations. However, the application will need to be updated as the Air Quality Approval Order is issued.

COAL RECOVERY

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

Analysis:

The Lower Sunnyside Seam is the most important coal seam in the area. According to information on page 6-3, it exceeds 6 feet throughout most of lease SL-068754, the West Ridge Mine area.

Thickness and nature of the Upper Sunnyside Seam is indicated on the logs in Appendix 6-2, but there is no analysis of this coal and no isopach map. From the bore-hole logs in Appendix 6-2, the Upper Seam appears thick enough to be mined; however, the applicant states that the average seam height is less than 4 feet, that it consists of six lenticular beds, and that it cannot be correlated between widely spaced data points (page 6-4). The Upper Sunnyside Seam lies as little as 5 to 10 feet above the lower seam in places and because of this thin interburden both seams cannot be recovered using current underground mining methods.

In leases SL-068754 and UTU-76577 the BLM has apparently determined the Upper Sunnyside Seam to be non-economic. Sterilization of this seam by mining of the Lower Seam will eliminate any need to reaffect these leases in the future through coal mining and reclamation operations.

Findings:

Operation information on coal recovery provided in the PAP is considered adequate to meet the requirements of this section.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: R645-301-525, R645-301-332

Analysis:

The PAP commits to implementing a subsidence monitoring plan by installing ground control points on the surface outside of the area susceptible to mining related impacts. Baseline data elevations and aerial photogrammetry will be used to evaluate subsidence, pre- and post-mining. The applicant includes a commitment to monitor subsidence annually. Once subsidence has reached the point at which the settling differential is less than six inches per year, that area will no longer be monitored. Subsidence monitoring locations are shown on Map 5-7, Subsidence Map.

Both Chapter 5 (page 5-18) and Chapter 3 (page 3-9) commit to replacing seep/spring quantities in the West Ridge area if the water loss is determined to have been caused by mining. WR-1 and WR-2 are the two spring sources on West Ridge which are used by livestock and wildlife. The number of cattle allowed to graze the area is determined by the flow quantities of the two springs. The commitments stated in both chapters are consistent and meet the requirements of R645-301-731.530.

Chapter 3 (page 3-8) of the PAP commits to compensation for the loss of any grazing animals due to mining induced subsidence. This meets with the minimum regulatory requirements of R645-301-321.

Findings:

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

SLIDES AND OTHER DAMAGE

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

Analysis:

The Applicant committed to comply with the requirements of R645-301-515.100 and R645-301-515.200. Those regulations require the Applicant to report slides and impoundment hazards to the Division. The Applicant will describe the remedial action that they will take to protect the public and the environment. The Division will review the action plan. If the plan is not adequate then the Applicant will follow the remedial plan developed by the Division.

Findings:

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

FISH AND WILDLIFE RESOURCE PROTECTION

Regulatory Reference: R645-301-333

Analysis:

Power lines will be designed and installed using raptor-proof designs. Hunting platforms could be installed on select poles.

Areas in the proposed permit area containing potential raptor nesting habitat will be surveyed in the field within one year of any mining activity that could result in subsidence. Should any nests be found, the applicant would consult with the Division, the Division of Wildlife Resources, and the Fish and Wildlife Service.

Surface water quality will be protected using sedimentation controls. The sediment ponds will be monitored for any adverse effects on wildlife, and these effects would be reported to the Division of Wildlife Resources. Should mining disrupt a seep or spring that was utilized by cattle or wildlife, the applicant would replace the quantity of water depleted from that source at a similar location unless the seep is restored naturally in a nearby area.

As mentioned above, there are six golden eagle nests in C Canyon near the proposed mine. Five are in the right fork, but the mine site is not visible from them. In addition, the closest part of the mine surface facilities to the nests is the topsoil pile where there should be little activity. Therefore, a buffer zone was established in the vicinity of these nests where no surface mining activities should occur.

Wildlife Resources did not consider blasting when it established the buffer zones, and blasting may be necessary during construction of the mine. According to the application, it is unlikely blasting will be

needed. There are two areas where it might be necessary if bedrock is encountered, but even if these areas have bedrock, it would probably be possible to use hydraulic pick hammers mounted on trackhoes. If the applicant must blast, it would be limited to daylight hours. The nests are about 4000 feet away and screened by both the canyon walls and vegetation. Considering these factors, blasting can be allowed but should be avoided if possible.

In the left fork of the canyon is a nest that was inactive in 1981, 1997 and 1998, and much of the proposed minesite is within one-half mile of this nest. The application says this nest would be considered abandoned under Bureau of Land Management guidelines and that no take permit is necessary. In a letter dated October 15, 1998, the Division of Wildlife Resources concurred with this assessment.

As mining begins, the applicant would need to continue to monitor the nests in the area and may need to obtain take permits. It may also be necessary to preclude birds from nesting in particular places because of the potential of losing the nests through cliff spalling or other results of subsidence. At other mines, chain link fencing material has been put over nests to keep birds away during the time when subsidence was anticipated.

Through water use, the mine has the potential of adversely affecting four threatened and endangered fish species of the Upper Colorado River. In Appendix 7-7, the application includes estimates of how much water will be used. It is estimated the mine would use 21,804,600 gallons or about 67 acre-feet per year, which includes evaporation from ventilation, washdown, culinary uses, and what would be used by the longwall, continuous miner, and roof bolter. Above one hundred acre feet per year, the Fish and Wildlife Service would require a mitigation fee. A final determination of effect will need to be made by the Office of Surface Mining, Reclamation and Enforcement in consultation with the Fish and Wildlife Service.

The site for potential topsoil borrow is in critical deer winter range, and the applicant has committed to perform mitigation work if the site is ever used. Because the site may not be disturbed, it is not necessary to perform the mitigation or pay for it at this time.

The Division requires enhancement or avoidance for areas of critical habitat, but it is understood the Bureau of Land Management requires mitigation for areas of high priority habitat as well. The mine site is in high priority habitat.

Some of the greatest effects on wildlife will be from the road. While the Division will not have jurisdiction over most of the road, drivers need to be instructed on the importance of maintaining a proper speed through the area and of removing any big game animals killed as far as possible from the road. Killed animals should also be reported to the Division of Wildlife Resources. By removing these carcasses or keeping them as far away from the road as possible, the risk of collisions with eagles, other raptors, and vultures can be reduced.

The applicant has committed to conduct wildlife education session for its and its contractors' employees. Many conflicts with wildlife can be avoided through knowing what actions may be detrimental or beneficial.

Findings:

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

TOPSOIL AND SUBSOIL

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

Analysis:

Chapter 2, Soils, Sections R645-301-230 through -234, and R645-302-200 through -218, discusses the soil's operation plan for the proposed West Ridge Mine. Topsoil protection incorporates traditional methods of salvaging/stockpiling and an experimental practice method for protecting soils in-place beneath operational-pad fills. The **Experimental Practice** is unique by taking a **Reclamation Approach** for topsoil protection. Relevant analysis information includes soil salvage, stockpiling, topsoil substitutes and supplements, and experimental practice. The Analysis section discusses operation information as follows:

- Topsoil and Subsoil Removal - Traditional Methods
- Topsoil Substitutes and Supplements
- Topsoil Storage

Topsoil and Subsoil Removal - Traditional Methods

For the purpose of maximizing topsoil recovery during construction, all topsoil salvage will occur under the on-site supervision of a Soil Scientist. Traditional methods for protecting topsoil resources will occur in (1) excavated topsoil areas and (2) excavated RO/RL Travessilla Complex areas.

Excavated Topsoil areas

Traditional topsoil salvage methods will occur from those areas of the mine yard where material will be excavated in order to achieve final yard configuration. Topsoil salvage areas are identified by the First Order soil survey as Brycan, Midfork and Strych soil units. A total of 6500 CY of topsoil is projected for salvage from 2.69 acres. Topsoil material will be excavated using a trackhoe, then trucked to the topsoil storage piles. The primary Topsoil Storage Pile is located in the right fork as shown on Map 2-4, Proposed Topsoil Storage Areas.

Topsoil salvage areas are identified on Map 2-2, Mine Site Order 1 Soil Survey, and on Map 5-10, Construction/Reclamation Area-types. Map 5-10 shows topsoil salvage areas as dark blue and labeled as Slope/Topsoil/Cut (S/T/C). Map 2-2 identifies topsoil salvage as follows:

Topsoil Salvage Areas and Volumes			
Soil Name	**Location**	**Acres**	**Volume (yd^3)**
Midfork	M1	0.23	552
	M2	0.22	537
	M3	1.5	3634
Strych	S1	0.27	656
	S2	0.14	342
Brycan	B1	0.32	785
Total		2.69	6506

RO/RL Travessilla Complex

The Permit Application Package (PAP) and Soil Resource Assessment report conclude the following for the RO/RL Travessilla Complex mapping unit:

- The RO/RL Travessilla Complex mapping unit is dominantly unsuitable for soil salvage.
- Topsoil salvage from the RO/RL Travessilla complex is limited to salvaging pockets of Travessilla soil under the direction of a soils specialist.

Since the RO/RL Travessilla Complex occupies the majority of the surface disturbance area within the West Ridge Mine site, then the "unsuitable" nature of this mapping unit for soil salvage renders the site generally "unsuitable" for reclamation success unless soil salvage occurs from these areas. The Soil Resource Assessment report further concedes that attempting to salvage the RO/RL Travessilla Complex soils might de-stabilize immediate upslope areas endangering equipment operators with possible boulder slides. However, the PAP operation plan clearly shows (as shown on Map 5-5, Surface Facility Map) that nearly every slope located along the entire length of "C" canyon, including the left and right hand forks, will be cut to widen the pad surfaces. The majority of these cut slopes are contained exclusively within the RO/RL mapping unit. If the RO/RL surface slopes, then they are safe for are safe for constructing cut slopes and likewise soil salvage. If the RO/RL soils and surface materials render themselves suitable for constructing purposes using conventional construction equipment, (e.g., sediment pond basins, and pad fill), then these same indigenous soil and rock material from the unconsolidated RO/RL surfaces can likewise be salvaged and stockpiled for later reclamation use.

The plan states that the RO/RL areas contain limited topsoil resources. The NRCS soil survey identifies the RO/RL Travessilla Complex mapping unit as containing significant amounts of soils (35% soils by volume - 25% Travessilla plus 10% other) that support a significant vegetation community - 750 lbs/acre of Pinyon/Juniper versus 1500 lbs/acre of Douglas Fir/Rocky Mountain Juniper in the Midfork soils. These "rocky" soils have intrinsic value for restoring RO/RL slopes and surfaces during reclamation to match current soil and vegetation conditions. The current vegetation community evolved to fit environmental conditions as they currently exist. Successful reclamation will therefore require the same soil and rock parameters as currently exist to establish revegetation success standards.

The plan identifies mixtures of rock and soil in the RO/RL Travessilla Complex mapping areas as naturally occurring **Colluvial Growth Material** (CGM). Since the RO/RL Travessilla Complex mapping unit contains 35% soils, CGM is in all aspects, a true soil and will therefore be protected and preserved as any other soil resource. These RO/RL soils will either be protected by salvaging the pockets of Travessilla soil first within the cut areas, or by preserving the soil and rock in-place in the fill areas. Soil preservation in-place is described under experimental practices. After salvaging the pockets of Travessilla soils from CGM areas, the remaining CGM material will be salvaged and stockpiled. Therefore, during construction and excavation of cut slopes in the RO/RL areas, the plan commits to salvage soil from the RO/RL Travessilla Complex unit as follows:

- During construction in the loop area and the coal pad slope area, the identified topsoil deposits, including the pockets of Travessilla soil, will be salvaged first and stored in the right fork soil storage area.

- The remaining colluvial growth/surface material (CGM) is also considered a reclamation resource. Therefore, the remaining CGM will be salvaged from the truck loop area and the west side of the left fork coal storage area as shown on Map 5-10, Construction/Reclamation Area-Types. The plan addresses CGM salvage in terms of dimensions, depth, and projected volumes of salvaged soil materials. The loop area CGM covers an area of about 59,400 square feet; the coal slope CGM covers about 21,600 square feet (see Map 5-10). Assuming an average salvage depth of 12 inches, approximately 2,200 cubic yards of CGM should be salvaged from the loop area, while 800 cubic yards is expected from the coal pile area.

- The plan states that isolated pockets of Travessilla soil will be salvaged from the RO/RL Travessilla Complex units outside the CGM areas where cut slope excavation will occur. Since these pockets of Travessilla soil are not delineated on the soils map, an on-site soils specialist will be present to ensure that these soils are salvaged during this phase of mine development.

Topsoil Substitutes and Supplements

Imported Gravel Fills

Appendix 2-5 gives the soil resource assessment of the gravel borrow material that will be used for fill during culvert installation and pad construction. There are presently two borrow sites which are the most probable sources of borrow for the mine. The first borrow site is located on Utah School Trust property and is presently under lease to Carbon County. This site is located approximately 2 miles from the mine site in Section 16 T.14S., R.13E. Based on DOGM's soil and overburden guidelines, gravel fills located on these pediment terraces located at the base of the Book Cliffs suitable as substitute topsoil based physical and chemical characterization. The School Trust site is undeveloped and is located in a previously undisturbed area.

An addendum to Appendix 2-5 describes a second commercial gravel borrow source. The area is identified as the Himonas Pit and is located about 7 miles from the mine site in NW¼, Section 1, T15S, R12E. The Himonas borrow site is part of an existing commercial gravel crushing and screening operation, complete with a developed water source and roadside access to the newly constructed C Canyon County road. These gravel fills are very dissimilar to the native materials in C-Canyon and contain higher levels of salt, sodium and selenium. Therefore, all gravels and fill materials from the Himonas pit will be pre-tested and approved prior to loading and hauling to the West Ridge site. Based on the Division's Guidelines for Topsoil

and Overburden, suitability of the material will be appraised on pH, EC, SAR and AB-DTPA extractable Se. Any material that falls outside the Division's acceptable criteria range will be rejected, segregated out, and not used as fill for the West Ridge site.

Topsoil Storage

The PAP states that soil salvaged from the cutslopes above the pads and from the M1, M2, B1, and S1 areas will be stockpiled, segregated in separate pile locations and preserved for final reclamation. Two separate sites are identified for soil storage. The primary stockpile is located in the right fork and the secondary pile is located in the left fork.

The sites are located up and away from the active mine yard area. The stockpiled soils will be seeded and mulched to minimize erosion. Both stockpile areas combined hold about 11,000 CY of soil with outslopes of 2:1 and depths ranging up to 15 feet. The outslope surfaces will be surface roughened and pitted to help retain moisture and minimize runoff. Map 2-4 shows details for each stockpile.

The primary topsoil storage area will be located in the right fork. This area is large enough to accommodate the total projected volume of salvaged topsoil. If extra capacity is needed, then the left fork area will be utilized for soil storage.

Construction of the topsoil stockpiles will begin by vegetation removal and installing the bypass culvert in the drainage channel. The stockpiles will be built up over the bypass culvert with diversion ditches installed along both flanks.

The CGM repository areas within the coal stockpile pad area, the sediment pond impoundment dams' out slopes, and the office pad are identified on Maps 5-10 and Map 7-4. Map 7-4 illustrates the sediment pond cross sections which show the CGM stored in the impoundment dam's interior core and out slope. A structural face of imported fill material, compacted to 95%, is placed over the CGM on impoundment dam's in slope embankment. Salvaged surface colluvium from the RO/RL Travessilla Complex unit contains significant quantities of soil (25% Travessilla and 10% other soils) in addition to rock and native parent material. The following apply for salvaging and stockpiling CGM:

- Salvage of all topsoil, including pockets of Travessilla soil, and CGM will be under the direction of an on-site soils specialist.
- Topsoil and pockets of Travessilla soil will be salvaged separately from the CGM and stockpiled with the other topsoil in the right fork topsoil storage area. CGM salvage areas include the loop area and the coal pad slope area.
- The Loop CGM storage areas, located on the sediment pond out slopes (Map 5-10), will be identified as topsoil storage areas, properly signed and protected.
- The CGM material placed on the out slopes of the pond embankments will be roughened and seeded with the interim revegetation seed mix. The reseeded area will then be mulched.

Construction Sequence Summary

Map 5-11, Construction Sequence, illustrates the different stages of construction for the West Ridge Mine site, which includes the experimental practice methods. Steps 1 through 4 are preparatory steps prior to topsoil salvage. Step 1 is removing vegetation; Step 2 is installing culvert and culvert backfill; Step 3 is the implementation of the Experimental Practices by installing geotextile fabric over topsoil fill slopes or marker

strips over the RO/RL fill slopes; and Step 4 is pulling boulders from the surface of slopes that will be cut. Topsoil salvage occurs in Step 5. After topsoil salvage has occurred from the topsoil area and RO/RL areas, excavation of the side slopes will occur in Step 6. These excavated native materials will be used as pad fill and will be placed over the backfilled culvert adjacent to the cut slopes. Step 7 shows completion of the pad level by hauling in imported fill from offsite, commercial gravel borrow areas. A final cap layer of road base material is placed over the imported fill surface as shown in Step 8.

Findings:

The information provided meets the regulatory requirements of this section.

INTERIM STABILIZATION

Regulatory Reference: R645-301-331

Analysis:

The plan for interim revegetation is to seed the mixture shown in Table 3-3 in late fall or early spring on topsoil stockpiles and regraded slopes. Among the areas that would be seeded are the outslope of the sediment pond, fill slopes, and side slopes.

Alfalfa is the only introduced species in this seed mixture, and it is not expected to spread inordinately or to dominate the other vegetation. The species in this mixture should provide good erosion protection.

In areas where the interim seed mixture will be used, the soil surface will first be roughened or gouged. Fertilizer would be applied if necessary and the area seeded in late fall or early spring. The interim seed mixture will be hand broadcast and the areas raked to cover the seed. Straw mulch would then be spread with a mulch and tackifier applied over the straw in larger areas such as the topsoil stockpile.

Canyon sweetvetch is included in the seed mix for both interim and final reclamation. The seeding rate will depend on future field tests and seed availability. It will be planted on topsoil piles both for interim revegetation and to propagate seed for final reclamation. Areas planted with this seed will need to be monitored closely.

This rule requires the applicant to minimize disturbance. As far as possible the applicant needs to avoid using the topsoil borrow area.

Findings:

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

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

OPERATION PLAN

Regulatory Reference: R645-301-521, -301-527, -301-534, -301-732

Analysis:

The primary access and haulage route to and from the mine will be the C Canyon County road, which is a public road under the jurisdiction of Carbon County. Carbon County has provided authorization to Andalex Resources to construct their mining facilities within 100 feet of the C Canyon road and also maintain approximately 1000 feet of the road as part of the mining operation. The application states, "Approximately 1,000 feet of the northern end of the Carbon County road will extend into the minesite disturbed area. The road will terminate at the junction of the truck loop. A turn around will be constructed at this terminus to give public vehicles an opportunity to turn around without having to drive through the mine yard. This 1,000 foot long segment of the public road, from the terminus of the road at the truck loop junction to just below the office at the southern end of the disturbed area, will be included within the permit area of the West Ridge mine and will be classified as a primary road. Carbon County will allow special mine-related utilization of this segment of the road, such as the ability to operate mine vehicles thereon. In return, WEST RIDGE Resources, Inc. will be responsible for maintenance along this road segment, including maintenance of drainage ditches and culverts. Runoff from this road surface will be treated according to the mine's sedimentation and drainage control plan, as presented in Appendix 7-4. Refer to Figure 5-3 West Ridge Road - Typical Cross-Section for the typical engineering cross-section of the Carbon County road."

An Analysis and Finding for the C Canyon Road were previously done on March 25, 1998 (See letter to file from Mary Ann Wright, Associate Director, Mining). The analysis determined that the C Canyon road leading from County Road 123 up to the proposed West Ridge Mine disturbed area boundary is exempt form regulation under the Utah Coal Regulatory Program and that section of road inside the disturbed area boundary will be permitted.

The mine roads that are planned for use as part of the operation are shown on the Surface Facilities Map (Map 5-5). All primary roads are planned so as to meet the standards applicable to primary roads and their designs have been certified by a registered professional engineer.

Findings:

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

SPOIL AND WASTE MATERIALS

Regulatory Reference: R645-301-528.300, R645-301-536

The construction of overcasts, and belt transfer points will require the taking down of primary roof (average mineable thickness of the Lower Sunnyside is approximately eight feet).
In terms of handling and disposing of mine and underground development waste, excess spoil , coal processing waste, the application states the following:

- Underground development waste will primarily be stored underground in "gob" rooms. Therefore, all waste generated from the construction of overcasts, belt transfers, and other areas requiring additional height will be stored underground.

- The PAP commits to placing any mine development waste generated at West Ridge which cannot be stored underground in a permitted site approved by the DOGM; the waste storage facility at the Wildcat Coal Loadout facility is the permitted area to be utilized. Any mine development waste which is hauled to the surface at West Ridge Mine will be temporarily stored in two areas of the "C" Canyon disturbed area until 12 cubic yards has accumulated, or 180 days has passed. Locations are depicted on Map 5-5, Surface Facility Map. Section 528.320 requires that coal mine waste will meet the design criteria of R645-301-536. As the Wildcat storage facility is already permitted, these requirements have already been met. The PAP is discussing the final disposal of any mine development waste hauled from West Ridge to Wildcat, the requirements of R645-301-536.510 **must be addressed via an amendment to the Wildcat permit, ACT/007/033 before any material can be hauled from the West Ridge permit area to the Wildcat Loadout.**

- There will be no coal processing waste generated, as the applicant intends to ship run-of-mine product.

- The application makes a commitment to dispose of sediment pond cleanout material in a State permitted landfill, such as ECDC. The ECDC facility is not permitted by the Division to receive underground coal mine waste. ECDC is permitted and bonded by the State to dispose of hazardous waste. Material disposed at the ECDC facility will be placed in a lined cell so that leachate will not adversely effect surface and groundwater, will be stable, not adversely effect the postmining land use, not create a public hazard and prevent combustion.

  The Utah Coal Rules do not specially state that underground mine development waste can be shipped to a State approved hazardous waste disposal facility. R645-301-536.500 does allow underground coal mine waste to be shipped offsite to an approved waste disposal site.

  R645-100 defines a permit area as: **"Permit Area"** means the area of land, indicated on the approved map submitted by the operator with his or her application required to be covered by the operator's performance bond under R645-301-800 and which will include the area of land upon which the operator purposes to conduct coal mining and reclamation operations under the permit, including all disturbed areas, **provided that areas adequately bonded under another valid permit may be excluded from the permit area.**

  Since the ECDC facility is permitted and bonded to accept hazardous waste material the Division will allow the Applicant to dispose of underground mine development waste at that facility even though the ECDC facility is not in the permit area.

- The face-up of the four portals at the lower Sunnyside outcrop will probably generate some non-saleable product. This will be placed in the surface facilities pad as part of the fill. The applicant commits to meeting all requirements of the R645 rules mentioned under 528.340. Map 5-10, Construction/Reclamation Area-Types, shows the placement location of the face-up development waste in the facilities pad. If the material tests positive for acid and/or toxic forming, then it will be disposed at State permitted disposal site, such as ECDC. ECDC is not a DOGM permitted site. This may present a problem.

Findings:

The West Ridge PAP has met the minimum regulatory requirements for placing any mine development waste generated off the permit area; the permit for the receiving area must be amended before any material can be shipped.

HYDROLOGIC INFORMATION

Regulatory Reference: R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Operational Water Monitoring Plan

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

Baseline monitoring will be performed until construction of the mine and mine facilities begins. Once construction is initiated, the operational monitoring schedule will be utilized. Monitoring will continue through reclamation until bond release. Operational field and laboratory parameters will be measured for the first two years of mine operation.

Locations of operational monitoring stations are depicted on Map 7-7. Operational monitoring locations, hydrologic monitoring protocols, and sampling frequencies are listed in Table 7-1. Operational field and laboratory hydrologic monitoring parameters for surface water are listed in 7-2. Operational field and laboratory hydrologic monitoring parameters for ground water are listed in Table 7-3. The hydrologic monitoring parameters have been selected in consultation with UDOGM directive Tech-004.

The applicant proposes that operational field and laboratory parameters will be measured for the first two years of mine operation, after which, if sampling has adequately characterized the hydrology in the area, a request will be made to reduce monitoring to field parameters quarterly and one operational analytical sample collected during low flow (August or September). The applicant is of the opinion that the physical parameters and chemical composition of springs and streams in and around the permit area should be

adequately characterized following the collection of three years of baseline laboratory data and two years of operational laboratory data. Continuing laboratory analyses for operational parameters beyond two years will probably not enhance the understanding of hydrologic systems, and monitoring of field parameters (flow or water level, pH, specific conductivity, and temperature, plus dissolved oxygen for surface water) during mine operation will identify mining-related impacts to the discharge and chemical characteristics of streams and springs in the permit and adjacent areas. If the field parameters at any sampling site deviate significantly from historical values, monitoring of operational laboratory water quality will resume at that site.

The applicant believes that discontinuance of laboratory parameters after two years of operation is acceptable for two reasons. According to the applicant mechanisms whereby the chemical composition of springs and streams that are above the mine workings can be adversely impacted by mining activities are absent. The applicant also states that this type of ground-water monitoring program has been approved for the Soldier and Dugout Canyon Mines, ten miles north of the West Ridge area.

A procedure for modifying the monitoring plan is outlined in UDOGM directive Tech 004, Part 5E. The applicant has not yet met these criteria. Amendments to monitoring programs will be approved on a site specific basis. Generally, quarterly sampling will still be required at each surface-and ground-water monitoring location. Required monitoring may be reduced to field parameters and the parameters identified in R645-301-731.200 on a quarterly basis plus one complete operational sample collected during the low flow (August or September) season if, using the monitoring data obtained, the operator demonstrates: that the operation has minimized disturbance to the prevailing hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; that water quantity and quality are suitable to support approved postmining land uses; or that monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan. Inaccessibility will not be considered an excuse to forego the annual operational sample.

{By following the procedure in directive Tech 004, UDOGM concluded that the requested modification of the Soldier Canyon Mine monitoring plan was justified at the time the Alkali lease addition was approved. Furthermore, the monitoring programs at Soldier and Dugout Canyon Mines are subject to ongoing evaluation by UDOGM to assure that the monitoring is meeting the objective of protection of the hydrologic balance and that the monitoring includes parameters that relate to the suitability of the water for current and approved postmining land uses. The modified monitoring programs at both Soldier Canyon and Dugout include semi-annual (high-flow and low-flow) water-quality analysis and weekly base-flow hydrograph measurements during "wet" and "dry" years that are not included in the proposed West Ridge monitoring plan nor in Tech-004. Furthermore, failure to establish the distinction between baseline and operational monitoring produced some confusion at the Dugout Mine, and the Dugout ground-water monitoring plan now includes, in addition to the "wet" and "dry" year monitoring, quarterly laboratory analysis for operational parameters for at least two years, and analysis for baseline parameters every five years.}

Table 7-1 indicates data will be collected quarterly, with bottle samplers to be checked following precipitation events. There is a commitment that water monitoring reports will be submitted on a quarterly basis to UDOGM on page 7-20. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator will promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance (p. 7-20).

Groundwater Monitoring

OPERATION PLAN

Operational hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Table 7-1. Operational field and laboratory hydrologic monitoring parameters for surface water are listed in 7-2. The hydrologic monitoring parameters have been selected in consultation with UDOGM directive Tech-004. Locations of monitoring sites are on Map 7-7.

In order to comply with UDOGM directive Tech-004, samples will be collected for analysis of baseline parameters during the low flow (fall) sampling beginning with the first mid-term review. This will be repeated every five years until reclamation is complete (p. 7-20).

Springs

Seven springs in the permit and adjacent areas will be monitored. SP-12, SP-13, SP-15, and SP-16 discharge from the lower slopes of West Ridge in Whitmore Canyon. WR-1 and WR-2 discharge from the upper slope of West Ridge in Whitmore Canyon. According to the applicant SP-8 is the only spring suitable for monitoring on the west side of West Ridge, and maps and data submitted by the applicant support this. SP-8 discharges in the upper drainage of C Canyon.

Wells

Only one ground-water monitoring well, DH 86-2 in C Canyon, exists in the permit area. It is open to the entire thickness of the Sunnyside Member of the Blackhawk Formation, which is below the coal seam that will be mined. Baseline monitoring will be performed until construction of the mine and mine facilities begins. After construction begins, operational monitoring will be measurement of water levels only (p. 7-21 and Table 7-1). Monitoring will continue through reclamation until bond release (p. 7-22).

Sealing of the ground-water monitoring well and any future wells will comply with R645-301-748 (page 7-37).

Sunnyside City and East Carbon City have a water right for 31.621 ac-ft per year from water-supply well DH 90-1 in the SW¼ SW¼ of Section 17, T. 14 S., R. 14 E. (DH 90-1 is shown in the nw1/4 nw1/4 of Section 16 on Map 7-6). The well has a total depth of 500 feet, with a gravel pack from 207 to 500 feet below ground surface. According to information from the Sunnyside Coal Company that is cited in the PAP, the well is completed in the Price River and North Horn Formations. Because the well is located over a mile from the lease boundary, and is completed in the Price River and North Horn Formations, the applicant feels it is very unlikely that mining in the permit area will affect groundwater systems that contribute water to DH 90-1 (p. 7-5), and it is not included in the monitoring plan.

Surface Water Monitoring

Operational hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Table 7-1. Operational field and laboratory hydrologic monitoring parameters for surface water are listed in 7-2. The hydrologic monitoring parameters have been selected in consultation with UDOGM directive Tech-004. Locations of operational monitoring stations are depicted on Map 7-7.

In order to comply with UDOGM directive Tech-004, baseline samples will be collected from each stream monitoring site in the monitoring program during the low flow (fall) sampling beginning with the first mid-term review. This will be repeated every five years until reclamation is complete (p. 7-20).

The applicant will obtain a UPDES discharge permit to cover any possible discharge from the sediment pond (page 7-45).

Streams

Grassy Trail Creek is the only perennial stream in the permit and adjacent areas. The permit area does not include any significant portion of the upper Grassy Trail Creek watershed. Nevertheless, two sites on Grassy Trail Creek will be monitored. Stream site ST-3 is located below the confluence with Hanging Rock Canyon and is upstream of the permit area and Grassy Trail Reservoir. Stream site ST-8 is located just above the confluence with Water Canyon, downstream of the permit area and Grassy Trail Reservoir.

On the west side of West Ridge, five stations will monitor ephemeral drainages contributing to lower Grassy Trail Creek: ST-4 in lower Bear Creek; ST-5 below the confluence of B and C Canyons; ST-6A and ST-6, respectively above and below the mine site in C Canyon; and ST-7 in lower A Canyon. ST-4 will be simply visual observation of the channel for flowing water. ST-5 will have a crest gauge and an ISCO automatic sampler while ST-6A, ST-6 and ST-7 will each have a crest gauge and bottle samplers.

Both the B and C Canyon drainages respond as ephemeral drainages, but baseline observations at ST-5 indicate that all of the flow comes from the B Canyon drainage, primarily the lower drainages and adjacent Mancos slopes. ST-6 and ST-6A are located, respectively, below and above the proposed mine site in C Canyon. The crest gauges did not record any flow in the channel during baseline monitoring in 1997 or 1998 even though the rain gauge in C Canyon recorded precipitation events of up to two inches during theat period. Based on monthly monitoring of ST-4 during 1997 and 1998, the applicant has determined that intermittent flow does not occur in the lower section of Bear Creek and that the channel responds only as an ephemeral drainage following substantial rainfall events.

If it becomes necessary to discharge water from the proposed mine, this water will discharge into the C Canyon drainage. In addition to being monitored at ST-5 and ST-6, discharged water will be subject to monthly monitoring stipulated by a UPDES permit. Because the monitoring required under the UPDES permit is more stringent and more frequent than that proposed in this permit application, discharge samples will be collected from the UPDES discharge monitoring point rather than at the drainage monitoring stations.

Acid and toxic-forming materials and underground development waste.

Data in Appendix 6-1 indicate that the potential for acid and/or toxic-forming material is minimal. No acid-forming materials or any toxic-forming materials have been identified or are suspected to exist in materials to be disturbed by mining (p. 7-12).

The applicant intends to produce a run-of-mine product without any coal-processing waste for disposal or on-site storage (p. 6-16). It is not likely that any significant amount of the roof, floor or coal material would be incorporated in the regraded fill material at the time of final reclamation. Coal will be stockpiled in a relatively contained area of the mineyard and all runoff from the site will flow to the sediment pond for containment (p. 6-8). Any waste rock generated through underground activities, such as construction of overcasts, will be permanently stored underground and therefore should not be a factor in surface reclamation activities (p. 6-7). Roof and floor materials will be permanently stored underground and will not brought to the surface for disposal. There will be no coal processing or coal preparation at the minesite. Prior to reclamation of the minesite, all coal will be removed from the minesite and sold (p. 7-27).

Hydrocarbons

The Spill Prevention and Control Countermeasure Plan is included in Appendix 5-6 and, it describes the steps to be taken to minimize disturbance to the hydrologic balance intended to meet applicable federal and Utah water quality laws and regulations regarding hydrocarbons. The applicant provides adequate

information about hydrocarbons used at the minesite from which the probable hydrologic impacts can be determined.

Other Chemicals

A commitment to handle and properly dispose of all noncoal mine waste defined as "hazardous" Under the Resource Conservation and Recovery act and 40 CFR part 261 is provided in section 528.33. Longwall mining fluid emergency spill plan is addressed and a list of chemicals to be used at the mine is included in section 731.300. Gravel areas will be sprayed with a chemical surface stabilizer such as potassium chloride, or water control (Chapter 4, pg 4-8). The applicant provides adequate information about chemicals used at the minesite from which the probable hydrologic impacts can be determined.

Transfer of wells

All water wells utilized during the operating phase will be abandoned in accordance with the rules outlined in "Administrative Rules For Water Well Drillers, State of Utah, Division of Water Rights, 1987". Closure of the wells will be conducted by a licensed well driller. The procedure is outlined on page 7-28.

Discharges into an underground mine

No discharge into the underground mine is anticipated (page 7-29). There is a possibility that water in the old Sunnyside Mine workings could be intercepted; this possibility will be greatly reduced, for economic and safety reasons, with careful surveying and exploratory drilling ahead of mining.

Gravity discharges from underground mines.

Surface entries and accesses to underground workings will be located and managed to prevent or control gravity discharge from the mine. All workings will dip away (downdip) from the portals. It is anticipated that the mine will be relatively dry but in the event that discharge becomes necessary, discharge will comply with the performance standards of the regulations and requirements of the UPDES permit before being discharged off the permit area (page 7-29).

Water-quality standards and effluent limitations

Sediment control measures have been designed to prevent, to the extent possible, additional contributions of sediment to stream flow or runoff outside the permit area, to meet effluent limitations and to minimize erosion (page 7-39).

The applicant will obtain a UPDES discharge permit to cover any possible discharge from the sediment pond (page 7-45).

Diversions.

Design Information

In a previous analyses the Division noted the permittee used smaller CN's than the Division felt was acceptable. Apparently, this resulted from differences in the Soil Hydrologic Group used in their analyses. In the PAP the applicant did not adjusted the Soil Hydrologic Group used to determine the CN but, did adjust the CN's. The applicant has included curve numbers that were agreed upon with the Division in a phone

conversation. The following table presents the hydrologic group provided from the Soil Conservation Service and the Hydrologic Group used by the permittee.

Soil Hydrologic Group

Soil (unit#)	Components	% Inclusion	SCS Hydrologic Group	Hydrologic Group used
Midfork Comodor Complex (62)	Midfork Bouldery Loam	50%	B	B
	Commodore Bouldery Loam	30%	D	
	Other	30%		
Rock Outcrop (96)	Rubble Land	30%	NA (impervious)	D
	Rock Outcrop	30%	NA (impervious)	
	Travessilla	25%	D	
	Other	10%		
Croydon (21)	Croydon Loam	100%	B	B
Beje-Trag Complex Plateaus (7)	Beje Loam	55%	D	C
	Trag Clay Loam	20%	C	
Beje Complex - Mountain Ridge Tops (5)	Beje very gravelly fine sandy loam	45%	D	C
	Beje fine sandy loam	35%	D	
	Other	20%		

Source: Soil Survey of Carbon County Area, Utah, USDA SCS June, 1988

The CN range presented below is determined acceptable by the Division and was determined from TR55 methodology with vegetative information provided in the plan and information from the Soil Survey of Carbon County Area, Utah, USDA SCS June, 1988. The CN range determined by the Division are presented, as well as, the CN provided by the operator.

Soil Hydrologic Group

Soil (unit#)	Divisions CN Acceptable Range	Permittee's Adjusted CN (previous CN)	Comments
Midfork Comodor Complex (62)	64 to 62	64 (59)	
Rock Outcrop (96)	80 to 89	80 (78)	Although this is at the low end of the CN acceptable range the Division agrees with the number provided.
Croydon (21)	50 to 60	59 (59)	
Beje-Trag Complex Plateaus (7)	72 to 80	70 (70)	The proposed CN was accepted because this soil type is a small percentage of the area contributing to runoff.
Beje Complex - Mountain Ridge Tops (5)	80 to 89	70 (70)	The proposed CN was accepted because this soil type is a small percentage of the area contributing to runoff.

Source: Soil Survey of Carbon County Area, Utah, USDA SCS June, 1988

Bypass Culvert

The Right Fork Undisturbed Bypass Culvert receives runoff from a 687.8 acre drainage area. This is greater than a square mile; therefore, by definition it is intermittent and it is required to be designed for a 100 yr - 6 hr precipitation event.

Design criteria and design certifications are provided in Appendix 7-4. The applicant uses the Office of Surface Mining Watershed Model, Storm Version 6.20 by Gary E. McIntosh to determine design flows and flow volumes. The SCS upland Curve is used to develop the time of concentration, and a forested unit hydrograph type is assumed for the undisturbed watersheds. Although the Kirpich Method for time of concentration results in a
more conservative design for the 100-yr 6-hr event (all other values held constant), the 50-yr 24-hr event used by the applicant for the bypass culvert design provides an additional capacity exceeding the values obtained using the Kirpich Method for time of concentration for the 100-yr 6-hr event.

The plan uses a CN of 0.020 for cmp culverts. According to Barfield, Warner and Haan, 1981 minimum values of 0.021 and maximum values of 0.025 can be used. If all other values provided by the applicant are held constant the 0.025 value used for the bypass culvert does not provide the capacity estimated for the 50-yr 24-hr event but, it would exceed the peak flow estimated from the 100-yr 6-hr event. In addition, the head created by up-gradient water will increase the volume that can move through the culvert when flowing full to adequately pass the estimated peak flow. The design flow for the 50-yr 24-hr event provided in the plan meets or exceeds the minimum regulatory requirements.

The outlet to the Bypass Culvert will be equipped with a rip-rap apron. Designs are included in Appendix 7-4. Undisturbed drainage culverts will have trash racks and, inlets will be protected with riprap. The designs meet or exceed minimum regulatory requirements.

Road Drainage

The disturbed area drainage is primarily developed along the roads and meet or exceed minimum regulatory requirements for road drainage. The road drainage diverted around the lower pad area is designed to be conveyed to the existing downstream channel beyond the permitted area.

Disturbed Area Drainage

Diversions are sized for the 10-yr 24-hr event using the SCS - TR55 method for Type II storms. The constructed ditch design will include an additional 0.5 foot of freeboard to the design flow depth.

A Manning's n equal to 0.035 is used for all ditch designs. This roughness factor is generally the value used for earthen channels that are small drainage ditches, stony beds with weeds on banks, earth bottom and rubble sides, or large drainage ditches with 4.0-5.0 hydraulic radius. Inspecting the channels under field conditions will ultimately determine design adequacy and erosional stability. Additional drainage may be needed in the pad areas if runoff is not adequately conveyed toward the road drainages. The information presented is designed to meet minimum regulatory requirements.

Stream buffer zones.

A commitment to provide buffer zone signs at the mine pad boundaries upstream and downstream along the right fork drainage is found in section 521.260. The August 1998 letter from the Division of Water Rights indicates no stream alteration permit is required, appendix 7-9.

The Division hereby authorizes mining and reclamation operations through the West Ridge C canyon drainage and finds that:

1) Coal mining and reclamation operations will not cause or contribute to the violation of applicable Utah or Federal Water Quality Standards and will not adversely affect the water quantity and quality or other environmental resources of the stream;

2) There will be a temporary stream channel diversion that complies with R645-301-742.300; and

3) The area not to be disturbed will be designated as a buffer zone, and the operator will mark it as specified in R645-301-521.260.

Sediment control measures.

General Construction plan

Information related to hydrology and sediment control issues identified in the plan include the following commitments for the construction phase:

- The first sediment control measures will be silt fence placed across the stream using the UDOT post and mesh method. Silt fences placed in drainages will include a notched spillway and, will not extend above the streambank elevation. Sediment control measures and drainage control for the early phases of construction are described in the following locations; chapter 5 (section 526.300), Appendix 5-5 (8b), and Appendix 7-4 (section 3.5).

- A sedimentation pond as a temporary measure is proposed to be in place prior to other construction activities (Appendix 7-4, section 3.5).

- The channel will first be culverted through the office pad/lower cell area. After the temporary sedimentation pond is installed construction can begin upstream. The dam embankment will be constructed 12 feet high and the culvert will be fitted with an open riser (Attachment 3, Appendix 5-5). This structure is estimated to be in place for approximately two months. A commitment to construct the pond under direction of a P.E. and, P.E. certification are provided (Appendix 7-4, section 3.5). **Due to the temporary nature the pond size is approved by the division according to R645-301-742.231.**

- Previous submittals proposed siltation structures would be removed from the discharge area surrounding the bypass culvert when flow can pass through the culvert, but could not be found in the recent submittal. The inspector should ensure that the structures are removed from the discharge zone when flow can pass through the culvert to function properly.

- When installing the Bypass Culvert the plan proposes using two methods to place fill. One, in Channel, Rock, Fill (CRF) areas, fill will simply be placed in the existing channel. Second, in Channel, Topsoil, Fill (CTF) areas, geotextile will be placed over the topsoil prior to placing the fill. The culvert will closely follow the existing channel alignment and grade.

  In Channel, Rock, Fill (CRF) areas the plan commits to the following in Appendix 5-5, "The channel bottom will not be graded or bulldozed, however." and "...small irregularities of less than 12 inches will be modified to accommodate the culvert alignment." Also, "Imported bedding material (borrow) will be used to fill minor depressions within the channel prior to installing the culvert." Large boulders will be moved away from the culvert alignment.

  Natural abrupt vertical gradient changes occur in the channel and were designated with the name "Rock Block" by the permittee. The plan commits to ramp the fill to the upstream gradient until the channel becomes level in order to retain these features for reclamation. This is an admirable effort to promote retaining the natural geomorphology of this canyon for channel reclamation.

  In Channel, Topsoil, Fill (CTF) areas the same techniques will be used as for the (CRF) areas. However, the channel banks and sides containing topsoil will be draped with the geotextile material before other construction occurs and the culvert bedding will be placed over the geotextile material followed by culvert placement.

- Once the culvert is constructed 500 feet up canyon from the temporary pond the permanent ponds can be constructed. When the permanent ponds are functional the temporary pond riser can be removed, the bypass culvert can be connected and the temporary pond will be filled (Appendix 7-4).

Top Soil Substitute Area.

This area is proposed to be utilized only if needed during final reclamation. Section 724.200 discusses utilizing silt fencing, roughening and final surface configuration. The applicant discusses insloping the site but, it is not clear what is intended by that statement. Creating a ponded area on the top of the pile may lead to gully erosion if the water can breaches the ponded area.

Alternate Sediment Control Measures

ASCA X and Y will use the following sediment control measures; pocking (also referred to as irregular pitted surfaces), silt fencing around the perimeter, seeding (following topsoil placement and after September 15), and constructing ditches at the base of the pad to convey runoff away from the topsoil stockpile and vegetative refrence ares (section 732.100).

Snow Removal

The PAP includes Map 7-2, Mine Site Drainage Map. The map shows numerous snow storage areas within the Mine site disturbed area perimeter. It is assumed that snow will be removed by regular blading and/or push-load/pickup-haul procedures.

There are no snow storage sites shown within the sediment pond (which is a two cell arrangement) incisements. Some snow will probably end up in the ponds due to side cast plowing; should this amount become excessive, a compliance problem may occur. Virtually all other snow melt will report to the sediment ponds via inlet diversions.

Snow removal stockpiles are shown on drainage map 7-4. Snow from areas other than the area draining to ASCA-Z can not be stockpiled in the ASCA-Z stockpile location because, the design does not consider treatment for runoff from snow beyond the alternate sediment control area. Snow from adjacent areas are therefore not approved to be stockpiled in ASCA-Z. Additionally, care should be conducted when grading the road crest at ASCA-Z to ensure the road drainage, not included in the design, does not enter the ASCA.

Siltation structures.

The siltation structures are sedimentation ponds. See the following discussion.

Sedimentation ponds.

Spillways

Two sedimentation ponds in series will be constructed at this site. The upper pond has an open channel spillway and will be constructed with a minimum 1.5 foot depth. The lower pond has two drop inlet spillways that will discharge to the bypass culvert, the primary spillway has a riser with an oil skimmer. The lower pond is designed with an emergency spillway and a primary spillway that will pass the 25-year, 6-hour storm event. Two feet of freeboard are designed between the emergency spillway (6938 ft) and embankment crest (1640). One foot of head is designed between the primary spillway 6937 ft and the emergency spillway 6938 ft. The primary spillway will carry the peak flow with 0.85 ft of head over the pipe. The plan meets minimum regulatory requirements.

The pond will be constructed with a walkway attached to the primary spillway (section 733.130) to allow for sampling discharged pond water.

Decant

Decanting the pond will be conducted by removal with a portable pump containing an inverted inlet and having a 100 gpm pumping capacity (Appendix 7-4 and section R645-301-742). The plan meets minimum regulatory requirements.

Pond Capacity

OPERATION PLAN

This pond is designed so the maximum extent the water can be impounded above the upstream toe is 16.5 ft (to the top of the primary spillway) in cell B. The pond contains less than 20 acre feet. Therefore the pond does not require MSHA approval.

The sedimentation pond design capacity is 7.67 acre feet at the pond spillway. The estimated run off volume 7.05 acre feet for a 10 year 24 hour event was determined but has some minor errors. First, a small addition error was noted in Table 4 regarding the runoff volume to the sedimentation pond. Second, runoff from the downstream portions from ASCA X and Y and adjacent watershed areas are not calculated in the pond and drainage designs. ASCA X and ASCA Y are shown in the plan with two construction options the second option reduces the mineyard area and if, implemented eliminates the error at ASCA X and ASCA Y. The excess pond volume and, the disturbed area which is delineated as extending beyond the proposed cut slopes, should provide a buffer and result in adequate pond capacity.

Pond areas used to determine the Pond Volume Curve were not verified. It is assumed the pond areas presented by the applicant in the pond volume curve are accurate. Sedimentation markers will be provided in both cells. The calculation for sediment yield appears to be estimated using a metric ton rather than a U.S. ton. The maximum sediment volume therefore, is slightly less than a 3 year estimate. The applicant has committed to clean out the pond at the 60% cleanout level and meets minimum requirements for sediment storage. The annual report survey will also track accumulations in the ponds.

Other treatment facilities.

No other treatment facilities are proposed for this site.

Exemptions for siltation structures.

No exemptions for siltation structures were requested or granted with this application.

Discharge structures.

Designs for the spillways in the upper cell is shown to be adequate to pass the 25-year, 6-hour peak flow. The peak flow from 10-year, 24-hour event should be passed to the lower ponds because the total pond volume is to contain the 10-year, 24-hour event. According to the calculations provided the spillway can pass the 10-year, 24-hour event at the 1 foot stage elevation.

Impoundments.

All impoundments are sedimentation ponds. See the discussion above.

Casing and sealing wells.

Sealing of the ground-water monitoring well and any future wells will comply with R645-301-748 (page 7-38). Upon completion of activities, the wells will be permanently sealed to prevent acid or toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance and to ensure safety when no longer utilized. Permanent closure of monitoring well DH 86-2 will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", July 15, 1987, State of Utah, Division of Water Rights. The well abandonment plan is on page 7-28. Any future water or monitoring wells will be abandoned in a similar manner (page 7-45).

Findings:

Hydrologic operation information provided in the PAP is considered adequate to meet the requirements of this section.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

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

Analyses:

All maps within the PAP show the incoming power line which will be owned and maintained by Utah Power and Light Company having a capacity of 46 KVA. Approximately 1200 feet of this line with its associated support structures will run inside the West Ridge Mine disturbed area perimeter. Upon reclamation of the site, the removal of the support structures and transmission line to the disturbed area perimeter will be accomplished as part of SMCRA's reclamation requirements.

The PAP addresses an agreement with Utah Power and Light which would allow West Ridge Resources the right to reclaim that portion of the Utah Power and Light transmission line which is within the West Ridge Mine disturbed area. Appendix 5-5, Attachment 3, consists of a letter from the utility to the applicant giving them the right to reclaim the power line down to the disturbed area perimeter. This will allow the recovery of the imported fill and the return of the drainage to its pre-mining configuration.

Findings:

The plan meets the minimum regulatory requirements for this section.

SIGNS AND MARKERS

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

Analyses:

Section 521.200 adequately addresses the specification requirements which must be met with regard to the signs and markers which must be posted at a permitted site. This minimum regulatory requirement has been met.

R645-301-521.260, Buffer Zone Markers, commits to placing a stream buffer zone marker in the right fork of the "C" Canyon drainage above the Mine yard disturbance. This meets the minimum regulatory requirements of R645-301-521.261.

Findings:

The plan meets the minimum regulatory requirements for this section.

USE OF EXPLOSIVES

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

Analyses:

R645-301-524.100, Blaster Certification, commits to using an individual having either initial surface blaster certification or recertification training to conduct all surface blasts incidental to underground mining.

R645-301-524.800, Compliance with Utah and Federal Explosive Use Laws and Regulations, commits to complying with all Utah and Federal laws and regulations concerning the use and storage of explosives.

Findings:

The plan meets the minimum regulatory requirements for this section.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analyses:

Affected Area Subsidence Maps

Map 5-7, Subsidence Map shows possible subsidence areas and also identifies subsidence monitoring stations (photogrammetric control points).

Affected Area Maps

The boundary of areas to be affected by mining is identified on numerous maps in the application. e.g. Map 5-5, Surface Facilities Map and Map 7-2, Mine Site Drainage Map.

Mining Facilities Maps

Map 5-5, Surface Facilities Map shows the surface area to be disturbed and the facilities that are to be installed for the mining operation.

Mine Workings Maps

The development of the West Ridge Mine will come within 350 feet of the #4 slope of the abandoned Sunnyside #1 Mine; development entries of certain panels will intercept and cross certain old workings of the same Mine. Although it is extremely doubtful that the water levels within the abandoned area have risen to the upper levels, these same works are more than likely filled with oxygen deficient atmosphere. As gate entries and bleeders are developed down dip, the necessity of accurate surveys will become paramount in

order to prevent unanticipated flooding. The possibility of intercepting large volumes of mine water through faults in the coal seam is obvious.

Sunnyside Coal Company closed in 1994 due to economic reasons; it is felt that sufficient Mine maps still exist which will accurately reflect the extent of the underground workings. It is hoped that the applicant will utilize these maps to avoid mine emergencies.

Monitoring and Sampling Location Maps.

Elevations and locations of monitoring stations to be used to gather operational data on water quality and quantity are shown on Map 7-7.

Certification Requirements

Cross sections, maps, and plans have been certified by a registered professional engineer.

Findings:

Maps, plans, and cross sections of operations information provided in the PAP are considered adequate to meet the requirements of this section.

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-545.

Analyses:

West Ridge Resources, Inc., has provided in section 515.300, the necessary commitment to notify the Division of any intent to cease or abandon mine operations for any period extending beyond 30 days. They commit to providing, a statement of the exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been in the permit area prior to cessation or abandonment, the extent and kind of reclamation of surface area which will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during the temporary cessation.

Findings:

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

RECLAMATION PLAN

LAND USE RECLAMATION PLAN

Regulatory Reference: R645-301-412

Analysis:

The applicant proposes no changes to the existing land uses. The application includes copies of comments from the Bureau of Land Management and the School and Institutional Trust Lands Administration supporting the proposed and current land uses.

Carbon County requires that the access road be left following mining, including that portion in the proposed permit area. In a letter dated August 14, 1998, the Bureau of Land Management said it acknowledges the road will be retained and finds this acceptable.

Findings:

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

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

Disturbed areas will be graded to achieve approximate original contour, and no variance from the requirements to restore approximate original contour is requested. The applicant does not intend to grade parts of the proposed disturbed area during construction but will simply place fill on them. Reclamation cross sections show only slight variations from original contour in a few areas.

Most slopes will be 2h:1v or less steep, but some areas near the highwall will be as steep as 1h:1v. Appendix 5-4 contains slope stability analyses for these areas. These are very steep slopes that would not normally be considered compatible with a postmining land use of grazing. However, since the existing slopes are similarly steep, the application is considered to meet regulatory requirements.

Findings:

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

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, 301-553, 302-230, -302-232, 302-233.

Analysis:

The backfilling and grading plan for final reclamation is located in Part II of Appendix 5.5. The summary of the backfilling and grading is as follows:

a. Remove Surface Structures
b. Remove Pad Cap Layer
c. Remove Excess Pad Fill
d. Remove Remaining Pad Fill; Backfill All Cutslopes
e. Reclaim Portal Highwall
f. Reapply Topsoil to Backfilled Cutslopes
g. Re-expose and Revitalize the Left-in-Place Topsoil
h. Re-establish the Original Rubbleland Surface

Remove Surface Structures

All coal handling facilities, buildings and ancillary structures will be hauled offsite. Materials which cannot be salvaged or recycled will be disposed of in an approved solid waste land fill.

Remove Pad Cap Layer

The Applicant and the Division assume that the top 6 inches of material in the disturbed area will become contaminated. The volume of contaminated material is estimated to be 3,722 cubic yards. During reclamation the material will be sent to ECDC to final disposal.

Remove Excess Pad Fill

During initial construction of the pad area some imported fill will be shipped onsite. Most of the material will be shipped offsite during final reclamation. The Division has approved the disposal of the excess fill material either by placing it underground or in a commercial borrow pit. The Applicant has approved from the landowner to ship the excess fill material back to the original borrow pit. The Division will calculate the reclamation bond on the assumption that the material will be shipped to a borrow pit or recycling.

The Applicant also has the option of disposing of excess fill underground. The coal rules do not specially address disposal of excess fill underground. However the coal rules do address disposal of coal mine waste underground (R634-301-536.520). Those rules require that the Applicant has MSHA approval. In the PAP the Applicant commits to compliance with MSHA regulations during that operation. Therefore, the Division approved the Applicant plan to dispose of excess fill underground.

Remove Remaining Pad Fill; Backfill All Cutslopes

The Applicant will restore the cut areas to the approximate original contours. All slopes will have a safety factor of at least 1.3. Since some reclaimed areas will have, steep slope topsoil may have to be placed concurrently with backfilling and grading.

Special consider will be given to disposal of the designated portal face-up material. This material was generated during initial construction when the portal highwall area was being excavated. Weathered and/or burned coal material from the outcrop coal seam was removed and stored in the mine pad fill in a non-structural area above the shop/warehouse facilities. During reclamation this portal face-up material will be uncovered and hauled back to the portal area. This material will be placed within the portals and/or adjacent to the portal highwall and then covered with at least four feet of backfill.

The backfilling and grading plan will meet the requirements of R645-301-553 that require the reclaimed area to achieve approximate original contour requirements and have a safety factor of 1.3.

Reclaim Portal Highwall

Special backfilling techniques will be applied at the portal highwall area, and also at the conveyor nose cut. Of the entire mine site, these are the areas that involve the steepest slope cuts. The pre-existing, pre-mining slopes in these areas are as much as 40° (i.e., nearly 1H:1V). During reclamation the portal area will be reclaimed to the approximate original contour. The highwall will be completely eliminated.

Reclamation of the highwall will be done by utilizing large boulders. Large angular boulders will be stacked one on top of another along the outer edge of the portal bench alone the toe of the slope. Fill slopes reinforced with large boulders in this manner can easily stand at the requisite 40° incline needed to reestablish the natural slope. The reclaimed slopes will be similar to existing slopes in the area appear to be stable over a long time.

The reclamation plan for the highwalls meets the requirements of R645-301-522 because the approximate original contours requirement will be achieved, the highwalls will be completely eliminated and the slopes will be stable.

Reapply Topsoil to Backfilled Cutslopes

Topsoil will be placed in the areas that were backfilled and regraded. The topsoil depth will vary from 12" to 18". The surface will be roughed with gouges consisting of imprinting the surface with a pattern of depressions measuring approximately 24" wide, 36" long and 18" deep. The purpose of these pocks is to capture and retain water and provide a cradle for seedlings. The backfilling and grading regulations in R645-301-553 do not have specific requirements for topsoil placement.

Re-expose and Revitalize the Left-in-Place Topsoil

Removal of the fill to re-expose the underlying original surface will result in the establishment of appropriate original contours in fill areas. Those areas will be reclaimed to the original contours and will have stable slopes.

Re-establish the Original Rubbleland Surface

Removal of the fill to re-expose the underlying original surface will result in the establishment of appropriate original contours in fill areas. Those areas will be reclaimed to the original contours and will have stable slopes.

Findings:

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

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analyses:

The Applicant committed to seal all portals according to MSHA and Division standards when mining permanently cess. During periods of temporary cessation the Applicant committed to secure the portals with gates and place signs warning the public of the dangers

The Applicant also commits to seal all other underground openings (monitoring wells) when no longer needed. The Division finds that the plans for temporary and permanent closure of all underground openings is adequate to protect the public and the environment.

Findings:

The Applicant met the minimum requirements of this section.

TOPSOIL AND SUBSOIL

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

Analysis:

Chapter 2, Soils, Sections R645-301-240 through -244, discusses the soil's reclamation plan for the proposed West Ridge Mine. The Analysis section discusses reclamation information as follows:

- Soil Redistribution
- Soil Nutrients and Amendments
- Soil Stabilization

Soil Redistribution

Reclamation sequence is shown on Map 5-12 and the sequence detail is explained in Appendix 5-5, Part II, for both cut slopes and buried soils. Section 2 gives a summary of the various area-types within the mine site and include (1) Channel or Slope, (2) Topsoil or Rock, and (3) Fill or Cut. Key reclamation tasks are summarized in Section 3 and detailed in Section 4 as follows:

4a) Remove Surface Structures
4b) Remove Pad Cap Layer
4c) Remove Excess Pad Fill
4d) Remove Remaining Pad Fill; Backfill All Cut Slopes
4e) Reclaim Portal Highwall
4f) Reapply Topsoil to Backfilled Cut Slopes
4g) Re-expose and Revitalize the Left-in-Place Topsoil
4h) Re-establish the Original Rubbleland Surface
4i) Sediment Control
4j) Vegetate the Newly Re-established Slopes
4k) Remove the Bypass Culvert/Re-establish the Original Stream Channel

The sequence for removing the pad fill areas and reclaiming the adjacent cut slope areas will be accomplished in reverse order from the construction sequence. The uppermost part of the fill (excess, imported fill) will be removed first hauled into the mine for underground disposal. The remaining native fill materials (primary native fills) located in the lower, deeper pad levels will be used to backfill the adjacent cut slopes to reach approximate original contour (AOC). Fill material will be inspected and tested to insure that it is free of salts, oil, petroleum products and any other contaminants before being used as backfill in the cut areas.

Co-mingling of native and imported fills will occur to a limited extent. Imported fill quality will be assured by previous testing . However, imported fills from the Himonas pit may contain elevated salts and are therefore not of equal quality to the native soils and fills. To diminish any negative environmental impacts to native soils and fills from salt contamination, the following efforts will be made to minimize co-mingling of the imported fills with native fills and soils:

- Imported fills will be tested to ensure compliance with DOGM guidelines.
- The interface boundary between the imported and native materials will be clearly marked during construction using flagging on an 8 foot grid. This marker boundary will serve as a visual reference for equipment operators and will make it easier to minimize co-mingling during final reclamation and removal of the imported fills.
- After imported fill has been removed, the top layer of native fill will be reclaimed first and placed as backfill in the deepest parts of the adjacent cutslopes. This upper layer of native fill is most likely to be co-mingled and impacted by imported fills. By being buried in the deepest parts of the cutslope, the potential effects of elevated salts will be negated for the purposes of final reclamation and revegetation.

Colluvial Growth Material (CGM) will be used to backfill and soil the cut slopes in the truck loop and coal storage areas.

Buried pad-fill boulders will be retrieved and placed back on the backfilled cut slopes.

Segregated stockpiled topsoil (Brycan and Midfork) will be retrieved and re-applied to their respective areas. Midfork soils will be replaced on the north facing slopes; Brycan soils will be replaced in the flatter, open confluence area. Replacement depth is 12 to 18 inches. After topsoil replacement, the soil surface will be roughened, gouged, mulched and revegetated.

Soil Nutrients and Amendments

Topsoil will be sampled and tested as they are redistributed and re-exposed. Fertilizer needs will be assessed based on analyses for soil nutrients. Nutrients and other amendments can be added by hydroseeding, by broadcasting or by other conventional methods.

Soil Stabilization

After AOC is met for each cut area, the surface will be prepared according to the roughen, vegetate and mulch method (R-V-M). Gouging will be the primary method used to roughen the surface and consists of imprinting the surface with a pattern of depressions measuring approximately 18" x 24" x 8" deep. The purpose of the pocks, or gouges, is to capture and retain water, reduce erosion and provide a cradle for seedling germination and development. Soils on steep slopes need to be protected from erosion prior to vegetation establishment. Soil erosion methods in addition to gouging will include best technology currently available at the time of reclamation (e.g., SOIL LOC®, Tackifier, etc.). Vegetation will be the primary source for erosion control and surface stabilization. Revegetation efforts will include regrading, topsoiling, fertilizing, mulching and seeding.

Reclamation Sequence Summary

Map 5-12, Reclamation Sequence, illustrates the different stages of reclamation for the West Ridge Mine site. Steps 1 through 5 show reclamation steps prior removing geotextile and reclaiming the original soil surface. Step 1 is removing cap layer and surface structures; Step 2 is removing excess imported pad fills; Step 3 is removing remaining native pad fill and backfilling cutslopes; Step 4 is replacing topsoil on re-established slopes; and Step 5 is relocating boulders on re-established slopes and preparing soiled surface for revegetation. Steps 6 through 7 show removal of geotextile, soil restoration steps and revegetation; Step 8 shows final culvert removal and restoration of Channel, which includes geotextile removal and re-exposure of the original soil surfaces while maintaining the geomorphology of the stream channel.

Findings:

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

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

The C Canyon County road will be retained as part of the postmining land use. The road will terminate at a public turnaround and will serve as permanent access to public lands in the area.. All other roads built by the mine will be removed and the area reclaimed according to the approved reclamation plan. The twin wheel jeep trail on top of West Ridge is an insignificant feature that will remain until nature reclaims same.

Findings:

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

HYDROLOGIC INFORMATION

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

Analysis:

The surface water and groundwater monitoring plans designate two stream monitoring sites on Grassy Trail Creek, seven springs (five in the Colton Formation and two in the North Horn Formation), and one well on the disturbed area site. The monitoring parameters and frequency are described and include the appropriate measurements. Included is the commitment to monitor these points "through reclamation until bond release."

Ground-water monitoring.

The operational monitoring program will continue through reclamation until bond release (Table 7-1). In order to comply with UDOGM directive Tech-004, baseline samples will be collected from each spring in the monitoring program during the low flow (fall) sampling beginning with the first mid-term review. This will be repeated every five years until reclamation is complete (p. 7-20).

Final abandonment of water monitoring well DH 86-2 (at the mine site) will be conducted prior to completion of final reclamation (page 7-28).

Surface-water monitoring.

The operational monitoring schedule will continue through reclamation until bond release (Table 7-1). In order to comply with UDOGM directive Tech-004, baseline samples will be collected from each stream monitoring site during low flow beginning with the first mid-term review. This will be repeated every five years until reclamation is complete (p. 7-20).

Acid and toxic-forming materials.

The determination of the PHC has not indicated that adverse impacts may occur to the hydrologic balance on or off the proposed permit area, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies. As a result there is no requirement for supplemental information.

No acid-forming materials or any toxic-forming materials have been identified or are suspected to exist in materials to be disturbed by mining (p. 7-10).

A major consideration in this project is that fill material brought in to construct the mine site pad will be tested and determined to be free of acid- and toxic-forming material. With the above considerations having been addressed, reclamation can be expected to be achieved with minimal concern for acid- and toxic-forming materials becoming a hydrologic problem.

Transfer of wells.

RECLAMATION PLAN

All water wells utilized during the operating phase will be abandoned in accordance with the rules outlined in "Administrative Rules For Water Well Drillers, State of Utah, Division of Water Rights, 1987". Closure of the wells will be conducted by a licensed well driller. The procedure is outlined on page 7-28. Any future water or monitoring wells will be abandoned in a similar manner (page 7-45).

Discharges into an underground mine.

No discharge into the underground mine is anticipated (page 7-29).

Gravity discharges from underground mines.

Surface entries and accesses to underground workings will be located and managed to prevent or control gravity discharge from the mine. All workings will dip away (downdip) from the portals. It is anticipated that the mine will be relatively dry but in the event that discharge becomes necessary, discharge will comply with the performance standards of the regulations and requirements of the UPDES permit before being discharged off the permit area (page 7-29).

Water quality standards and effluent limitations.

Water quality sampling and analyses have been and will be conducted according to the "Standard Methods for the Examination of Water and Wastewater" or EPA methods listed in 40 CFR Parts 136 and 434. Laboratory reporting sheets in Appendices 7-2 and 7-3 indicate the specific method that have used for each parameter.

The UPDES monitoring point on the lower sediment pond will be monitored until the pond is removed during reclamation. At that time the point discharge associated with water quality standards and effluent discharge will cease to exist and the only monitoring will be that associated with the surface water monitoring plan.

The surface water monitoring plan includes monitoring stations on the west slope of West Ridge and includes monitoring stations above and below the disturbed area. The plan covers sampling methods and parameters as discussed in the Operations Section of this Technical Analysis. The monitoring will continue through reclamation to bond release.

Diversions.

Upon reclamation of the site, the bypass culvert diversion is removed and the channel is restored to approximate original contour. The reclamation channels are appropriately designed for the 100-year, 6-hour storm and are appropriate for adequate reclamation. Considerable effort has been devoted to developing a Construction/Reclamation Plan, Appendix 5-5. This includes stream channel reclamation. The overall plan is discussed in the Sediment Controls Measures section below.

On pages 5-48 and 7-36 a commitment is made to construct a turnaround at the end of the county road during reclamation. The Mine Site Reclamation Map, M 5-9 shows this turnaround. The county road and road turnaround will be the only structures left after reclamation of the site.

Stream buffer zones.

As with the construction phase of this project, the reclamation phase will involve construction activities within 100 feet of the ephemeral stream. In fact, the very stream bed will be filled in to create the

mine site pads. The Division has authorized these activities in issuing the mining permit. During the reclamation phase, stream buffer zones will not be appropriate as the stream itself is being restored. As such, stream buffer zones do not apply during reclamation.

Sediment control measures.

The reclamation plan provides considerable details regarding the construction/reclamation sequence and methods. These are explained in Appendix 5-5, Construction/Reclamation Plan and on Map 5-11, Construction Sequence, Map 5-12, Reclamation Sequence, Map 5-9, Mine Site Reclamation, and Map 5-10, Construction/Reclamation Area-Types.

During reclamation the primary sediment control mechanism is the roughening and pocking of the site to prepare the soil for amendments and seeding. There is also a mixing of mulch into the soil. Also reference App. 7-4, page 59. The pocking will be about two feet by three feet by 18 inches deep. This method of sediment control and reclamation of a minesite disturbed area has been used successfully at several mine sites in the state and is expected to work at Westridge. Gradual filling of the pocking occurs while vegetation is reestablished.

Calculations are included in Appendix 7-4, page 59, showing a comparison of the total sediment loads in the Reclaimed State as compared to the Undisturbed State anticipated at the site. These show that the yield of the Reclaimed State would be about one-half that of the Undisturbed State. Sediment loads of 0.0013 tons/year compared to 0.0027 tons/year. This seems somewhat optimistic, based on the parameters selected for use in the USLE equation. However, the point is made that the sediment load will be less with the proposed roughening method than the canyon in its natural state.

In order to minimize sediment inflow to the stream, the reclamation plan uses silt fences along the slope contours, roughly parallel to the stream. These are used on both sides of the ephemeral streams and are staggered to prevent rill formation. Fences are located in areas of longest and steepest slopes. The plan commits to clean out the fences when they reach midpoint of the fence. Map 5-9, Mine Site Reclamation shows the locations of the fences.

Table 5-1, Reclamation Timetable indicates one week between "recontouring & reestablish fill slopes" and "reseed/mulch/revegetate" which is the time period during which top soils are spread and left open to rainfall before they are seeded and protected from erosion. This an appropriate time lapse. The other elements on the timetable appear appropriately timed. The reclamation operation is an ongoing process starting at the top of the canyon and proceeding down the canyon to the lowest point. This will keep from working over reclaimed areas.

During reclamation of the largest part of the disturbed area, the lowest cell of the sediment ponds complex will be left in place providing sediment control at the downstream end of the site. This should protect the entire site to the greatest extent possible. When the culvert is removed, the sediment pond is of no use and there are to be three silt fences installed in the stream at the lowest elevation at the lower end of the site to control sediment from getting off the site. See the Sedimentation Ponds section below for details of the ponds removal.

These methods appear adequate to achieve a successful reclamation with minimal sediment problems. The fact that this is an ephemeral stream makes the risk low also.

Siltation structures.

The only siltation structures in the project are the two sediment ponds in series. Their operation and reclamation is discussed under Sedimentation Ponds.

Sedimentation ponds.

Reference Appendix 5-5, Construction/Reclamation Plan. Primary sediment control during reclamation will be the sediment ponds located at the lower end of the site. The ponds will be left in place during the largest part of site reclamation until the very final stages of the process. As the ponds are removed this will be done from the upper cell to the lower cell. The lower cell will be left until the last part, that is, culvert removal. During removal of the last sediment pond and the area below it, temporary sediment control will be provided by silt fences across the downstream end of the disturbed area. These will provide a last line of sediment control during culvert and lowest sediment pond removal. The sediment ponds will be completely removed at the end of reclamation. These methods appear adequate to achieve a successful reclamation with minimal sediment problems. The fact that this is an ephemeral stream makes the risk low also.

Other treatment facilities.

There are no other treatment facilities in this project.

Exemptions for siltation structures.

The office pad below the lowest sediment pond is the only alternate sediment control area during reclamation. It will be removed similar to the other mine site pads with sediment control being provided by silt fences downstream of the toe area. In addition there will be substantial silt fences across the canyon stream at the lowest end of the site.

Discharge structures.

During the Operation Phase, stream protection at the outlet of the main canyon bypass culvert will be a riprap energy dissipator which will slow the exit velocity of the water leaving the culvert. Appendix 7-4, pg.11, details the design which shows water leaving the dissipator to be about half that of the natural velocity of water in the channel for the same flow volume. The design is based on the appropriate 100-year, 6-hour event and appears to be adequate for the intended purposes.

At reclamation the entire site bypass culvert is removed, including the energy dissipating riprap at the outlet. The channel is regraded to approximate original contour and no discharge structures are left.

Impoundments.

The only impoundments in the project are the two sediment ponds in series. Their operation and reclamation is discussed under Sedimentation Ponds.

Casing and sealing of wells.

Sealing of wells will comply with R645-301-748 (page 7-38). Upon completion of activities, wells will be permanently sealed to prevent acid or toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance and to ensure safety when no longer utilized (p. 7-45). Permanent closure of monitoring well DH 86-2 will be in accordance with the requirements of

"Administrative Rules for Water Well Drillers", July 15, 1987, State of Utah, Division of Water Rights (p. 7-48). Well abandonment plans are on pages 7-28 and 7-48.

Findings:

Hydrologic reclamation information provided in the PAP is considered adequate to meet the requirements of this section.

REVEGETATION

Regulatory Reference: R645-301-341

Analysis:

Revegetation Plan

The revegetation plan is primarily in Section R645-301-341. Three revegetation scenarios are shown, one for areas where topsoil would be salvaged and redistributed, one for areas with topsoil that is covered with a geotextile, and one for rock/rubbleland areas. In the rock/rubbleland areas, there are a few areas where topsoil would be salvaged and later replaced.

Once the site is prepared by grading and replacing topsoil, removing fill (rock/rubbleland), or removing fill and the geotextile (experimental practice area), the same revegetation techniques will be used for the entire area. This sequence is:

1. A weed-free alfalfa hay mulch would be applied at the rate of 2000 pounds per acre, and fertilizer would be added if deemed necessary.

2. The surface will be gouged. In this process, the alfalfa and fertilizer will be mixed into the soil and the soil will be roughened.

3. The seed mix will be broadcast seeded or hydroseeded.

4. The area will be mulched with 2000 pounds per acre of straw, and a wood fiber mulch and tackifier will be applied.

Seeding will be done as soon after regrading as possible but prior to the end of October. According to the timetable in Table 5-1, some seeding could occur as early as June. Seeding this early should be avoided as much as possible, but it is more important to seed before the soil has a chance to crust than to wait until later in the year. As experience is gained at other nearby mine sites, it may become necessary to change the seeding schedule.

The applicant has committed to place large rocks on regraded areas to increase landscape diversity. In addition to making the site look more natural, these will serve as wildlife habitat and provide a greater diversity of sites for different plant species. They create localized areas of concentrated runoff and cooler temperatures where species can become established that would not survive if the site was uniform.

RECLAMATION PLAN

The seed mixes to be used in final reclamation are in Tables 3-2A, B, C, and D. No introduced species are included in these mixtures, and winterfat has been added at the suggestion of the Division of Wildlife Resources.

The applicant has included several species encountered in vegetation sampling that should increase vegetation diversity of the revegetated areas. Seed of all these species is available commercially, but some must be hand-collected.

The applicant has collected seed of canyon sweetvetch and will plant most of this seed on the topsoil pile(s) for the purpose of propagating seed that can be used for final reclamation. Some seed will not be planted in case the initial revegetation efforts fail. Canyon sweetvetch grows well on disturbed sites, and it should grow well in reclaimed areas.

Douglas fir would be planted in Douglas fir/Rocky Mountain juniper areas both from seed and transplants. Since Douglas fir is a common tree grown for timber, it is likely that plants inoculated with ectomycorrhizae are available commercially, and the applicant has committed to attempt to use inoculated plants.

Studies have documented that populations of microorganisms in stockpiled soil decrease with time and depth in the stockpile. At the West Ridge Mine, soil that is stockpiled or under fill is likely to have very few living microorganisms when the mine is reclaimed. In addition, cover from cryptogams, including liverworts, mosses, lichens, and cyanobacteria, will be destroyed.

Most perennial plants form symbiotic relationships with various species of fungi that allow the plants to take up more water and nutrients from the soil. This allows them to better compete with non-mycorrhizal species, especially weeds. Moreover, there is evidence that cryptogams decrease soil erosion and increase the amounts of some nutrients in the soil.

Cryptogams have not traditionally been considered "vegetation" that is required for bond release; however, they may be important for other reasons. Soil inoculation to try to establish cryptogams and vesicular arbuscular mycorrhizae has been tried in a few areas, but there has been little work on coal mines in Utah. Because the efficacy of inoculation is not known, the applicant has not proposed it as a technique to be used in final reclamation but has proposed to use a commercially available soil activator in the test plots. Test plot results will be used to modify the mining and reclamation plan. If the soil activation or other techniques used in the test plots are not as successful as needed, it would be possible to attempt to culture microorganisms in a greenhouse. The Division is unaware of instances were this has been tried on a large scale, so this method is not being required at this time.

The applicant does not intend to irrigate but, instead, will use water harvesting methods. Irrigation should not be necessary at this site.

Pesticides will only be used if a problem is identified and spraying is deemed necessary to control damage to reclamation. The area does not have heavy infestations of noxious weeds, so it is not anticipated herbicides will be needed. The use of other pesticides would depend on what problems are encountered, but none are foreseen.

In Sections 341.300 and 342.100, the application indicates native species have become reestablished in disturbed areas without seed or mulch application or surface preparation. While the Division does not know precisely what reclamation efforts have been undertaken in this area, there are stands of introduced

grasses that have the appearance of having been seeded. Nearby sites with less precipitation, such as Horse Canyon, have had good revegetation success.

The mine site poses certain challenges for reclamation, but considering the soils, climate, the revegetation plan, and other factors, the Division considers the probability of reclamation success to be high. The application includes revegetation techniques that have been tried and proven successful at area mines with similar conditions.

When reclamation begins in the experimental practice area, it is expected that soil will be compacted and essentially devoid of microbial activity. Adding alfalfa hay and gouging should adequately alleviate the compaction.

The proposed disturbed area is relatively narrow with sources of soil organisms that could colonize the nearby disturbed area. Division representatives have seen cryptogamic soil crusts beginning to form in a topsoil borrow area not far from the proposed West Ridge Mine after only eight years. Therefore, it is expected that inoculation will occur naturally. However, the applicant has committed to modify the plan to include a soil activation or inoculation method in the reclamation plan if the test plot results indicate it is needed. Considering these factors, it appears likely microorganisms will be reestablished quickly and that vascular plants can then benefit from them.

Revegetation Success Standards

As discussed in the vegetation information section, there are few differences between the reference areas and the proposed disturbed areas. Using untransformed data, the only significant difference where the proposed reference area has less cover than the proposed disturbed area is in the Rocky Mountain juniper/Douglas fir community. The vegetative cover values were statistically different at 90% but not at 95% confidence. Constructing a 90% confidence interval allows 66.53% cover, and the actual value is 66.00%. However, if one performs a natural logarithm transformation of the data, there is no statistical difference.

Every other aspect of the proposed reference and disturbed areas in the Rocky Mountain juniper/Douglas fir community is the same or very similar, including species composition, aspect, slope, soils, productivity, and range condition. Because of the many similarities, the Division feels the proposed reference area is an acceptable standard.

The Douglas fir/maple reference area is shown on Map 3-1, and quantitative information is included in Appendix 3-1A. Woody plant density and vegetative cover are not statistically different in the proposed reference and disturbed areas; however, the proposed reference area appears to have greater diversity. While achieving this standard may present difficulties, it should be possible to attain the standard using the reclamation plan the applicant has proposed.

The sage/grass and pinyon/juniper proposed disturbed and reference areas are, for the most part, very similar. As discussed in the Vegetation Resource Information section of this review, the proposed pinyon/juniper reference area has greater cover than the proposed disturbed pinyon/juniper community in the potential borrow area; however, because the standard is higher than what currently exists at the site, the application is more stringent than the regulations.

Diversity will be measured using MacArthur's diversity index. The application gives a brief discussion of this index, and it is an acceptable means of measuring diversity. The standard would be that the index for disturbed areas would need to be at least 90% of the index for the reclaimed area. This is a

satisfactory standard, but at the time of final reclamation, the Division and the applicant may find it difficult to achieve and too inflexible. If the applicant is unable to meet this standard during final reclamation, the Division should examine current rules and decide if a different standard would be more applicable based on both current conditions at the time and the baseline information.

Erosion control would be judged using the "Erosion Condition Classification System" originally developed by the Bureau of Land Management and modified by the Office of Surface Mining. Reclamation would be considered successful if soil surface factor values were the same as or lower in the reclaimed areas as in adjacent undisturbed areas.

With the exception of one succulent and one stonecrop species, it appears all species encountered in vegetation sampling are cool season. The two CAM species are relatively insignificant and are not desirable; therefore, the only standard needed for seasonality is that all plants would be cool season. This should be easy to achieve since the warm season plants are normally more difficult to establish.

For areas with a postmining land use of wildlife habitat, the Division is required to consult with State wildlife agencies and gain approval for tree and shrub establishment success standards. The Division has consulted with the Division of Wildlife Resources and developed standards, and these have been included in the application. The standards are based primarily on existing conditions and take into account the species that contribute to the woody plant densities in the various areas. In the sagebrush/grass area, the numbers of woody plants in both the proposed disturbed and reference areas are considered excessive, so the standard is lower than the number currently existing at the site. The established standards are included in the application.

Table 3-4 of the application is a revegetation monitoring schedule. Qualitative observations would be done every year after seeding, but quantitative observations would be done only in the years specified. The monitoring schedule is considered adequate.

Field Trials

Section 341.300 has a brief description of the plan for test plots, but a more detailed description is in Appendix 2-6. The test plots will be established in an areas upstream from the topsoil stockpile in the right fork. As in the experimental practice, soil will not be salvaged from the west half of the test plot area. First, geotextile will be placed in the west half of the test plot area with the culvert and fill material placed on top of the geotextile. Next, topsoil will be salvaged from the two different soil types in the east half of the test plot area and placed separately on the fill on the west side of the test plot area. Geotextile will then be placed on the northeast portion of the test plot area (Strych soil) and the culvert extended through this area. Cut material from the southeast portion of the test plot area from which Midfork topsoil had previously been salvaged will be placed on top of the culvert. Finally, the test plot topsoil stockpiles on the west side of the test plot area and the cut and fill on the east half will be seeded with the interim seed mix.

After five years, the test plot area will be reclaimed. First, fill over the culvert in the east side of the area will be placed in the cut in the southeast part of the area (Midfork soil area) and the culvert removed. Next, soil will be replaced in the east half of the area. Fill material and the culvert in the west half of the area will then be removed and the culvert headwall relocated downstream just above the topsoil stockpile. Finally, revegetation treatments will be applied in the same manner as at final reclamation except that a soil activator may be used.

The test plot area will be accessed via the extreme edge of the topsoil stockpile and the adjacent cutslope during late summer or early fall. Any compaction or disturbance to the stockpile surface will be ripped and reseeded following completion of the test plot installation and reclamation of this area.

Monitoring will proceed for five years or until a determination of success has been made and will compare the test plots with each other and with the Douglas fir/maple reference area. If the results show a need to revise the revegetation plan, the applicant will work with the Division to amend the plan and incorporate needed changes.

Table 3-4 shows a monitoring schedule that includes quantitative observations over the five-year period. Using cover measurements, it will be possible to compare vegetation diversity in the different areas.

The methods in the test plot designs closely simulate the construction and reclamation sequence in the application although on a much smaller scale. While the test plots do not include revegetation of rock rubbleland areas, the same principles apply; very similar conditions will prevail in rock rubbleland areas compared to the test plots. Therefore, these test plots will allow the Division to adequately evaluate whether revegetation is likely to be successful in the entire area.

Wildlife Habitat

Plant species in the seed and planting mixtures were selected on the basis of forage nutrition and cover values and adaptability to the environment. While the species in the seed mixtures are not all identical to those currently existing on the site, they are similar and should enhance the value of vegetation for wildlife. Rocks to be used in reclamation will also create wildlife habitat although it will not be to the degree that currently exists on the site.

Appendix 3-6 contains comments from the Division of Wildlife Resources about the application. The comments primarily concern updating basic wildlife information, but there is also a suggestion to add winterfat to the seed mixture. The comments have been addressed, and, based on conversations with Wildlife Resources personnel, it does not appear additional enhancement measures will be needed. Wildlife Resources personnel have indicated they are pleased with the seed mixtures.

The applicant intends to do off-site mitigation in the form of either shrub plantings or installation of a guzzler. According to the application, Wildlife Resources and the BLM are supportive of these options, and the applicant is working with these two agencies on plans for the mitigation. An outline of mitigation measures will need to be included in the application when they are finalized.

Findings:

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

STABILIZATION OF SURFACE AREAS

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

Analyses:

After AOC is met for each cut area, the surface will be prepared according to the roughen, vegetate and mulch method (R-V-M). Gouging will be the primary method used to roughen the surface and consists of imprinting the surface with a pattern of depressions measuring approximately 18" x 24" x 8" deep. The purpose of the pocks, or gouges, is to capture and retain water, reduce erosion and provide a cradle for seedling germination and development. Soils on steep slopes need to be protected from erosion prior to vegetation establishment. Soil erosion methods in addition to gouging will include best technology currently available at the time of reclamation (e.g., SOIL LOC®, Tackifier, etc.). Vegetation will be the primary source for erosion control and surface stabilization. Revegetation efforts will include regrading, topsoiling, fertilizing, mulching and seeding.

Findings:

The information provided meets the regulatory requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: R645-301-526.200, R645-301-541.300

Analysis:

Affected Area Maps

Map 5-9, Mine Site Reclamation identifies the area that will be affected by reclamation treatments upon completion of mining.

Reclamation Backfilling and Grading Maps

The operator has supplied an excellent map which identifies areas to be backfilled and graded and allows the viewer to visualize the quantities involved. This is map 5-10, Construction/Reclamation Area - Types.

Final Surface Configuration AOC Maps

Plate 5-9, Mine Site Reclamation map shows the final surface contours.

Reclamation Surface and Subsurface Manmade Features

The applicant has revised page 5-50 of the PAP (9/9/98), referring to Map 5-9, which shows that portion of the Carbon County road which is within the Mine permit area, and will remain as access for the applied for post mining land use. The twin wheel jeep trail on top of West Ridge is an insignificant feature that will remain until nature reclaims same. The applicant has met the minimum regulatory requirements of 542.320.

At this point, the PAP does not state which, if any, man-made utility features will be left in place within the Mine's permit area; this requirement can be a stipulation of the mid-term or five year permit renewal process as necessary. This map, as required by R645-301-542.320 is not necessary for approval of the PAP. Mid-term reviews and five year permit renewals can require that this map be submitted as the area develops; this will meet the intent of the R645 requirement.

Reclamation monitoring and sampling location maps.

Baseline monitoring will be performed until construction of the mine and mine facilities begins. Once construction is initiated, the operational monitoring schedule will be utilized. Monitoring will continue through reclamation until bond release (Table 7-1). Locations are shown on Map 7-7.

Certification Requirements

Cross sections, maps, and plans have been certified by a registered professional engineer.

Findings:

Maps, plans, and cross sections of reclamation information provided in the PAP are considered adequate to meet the requirements of this section.

BONDING AND INSURANCE REQUIREMENTS

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

Analyses:

Form of bond. (Reclamation Agreement)

The Division can approve the permit before the reclamation bond has been posted or the reclamation agreement signed. However, prior to the Division issuing the permit, the Applicant must post a bond that meets the requirements of R645-301-800.

Determination of bond amount.

Information provided in the plan is adequate to allow the Division to calculate the required bond amount. In February 1999, the Division estimated the cost for the Division to reclaim the West Ridge Mine to be $2,117,000 in 2004 dollars. The Division used the general reclamation plan in the PAP (Section R645-301-540 to R645-301-560) Appendix 5-1 Reclamation Bond Calculations and Appendix 5-5 West Ridge Mine Construction and Reclamation Plan, Means Heavy Construction Cost Data 13th Edit, Blue Book Rental Rates, and the Caterpillar Performance Handbook 29th Edition to calculate the reclamation cost estimate. The Division escalated the reclamation cost to the year 2004.

The Division can approve the PAP without a reclamation bond being posted. However, prior to the permit being issued the Applicant must post the reclamation bond.

Terms and conditions for liability insurance.

A cetificate of insurance showing appropriate coverage has been provided in Appendix 1-1.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section. However, prior to permit issuance, the permittee must provide the following in accordance with:

R645-301-800, The Applicant must give the Division a signed reclamation agreement, and post a reclamation bond, no less than $2,117,000 and show proof of insurance.

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

EXPERIMENTAL PRACTICES

Regulatory Reference: 30 CFR Sec. 785.13; R645-302-210, -302-211, -302-212, -302-213, -302-214, -302-215, -302-216, -302-217, -302-218.

Analysis:

Chapter 2, Soils, incorporates traditional methods of salvaging/stockpiling and an Experimental Practice method for protecting soils in-place. The **Experimental Practice** is unique by taking a **Reclamation Approach** for topsoil protection.

Operations - Experimental Practices

Appendix 2-6, West Ridge Mine Experimental Practice In-Place Topsoil Protection, details protecting topsoil resources in-place for (1) buried topsoil areas, and (2) buried RO/RL (rock outcrop/rubbleland) Travessilla Complex soil area. These two combined areas account for 16.75 acres of the total 29 acres of disturbed area.

(1) Buried Topsoil Areas

West Ridge Resources is proposing a topsoil protection plan which incorporates **Experimental Practices (R645-302-200) for protecting in-place soil with a layer of geotextile fabric.** The geotextile fabric provides a protective barrier between the existing soils and the imported fill materials used to construct the mine pads. By utilizing this procedure, soils are not only preserved in-place, but the existing stream channel geomorphology and original ground surface configuration are preserved likewise. Approximately 4.75 acres of the proposed 29-acre disturbed area will be affected using the geotextile fabric.

(2) Buried RO/RL Travessilla Complex Areas

The buried RO/RL Travessilla Complex mapping unit will be included in the Experimental Practices. As stated in the Order-III soil survey, the RO/RL Travessilla Complex unit contains 35% soils by volume (25% Travessilla plus 10% other soils) that support a significant vegetation community. Successful reclamation requires the same soil and rock parameters that currently exist to establish revegetation success standards. By preserving these soils in-place underneath the pad fills, successful revegetation should be achieved. Placing the RO/RL Travessilla Complex mapping unit under Experimental Practices will not require the use of geotextile fabric. As stated in the plan, the RO/RL areas will not be covered with geotextile, but instead, fill will be placed directly over the existing ground surface which will be marked with brightly colored marker flagging strips placed on 8-foot centers for the purpose of identifying the original surface during reclamation and excavation of the pad fills. Marker strips will be used on approximately 12 of the 29 acres of the disturbed area.

Construction Sequence

Map 5-11, Construction Sequence, illustrates the different stages of construction for the West Ridge Mine site. Steps 2 and 3 illustrate the Experimental Practice steps for installing geotextile fabric and marker strips. Construction sequence steps are outlined as follows:

- Steps 1 through 4 are preparatory steps prior to topsoil salvage. Step 1 is removing vegetation; Step 2 is installing culvert and culvert backfill while placing geotextile in channel bottom and placing marker strips in RO/RL areas; Step 3 is installing geotextile fabric over topsoil fill slopes, and placing marker strips in RO/RL areas; and Step 4 is pulling boulders from the surface of slopes that will be cut. Topsoil salvage occurs in Step 5. After topsoil salvage has occurred from the topsoil area and RO/RL areas, excavation of the side slopes will occur in Step 6. These excavated native materials will be used as pad fill and will be placed over the backfilled culvert adjacent to the cut slopes. Step 7 shows completion of the pad level by hauling in imported fill from offsite, commercial gravel borrow areas. A final cap layer of road base material is placed over the imported fill surface as shown in Step 8.

Reclamation - Experimental Practices

During fill removal, a 12- to 18-inch deep working layer will be left over the Experimental Practice slopes. Care will be taken not to subexcavate or disturb the geotextile soil surfaces. Equal care will be taken to protect the "ribbon" surfaces in the RO/RL areas. Fill removal from the slopes will be done carefully without disturbing the in-place soils located under the geotextile and marker strips. Fill removal will be done by small earth moving equipment and/or by hand labor if necessary to minimize disturbance of the topsoil. After the pad fill has been removed, the backfilled culvert will serve as the primary access way for machinery and materials associated with the remaining reclamation efforts.

Once the geotextile fabric has been exposed, the fabric will be carefully peeled away from the soil and the condition of the underlying soil materials observed at this time. The soil will be re-exposed in 5-10 foot horizontal zones that can be easily accessed and worked by hand from the adjacent pad fill level.

In RO/RL fill areas, fill will be removed down to the original, undisturbed surface as delineated by the marker strips. Because of the roughness of the ground surface, pad fill be removed to the extent possible.

To relieve soil compaction and increase the ability of the soil to absorb moisture, the re-exposed soil surface will be gouged and hay worked into the soil at the rate of 2,000 pounds per acre. Gouging depressions will approximately measure 24" X 36" X 18" deep and will create a pattern of depressions that help control erosion through water retention, minimize siltation, and allow for air and water penetration into the soil horizon.

Reclamation Sequence

Map 5-12, Reclamation Sequence, illustrates the different stages of reclamation for the West Ridge Mine site. Steps 3 through 8 illustrate all Experimental Practice steps involved with reclamation for removing fill, restoring buried soils and reclaiming the original soil surface. Reclamation sequence steps are outlined as follows:

- Steps 1 through 5 show reclamation steps prior removing geotextile and reclaiming the original soil surface. Step 1 is removing cap layer and surface structures; Step 2 is removing excess imported pad fills; Step 3 is removing remaining native pad fill and backfilling cutslopes; Step 4 is replacing topsoil on re-established slopes; and Step 5 is relocating

boulders on re-established slopes and preparing soiled surface for revegetation. Steps 6 through 7 show removal of geotextile, soil restoration steps and revegetation; Step 8 shows final culvert removal and restoration of Channel, which includes geotextile removal and re-exposure of the original soil surfaces while maintaining the geomorphology of the stream channel.

Field Trials

In order to evaluate the effects of the geotextile and fill over the existing in-place topsoil resources, a test plot study area will be established in the upper right fork northeast of the topsoil stockpile. The purpose for the test plots is to evaluate the Experimental Practice reclamation plan proposed for the mine yard area.

The test plots will be established in an areas upstream from the topsoil stockpile in the right fork. As in the Experimental Practice, soil will not be salvaged from the west half of the test plot area. First, geotextile will be placed in the west half of the test plot area with the culvert and fill material placed on top of the geotextile in the same sequence and manner as used in the mine yard construction. Next, topsoil will be salvaged from the two different soil types in the east half of the test plot area and placed separately on the fill on the west side of the test plot area. Geotextile will then be placed on the northeast portion of the test plot area where soil was stripped (Strych soil) and the culvert extended through this area. Cut material from the southeast portion of the test plot area from which Midfork topsoil had previously been salvaged will be placed on top of the culvert. Finally, the test plot topsoil stockpiles on the west side of the test plot area and the cut and fill on the east half will be seeded with the interim seed mix.

After the test plot area is constructed, the cut/fill area will remain intact for five years to simulate the operation phase of the mine yard. Following the five year period, reclamation will be performed on the test plot area to actually implement and test the final reclamation plan in comparison to conventional reclamation techniques. Appendix 2-6 contains a complete discussion of the Experimental Practice test plot plan.

The resulting four test plots will be grouped into two categories, the "removed topsoil test plot" and the "in-place topsoil test plot". One portion of the test plot area could be treated/inoculated with a commercially available soil activator designed for revitalizing soil in order to evaluate whether inoculating the topsoil promotes faster or more diverse revegetation. Although this is not currently being proposed in the final reclamation plan, it could be used to assist vegetation establishment in the geotextile area at the time of final reclamation.

After the surface treatments have been applied, the plots will be seeded with the final reclamation seed mix. Canyon sweetvetch will also be seeded on the test plots. Because of the small area to be treated (about 0.31 acre), the seed will be broadcast on the surface and raked in by hand. Straw mulch will be applied over the seed bed of the test plot at a rate of 2,000 pounds per acre. Then the surface will be sprayed with a mulch and tackifier.

The test plot area will be accessed via the extreme edge of the topsoil stockpile and the adjacent cutslope during late summer or early fall. Any compaction or disturbance to the stockpile surface will be ripped and reseeded following completion of the test plot installation and reclamation of this area.

Vegetation monitoring will compare the results of plant growth between the Experimental Practice in-place soils to replaced topsoil. Monitoring will compare re-vegetation response for each soil type (Strych and Midfork) for each of the two soil surfaces (channel bottom and hillside). For example, comparisons will be made between in-place soils and replaced soils for the channel bottom soils consisting mainly of Strych; likewise, comparisons will be made for hillside Midfork soils. The experimental test plot area will also be

compared with the reference area for the Douglas Fir/Maple vegetation type. Vegetation will be monitored for five years or until a determination of success has been made for the Experimental Practice. WEST RIDGE Resources will consult closely with the Division regarding the results of the test plot study. Should the results show a need to revise the reclamation plan, WEST RIDGE Resources will work with the Division to amend the plan and incorporate the changes needed to ensure reclamation of the mine yard area will be successful. As a last resort, West Ridge Resources will utilize the soil borrow area for obtaining soils to reclaim the site if the Experimental Practice is determined to be unworkable.

Analysis of the Proposed Experimental Practice

The Utah State soils regulations (R645-301-200) are intended to protect and preserve topsoil resources for the purpose of revegetation, thus providing a stable surface capable of supporting the postmining land use. The proposed Experimental Practice, including operation and reclamation procedures, provides soil resource protection equal to or greater than what would be obtained through traditional methods of salvaging and stockpiling as required in the Utah State soil's regulations. The Division has analyzed the proposed Experimental Practice for preserving topsoil resources in-place with respect and in relation to the State's regulatory obligations, and the applicant has adequately addressed each of these requirements. The following discussion gives an analysis of the proposed Experimental Practice after listing the applicable regulation:

R645-302-214 No application for an experimental practice under R645-302-210 will be approved until the Division first finds in writing and the Office then concurs that:

R645-302-214.100 The experimental practice encourages advances in coal mining and reclamation technology or allows a postmining land use for industrial, commercial, residential, or public use (including recreational facilities) on an experimental basis;

Through the Experimental Practice, the applicant intends to demonstrate that in certain situations, topsoil storage in place provides the same degree of protection for the topsoil materials plus provides a soil bed that promotes faster establishment of vegetative cover and greatly enhances the stability of the reclaimed slopes while providing a very natural looking reclaimed surface. The Division finds that the Experimental Practice encourages advances in coal mining and reclamation technology by providing an opportunity for a demonstration that these goals can be achieved.

The second required finding in this regulation does not apply to the West Ridge proposal.

R645-302-214.200 The experimental practice is potentially more, or at least as, environmentally protective, during and after coal mining and reclamation operations, as would otherwise be required by standards promulgated under R645-301 and R645-302;

The environmental protection standards normally required under R645-301 that are applicable to the Experimental Practice are:

R645-301-232.100 All topsoil will be removed as a separate layer from the area to be disturbed, and segregated.

R645-301-234.200 Stockpiled materials will:

R645-301-234.220. Be protected from contaminants and unnecessary compaction that would interfere with revegetation;

R645-301-234.230. Be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the Division; and

R645-301-242 Soil Redistribution

R645-301-243 Soil Nutrients and Amendments. Nutrients and soil amendments will be applied to the initially redistributed material when necessary to establish the vegetative cover.

Under the Experimental Practice, topsoil on a portion of the site will not be salvaged as a separate layer from the area to be disturbed, segregated, and stored for later use. However, it will be protected as required under R645-301-234.200 as follows:

1. **Contamination.** Native soils could be contaminated by imported fill material; however, no imported fill will contact the undisturbed soils. In reclamation, the imported fill will be taken away and the native fill from adjacent slopes will be replaced in the cuts (see Map 5-12). In all cases, there will be a buffer of native fill between the imported fill and the native soils. In order to minimize the impact of any deleterious effects of the imported fill, bright marker flagging will be placed between the native and imported fills to delineate between the two fills during reclamation for the purpose of ensuring complete excavation and removal of the native fills.

   After removing the imported fills, the native fills will be excavated and placed in the cutslopes to achieve approximate original contour. The native fill should not mix with the undisturbed Midfork soils because of the geotextile. There will be some mixing in RO/RL areas, but the native fill is essentially the same material as the RO/RL soil.

   The imported fill may mix with and contaminate some of the native fill; however, this potentially-contaminated material will be the first to be replaced on cutslopes and will be buried the most deeply.

2. **Compaction.** Pad fill material will compact the soil, but in reclamation, the applicant intends to gouge the surface eighteen inches deep and incorporate alfalfa hay. Below eighteen inches, there should be few effects from the fill. This procedure, combined with natural processes (e.g., freeze/thaw), should adequately alleviate compaction and allow vegetation to become established.

3. **Erosion Protection.** Because the soil will be buried under the fill, it will not be vegetated. However, there will obviously be no erosion.

4. **Soil Redistribution.** No topsoil redistribution is necessary since the soils are retained and preserved in-place, thus preserving and re-establishing the original contour surface. In addition to adequately protecting the topsoil for use in reclamation in-place, the Experimental Practice will also preserve the channel geomorphology resulting in decreased erosion and a more stable channel very similar to what currently exists.

5. **Soil Microbial Viability.** The Division considered the question of decreased microbial activity in the soil being stored under the pad. Soil that is buried for several years has been

demonstrated to have few, if any, microorganisms when it is uncovered. Many microorganisms are beneficial in plant establishment and growth.

While soils in the Experimental Practice area may have few live microorganisms when uncovered during reclamation, natural inoculation is likely to occur quickly since the site is surrounded by undisturbed areas. Nearly all of the proposed disturbed area would be less than 200 feet from undisturbed areas with the farthest being about 250 feet away. The Division is aware of a nearby area where cryptobiotic soils have become established naturally on a soil borrow area after only eight years. The applicant will try a soil activation treatment on the test plots, and if the test plots are unsuccessful, a commercial soil inoculant could also be tried.

Soil sterility is also a problem where soil is salvaged, stored for several years, and respread, so there is little difference between the proposed practice and what would normally be required.

In the event the Experimental Practice fails, West Ridge Resources has secured and permitted a topsoil borrow area for supplying substitute soil materials that are equal to, or more suitable for sustaining vegetation on nonprime farmland than the majority of the existing topsoil in the Experimental Practice area. The exception is the Midfork soil, which is identified as a Mollisol. However, the Midfork soil only occupies a small percentage of the geotextile protected surface.

The Division finds that the Experimental Practice adequately protects topsoil with the added benefit that channel geomorphology will be preserved resulting in decreased erosion and sedimentation. Thus, the Experimental Practice is at least as, and potentially more environmentally protective during and after coal mining and reclamation operations as would otherwise be required by standards promulgated under R645-301 and R645-302.

R645-302-214.300 The coal mining and reclamation operations approved for a particular land use or other purpose are not larger or more numerous than necessary to determine the effectiveness and economic feasibility of the experimental practice;

The Experimental Practice is being proposed on approximately 4.75 acres for the geotextile placement and 12 acres for the marker strips. This includes the (1) geotextile area which lies in and adjacent to the drainage channel in the right fork of C Canyon overlying Strych and Midfork soils and which would be filled in during construction and (2) the rubbleland areas where brightly colored marker strips would be placed on the original surface prior to fill placement. The only part of the Experimental Practice area where it would be practical to salvage soil is the geotextiled area. The larger 12 acre area is identified as rock rubbleland where numerous rocks and boulders are intermingled with soil materials or where rocks and boulders are so closely spaced that there is little soil. Topsoil removal, storage and replacement would be impractical in this area. Therefore, protecting the soil resources within the rubbleland will preserve these soils in-place which otherwise would have likely been lost.

The entire surface disturbance area is 29 acres. The Experimental Practice area is about 17 acres. The topsoil in the remainder of the disturbed area (~12 acres) will be handled according to the R645-301-200 regulations for salvaging, stockpiling, and redistribution.

The Division finds that the Experimental Practice is being carried out in an area not larger than necessary to determine its effectiveness and economic feasibility.

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

R645-302-214.400 The experimental practice does not reduce the protection afforded public health and safety below that provided by standards promulgated under R645-301 and R645-302.

The soils regulations to which the Experimental Practice applies do not contain requirements dealing with public health and safety. Therefore this regulation does not apply to the situation.

The proposed Experimental Practice should have essentially no effect on any aspect of the reclamation dealing with public health and safety. If anything, the reclaimed slopes should be more stable after applying the Experimental Practice since they will not have been excavated and replaced.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section. Specifically, in accordance with:

R645-302-214, The Division finds that the Experimental Practice:

1. Promotes advances in coal mining and reclamation technology by providing an opportunity for the applicant to demonstrate that topsoil storage in place provides the same degree of protection for the topsoil materials plus provides a soil bed that promotes faster establishment of vegetative cover and greatly enhances the stability of the reclaimed slopes while providing a very natural looking reclaimed surface.

   The applicant is not proposing a postmining land use for industrial, commercial, residential, or public use (including recreational facilities) on an experimental basis, so the second finding in R645-302-214.400 does not apply.

2. Provides at least the same degree of protection of the topsoil resource as would be given using traditional salvage operations. Other components of reclamation would be enhanced by the proposed practice. Stream channel morphology is preserved which should lead to less erosion and sedimentation. Soil structure and integrity would be easier to reestablish when the site is reclaimed. Rocks, roots, and other materials should still be present at the time of reclamation, and this should lead to greater surface structural diversity and greater plant and animal species diversity.

3. Is being carried out in an area not larger than necessary to determine its effectiveness and economic feasibility. The majority of the area containing topsoil will have the topsoil removed and stockpiled prior to construction of the proposed mine site. The only part of the Experimental Practice area where it would be practical to salvage soil is the geotextiled area. The larger 12 acre area is identified as rock rubbleland where numerous rocks and boulders are intermingled with soil materials or where rocks and boulders are so closely spaced that there is little soil. Topsoil removal, storage and replacement would be impractical in this area. Therefore, protecting the soil resources within the rubbleland will preserve these soils in-place which otherwise would have likely been lost.

4. Because the soil protection regulations from which the applicant is seeking an exemption do not contain provisions for protection of public health and safety, the requirements of R645-302-214.400 do not apply. However, the proposed Experimental Practice will have no

negative effect on public health and safety. It should, if anything, increase the stability of the reclaimed slopes thus assisting in providing safe and stable slopes.

R645-302-210, Issuance of this permit will specifically authorize West Ridge Resources, Inc. to conduct an Experimental Practice in conjunction with their approved Coal Mining and Reclamation Operations which allows for the protection of topsoil "IN-PLACE" rather than salvaging soil and stockpiling it for future reclamation. West Ridge Resources, Inc. will follow the plans as outlined in the approved Mining and Reclamation Plan, Chapter 2 and Appendix 2-6 and will be required to evaluate the effectiveness of the Experimental Practice on an annual basis. The Division will conduct annual reviews of the practice to ensure that it fully protects the environment and the public health and safety. In the event that the Experimental Practice is determined to be not as environmentally protective as would otherwise be required by standards promulgated under R645-301 and R645-302, revised reclamation plans which utilize standard reclamation technology will be required.

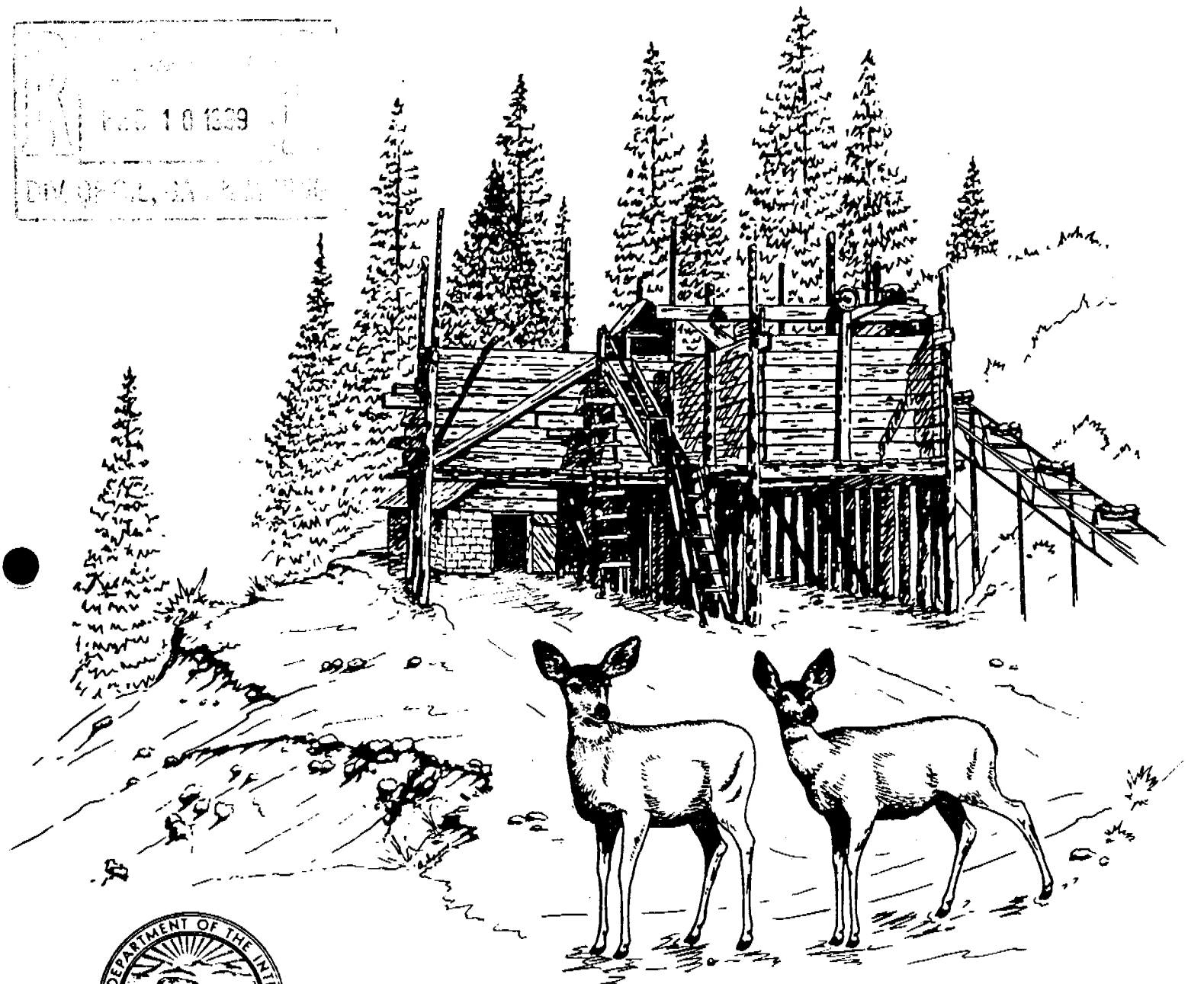
CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

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

Analysis:

The Division will provide an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation and all anticipated mining upon surface- and ground-water systems in the cumulative impact area. The CHIA will be sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The Division intends to use data and analyses submitted in the PAP by the applicant, including the report by Mayo and Associates in Appendix 7-1, and information from federal and state agencies and the Sunnyside Mine MRP.

SITE SPECIFIC ANALYSIS
PART 2



FINAL

ENVIRONMENTAL STATEMENT

Development of Coal Resources in Central Utah

DEPARTMENT OF THE INTERIOR

FINAL

ENVIROMENTAL STATEMENT

SITE SPECIFIC ANALYSIS - PART 2

DEVELOPMENT OF COAL RESOURCES IN CENTRAL UTAH

Prepared by the
DEPARTMENT OF THE INTERIOR

H. William Menard

H. William Menard, Director
U.S. Geological Survey

1979

VOLUME CONTENTS

Part 2

SITE SPECIFIC ANALYSIS

Mine name and proponent

B Canyon mine;
United States Steel Corporation

Belina No. 2 and O'Connor mines;
Valley Camp of Utah, Incorporated

Deadman Canyon mine;
AMCA Coal Leasing, Incorporated

Fish Creek and Dugout Canyon mines;
Pacific Gas & Electric Company

McKinnon Nos. 1 and 2 mines;
Routt County Development, Limited

Mountain States No. 1 mine;
Mountain States Resources Company

Skumpah Canyon mine;
Energy Reserves Group, Incorporated

S I T E S P E C I F I C A N A L Y S I S

B Canyon Mine

On all or parts of lease Nos. U-039706, U-068754, U-01215,

and U-010140

Proponent: United States Steel Corporation

CONTENTS

ILLUSTRATIONS

TABLES

B CANYON MINE

(PROPONENT: UNITED STATES STEEL CORPORATION)

CHAPTER I

DESCRIPTION OF THE PROPOSED ACTION

A. INTRODUCTION

United States Steel Corporation submitted a plan for approval to mine one million tons per year (mty) of high volatile coking coal, mainly from land under Federal lease (all or parts of Federal lease Nos. U-039706, U-068754, U-01215, and U-010140). The complete mining and reclamation plan (MRP) is on file and available for public review at the office of the Area Mining Supervisor, U.S. Geological Survey (USGS), Salt Lake City, Utah. Plans and land-use applications for all of the proposed primary surface facilities to support the underground operation have been submitted for approval in accordance with Title 5 of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776; 43 USC 1761). Applications have not yet been made for a few minor surface facilities. This statement analyzes the anticipated environmental impacts that could result from approval and carrying out the action or alternative action of the mining plan and other filed applications. Proposed rights-of-way not yet submitted for approval may require additional environmental analysis prior to approval and construction.

The proposed B Canyon mine would replace the company's Geneva mine, which is expected to be depleted within 10 years. Coal from the Geneva mine is rail-shipped to a preparation plant near Wellington, washed and mixed there with coal from the company's Somerset mine in Colorado, and shipped to Geneva Steel Works near Provo, Utah, for making coke.

The proposed minesite is in the Book Cliffs coal field in Carbon County, Utah, 12 miles north-northwest of the Geneva mine and about 25 miles east of Price (fig. 1). A highway and rail spur from East Carbon is proposed for access to the mine (fig. 2). The proposed highway route is near an existing unimproved road from East Carbon to the mine area and the rail spur would join an existing Denver and Rio Grande Western Railroad (D&RGW) spur line near East Carbon.

B. PROPOSED MINING AND SURFACE OPERATIONS

The B Canyon mine will extract coal from the Lower Sunnyside seam and where safely and economically possible, from the Upper Sunnyside seam (table 1). These two coal beds are in the Blackhawk Formation of Cretaceous age and have been explored by prospect openings along the outcrop, drilling, and an exploration tunnel driven from the adjacent Sunnyside No. 1 mine of Kaiser Steel Corporation. The coal-bearing rocks in the B Canyon area dip 7° to 10° to the northeast. Access to the Lower Sunnyside seam from the plantsite would be through a rock tunnel starting well below the seam

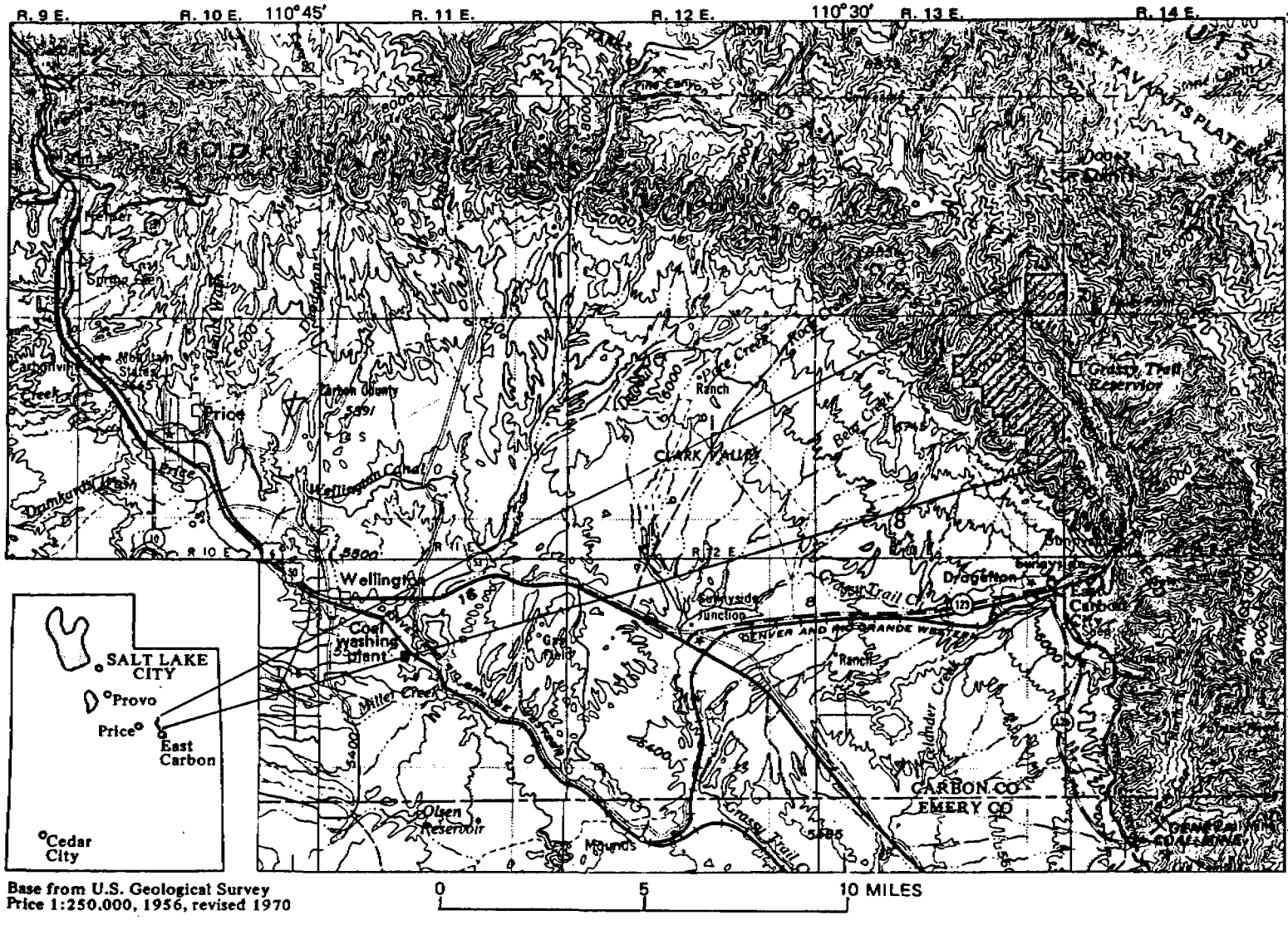


FIGURE 1.--United States Steel Corporation's B Canyon property, Carbon County, Utah.

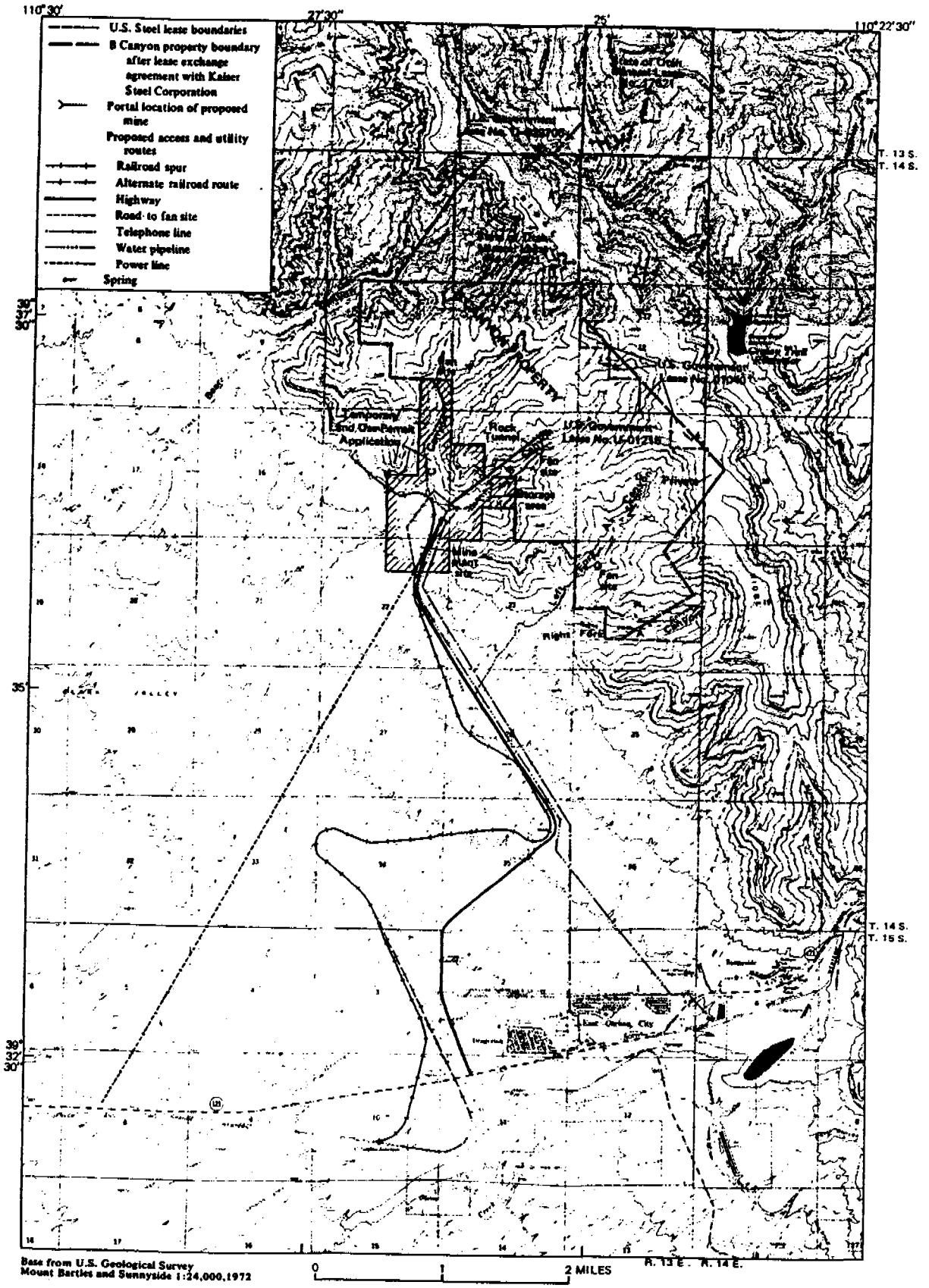


FIGURE 2.--Coal lease and proposed B Canyon mine surface facilities.

TABLE 1.--Summary of mining and reclamation plan and ancillary facilities

Full production	1,000,000 tons per year
Estimated production life	More than 25 years
Mine plan area (acres) (see fig. 3):	
Federal lease	2,629.0
State lease	1,260.8
Private land	31.7
Total	3,921.5
Product	Coal for making coke
Market	U.S. Steel, Geneva Steel Works, Geneva, Utah

Estimated coal reserves and recovery:

Upper Sunnyside seam: no detailed estimates available. Seam is 4-6 feet thick in about 160 acres in secs. 10 and 11 of T. 14 S., R. 13 E., and could be mined without endangering Lower Sunnyside seam mining. The interval between beds elsewhere is less than 28 feet.

	Federal lease (includes private)	State lease
Lower Sunnyside seam:		
Reserves (4 feet or more thick) (tons)	31,000,000	17,000,000
Recoverable (tons)	15,600,000	5,000,000
Unrecoverable (tons)	15,400,000	12,000,000
Recovery rate (percent)	50.3	29.4
Overburden (feet)	50-2,540	1,130-3,800

Gilson seam: not economically mineable.

Surface requirements:

Facility[1]	Federal land applications (acres)	(number)	Surface disturbance (acres)
Mine plantsite and storage area	480	U-35675	79
Coal preparation plant, near Wellington, Utah	(2)		0
Highway, 5.2 miles, right-of-way 100 ft	63	U-35677	63
Railroad spur, 7.5 miles, right-of-way 100 ft	91	U-35678	91
Powerline, 7.5 miles, right-of-way 100 ft	91	U-35680	5
Telephone line, 4.4 miles, right-of-way 30 ft	16	U-35676	4
Water pipeline, 5.2 miles, right-of-way 20 ft	13	U-35679	13
Water pipeline, plantsite to storage, 0.4 miles	(1)		1
Road to A Canyon fansite, 1.8 miles	(1)		2
Road to B Canyon fansite, 0.9 miles	(1)		3
Road to C Canyon fansite, 1.1 miles	(1)		1
Borrow pit, location not specified	(1)		--
Approximate total area	754		262

TABLE 1.--Summary of mining and reclamation plan and ancillary facilities--Continued

Surface requirements--Continued:

Mine plant at mouth of B Canyon includes: 60-75 acres: Office building, 2,100 ft^2; bathhouse and training building complex, 12,000 ft^2; surface shop and warehouse, 14,000 ft^2; mine-car dumping station; transfer and crusher building; bulk oil tank, 20,000 gals; roof-bolt storage shed, 3,000 ft^2; rockdust bin, 100 tons; ambulance and garage building; oil house; portal; belt conveyor from transfer and crushing station to unit-train silo; coal storage silo; sewage system; electrical substation, 5,000 KVA, 60 ft x 80 ft; five fire-hose houses at strategic locations; six-inch water line; parking area, 153 cars; storage yard; topsoil storage area; mine-refuse pile; solid-waste land fill.

Storage-area in B Canyon: 3-4 acres: Powder magazine; cap magazine; cullinary water storage tank, 200,000 gals, 36 ft diameter, 26 ft high.

Other requirements:

Production schedule:

Year	Personnel	Continuous and longwall mining machines	Estimated production (tons)
1	150 construction	--	0
2	150 construction	--	0
3	not given	3	402,000
4	not given	3	600,000
5	not given	4	685,000
6	238 miners	5	980,000
7	238 miners	4	816,000

Major resource:

Industrial water--------- 250,000 gpd from mined area
Potable water---------- 20,000 gpd by pipeline from East Carbon City
Limestone rockdust------- 6,000 tons per year
Mine props (timber)------ 10,000 per year

Waste production and disposal:

Mine plantsite:

Mine waste rock---------- 100 tons per year, to be disposed on mine plantsite
Other solid waste-------- amount unknown, to be disposed in landfill on plantsite
Sanitary waste----------- from 238 people per day, to be disposed in septic system with drain fields

Coal preparation plant near Wellington:

Waste rock--------------- 150,000 tons per year, no new facilities needed

[1] On lease, included in mining and reclamation plan.
[2] On private land, now operating.

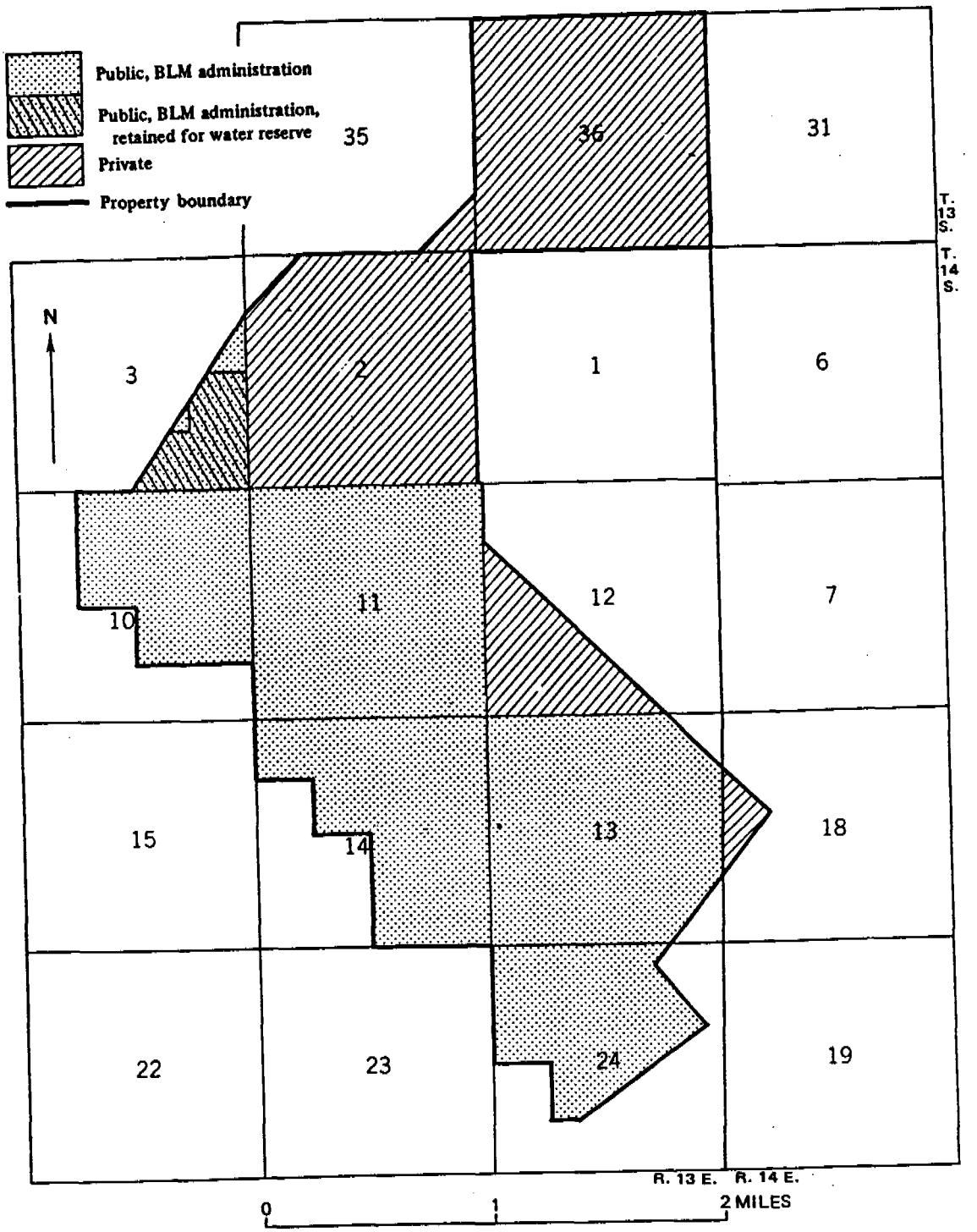


FIGURE 3.--U.S. Steel property surface ownership.

on a bearing parallel to the dip, and on a 2 percent upgrade, to intersect the seam about 5,000 feet from the portal.

A room and pillar system would be used to block out the long panels needed for longwall mining and also to recover coal in more confined areas, particularly in the vicinity of the coal outcrop in the Book Cliffs. Both continuous and longwall mining machines would be used. About 6,000 tons of limestone would be obtained each year to ally mine dust. Transportation of coal within the mine and from mining faces to the portal would be by shuttle car and conveyor belt. Mine cars on tracks would haul men and supplies. From the portal, the coal would continue by conveyor belt to a storage silo, where railroad cars would be loaded and the coal hauled to the existing preparation plant near Wellington (figs. 1, 2).

The proposed plantsite and nearby facilities require about 480 acres of public land on which the company has applied for a temporary land-use permit (figs. 2, 4, table 1). The plantsite at the mouth of B Canyon (figs. 4, 5) would cover an area of 60 to 75 acres. A storage area for explosives and a culinary water tank would cover 3 to 4 acres about 2,000 feet up B Canyon from the plantsite. Ventilation fans would be located in A, B, and C Canyons, accessed by graded dirt roads from the plantsite.

The proposed principal routes of the highway, railroad, water pipeline, and telephone line to the plantsite from present facilities in or near East Carbon City and Dragerton are shown on figure 2. (Alternate routes are discussed in chapter VIII.) The proposed powerline would originate farther west. The lengths of access routes, the areas included in individual rights-of-way of standard width, and estimated areas of surface disturbance from construction are given in table 1. Rights-of-way wider than indicated would be required in some places, where cut and fill is needed for construction of highway, roads, and railroad. Where possible, access and utility routes would occupy a single corridor, which would reduce the total right-of-way area of about 274 acres.

Culinary water would be treated and supplied by the East Carbon City municipal plant from a 0.5 cfs water right held by U.S. Steel on Grassy Trail Creek. About 20,000 gpd would be required, including water for sanitary facilities and a sewage-disposal plant. During the early stages of mining, water for underground dust abatement and fire control would be taken from the culinary water supply. Mining experience in the area indicates that water would become available within the mine as mining progresses; mine water then would be used for industrial needs, 250,000 gpd, and would be stored in a tank on the plantsite.

Coal mined during mine development would be transported by truck using the existing access road. The road would have to be improved and temporary loading and dumping facilities would have to be installed. The mining plan does not include details or specifications for these facilities.

For purposes of analysis in this report, the task force has assumed that 290 employees including support personnel would be required to mine

FIGURE 5.--View to the northeast into B Canyon. The rock tunnel would be about center of the photo. The railroad would enter near the lower right photo corner, curve upward to near the junction of the road and cleared survey line, and then curve down to the lower left corner of the photo. The clear area at the bottom of the photo is the result of juniper tree eradication.

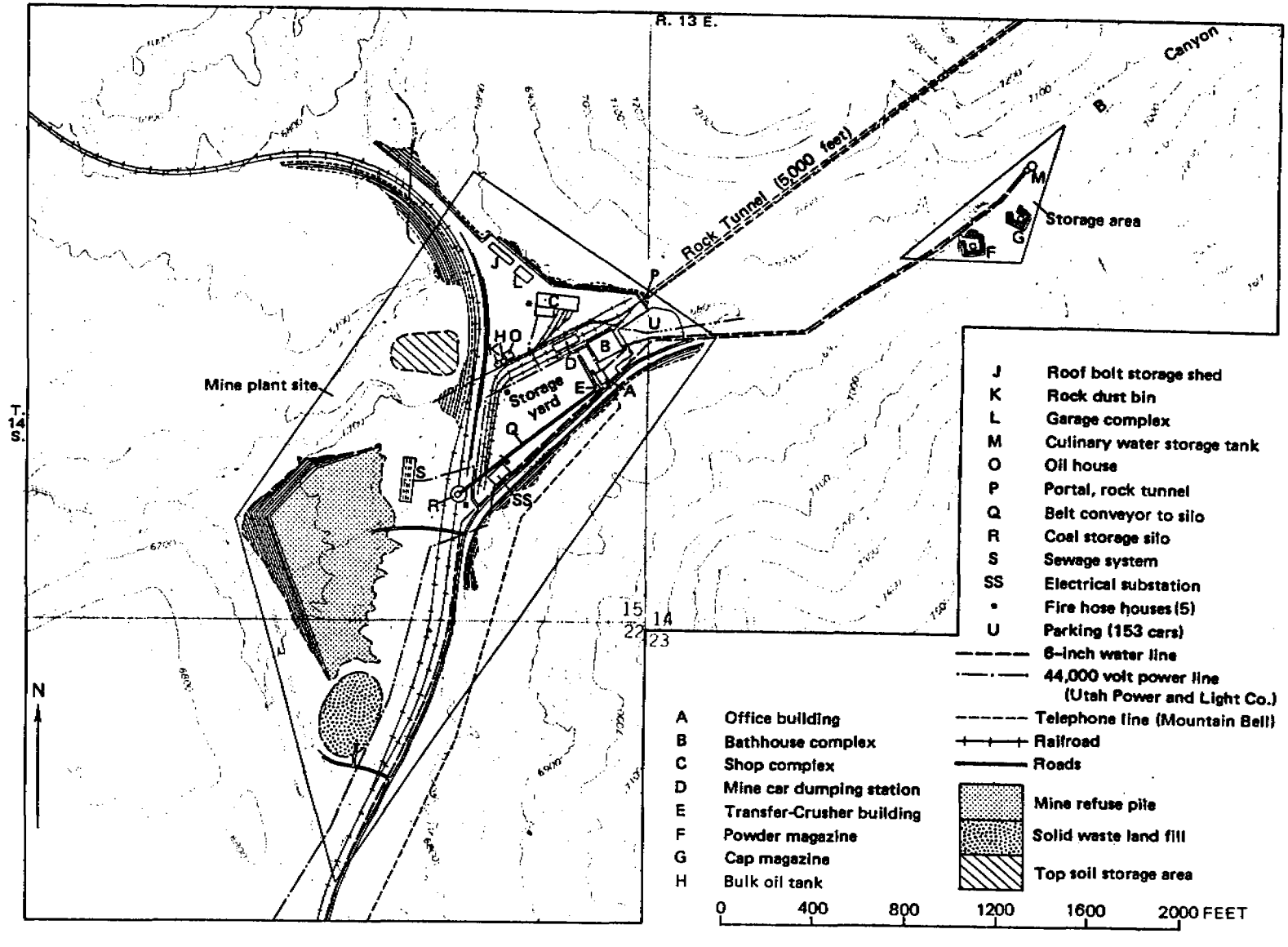


FIGURE 4.--Proposed surface facilities at mine plant and storage area.

one million tons of coal per year. This estimate is based on current and projected Utah production rates of 15 tons per manshift. An average work force of 235 is estimated in the mine plan proposal.

C. ENVIRONMENTAL PROTECTION AND RECLAMATION

The mine plans contain the following statements, with regard to protecting the environment during construction and mining:

"Disturbances to the surface lands will be limited to those areas required for construction of buildings and structures, mine portal openings, and solid rock and waste disposal."

"Mining and reclamation operation shall be controlled by formally engineered plans approved by the Mine Enforcement and Safety Administration and the U.S. Geological Survey. It is anticipated that the only roads on the coal mining lease will be graded dirt roads leading from the mine yard to the mine fans located at the outcrops in A, B and C Canyons. The only purpose and use of the roads will be to provide access for fan construction, inspection and maintenance. Natural drainage will not be impaired. Fan sites will be graded to permit proper drainage. Dams, settling ponds or other earthwork water retention facilities will not be required on the mining lease."

"The operator will take the necessary action to reduce or prevent soil erosion through limiting surface disturbance within the surface plant area and along rights-of-way to that necessary for the installation of these facilities. Areas disturbed during construction will be re-seeded in accord with recommendations of the Bureau of Land Management."

"During the construction period airborne dust will be reduced through sprinkling construction areas with water."

". . .operation of surface equipment will be limited to that required for support of the underground mining operation."

"In the event it is necessary to discharge mine water, the operator will obtain necessary EPA discharge permits and be governed by these permits. . . .disposal of waste material will be in accord with State and Federal regulations in effect at that time."

"Culverts and pipe will be placed when necessary so as not to impede runoff of such (melting snow or runoff) water."

"Permanent damage to vegetative growth will be reduced by disturbing only the surface required for the operation by engineering control during construction."

"The applicant will comply with all Federal, State, and local regulations pertaining to air and water quality control. . .As mining progresses below the water table, it is anticipated that it will be necessary to pump ground water out of the mine and discharge it to the surface. Should it be necessary to discharge water from the mine, the operator will apply for the necessary permits to discharge and shall monitor the discharge as required by the permit. Sanitary water disposal will be conducted through a septic system with drainfields conforming to state codes."

The mine plan contains the following statements, with regard to reclamation after mining has ceased:

"It will be the objective of the operator, upon completion of mining operations, to restore disturbed surface lands to a condition compatible with its original use. The area will be regraded to conform to original landscaping as near as possible. Top soil will be distributed over the graded areas and the area reseeded, to the specification of the BLM to establish new vegetation."

"When mining activities are completed, the mining machinery will be removed and the portals sealed according to state and Federal regulations. The building not utilized will be removed."

"Reclamation of the surface lands would commence following the removal of, or in-place disposition of the surface facilities."

"Building and structure sites will be graded to original contours or as near as possible. Surfaces will be prepared and seeded in accordance with practices in effect at the time. Reclamation of the land surface should be accomplished within one to two years after underground work is complete."

"Roads, if no longer required, will be plowed and seeded."

"Restoration work on the mining lease will include sealing of the mine openings with permanent, non-combustible seals approved by the MESA and USGS. Mine openings will be sealed and covered with earth and rock to the original contours or as near to that as practical. Excavations at the mine openings will be covered with earth and rock to the natural angle of repose. The fills will be re-seeded as recommended by the BLM."

The mine plans refer to monitoring in the following statements:

"Roads required for access to drill site or subsidence monitoring sites will be narrow, graded dirt roads which can be easily restored to original contours and surface conditions."

"The possibility exists that in the future it may be necessary to construct graded dirt roads over the surface of the lease property for the purpose of drilling and (or) subsidence investigations."

"The operator will monitor water quality as required by the State and Federal agencies exercising control over water quality."

"Should it be necessary to discharge water from the mine, the operator will apply for the necessary permits to discharge and shall monitor the discharge as required by the permit."

D. LEGALLY ENFORCEABLE MITIGATING MEASURES

Planning and environmental controls that govern and importantly relate to the proposed action are in chapter III, part 1. Total mining operations will be conducted in accordance with Federal and State laws and regulations, and State approval of the proposed actions with regard to State environmental laws will be required before approval of the mining plan.

The mining and reclamation plans included in this statement were submitted for review prior to the promulgation of initial regulations (30 CFR 700) required under Section 502 and 523 of the Surface Mining Control and Reclamation Act (SMCRA) of 1977 (P.L. 95-87) and have not been officially reviewed for compliance therewith. Therefore, the mining and reclamation plans may not reflect the requirements of the initial regulations. However, this analysis is based on the applicant adhering to applicable regulations. The operator has been requested to revise the mining and reclamation plans in accordance with the applicable initial regulations. As soon as the mining and reclamation plans are revised they are to be submitted to the Office of Surface Mining Reclamation and Enforcement (OSM) and the State regulatory authority to determine compliance with the requirements State laws and of Federal regulations 30 CFR 211 and 30 CFR 700. The mining and reclamation plans cannot be approved until they conform to all applicable requirements.

Mining practices and procedures will be designed to minimize subsidence and to make it as uniform as possible, consistent with maximum coal recovery and mine safety. The mining company will monitor subsidence and where required will fence and post areas potentially dangerous to humans and livestock. Fences will be constructed in accordance with surface regulatory authority requirements to allow proper wildlife movement. Sufficient coal will be left in place near coal outcrops in the Book Cliffs to avoid excessive rock slides and rock falls. All suitable topsoil will be stockpiled as required by the appropriate regulatory authority. Soil will be kept out of drainage ways during construction to avoid loss or impacts on water quality.

The revised Utah State Antiquities Act (1977) provides for the preservation and (or) protection of paleontological values on State land. Discovery of such values on Federal land will be brought to the attention of the appropriate regulatory authority.

If any springs, streams, or wells from which water has been appropriated or which are deemed significant to the human environment, are affected by mining, the company shall replace the water in kind or make restitution, as required by the State of Utah (Title 73-3-23) or the Office of Surface Mining Reclamation and Enforcement, whichever is applicable.

To determine the effect of mining on water, the company shall inventory water resources before mining and monitor the flow of springs and streams, the water level in wells, and the chemical quality of these waters during mining. With respect to the water reserve in sec. 3, T. 14 S., R. 13 E. (fig. 3), the applicant will be required to execute such stipulations and agreements as may be deemed proper and necessary by the appropriate regulatory authority to safeguard the public interests, after investigation of the facts, circumstances, and conditions in connection with each individual case. Mine water shall be contained and treated as necessary to meet the quality standards required by the State (title 73-14-1, et al.), EPA, or OSM, whichever is applicable, before being discharged or allowed to enter any waters of the State.

An EPA review is required to determine the Best Available Control Technology (BACT) where potential fugitive dust emissions are equal to or greater than 250 tons per year. Each mine operator will have to employ the Best Management Practices for fugitive dust regardless of predicted concentrations during operation. Thus, each mining plan and the Department's approval thereof shall use an appropriate combination of dust controls, see EPA, 1978, and at a minimum the following:

- Pavement or equivalent stabilization of all haul roads used or in place for more than one year. Major access routes and coal haulage routes are considered haul roads.

- Treatment with semi-permanent dust suppressant of all haul roads used or in place for less than one year or for more than two months.

- Watering of all other roads in advance of and during use whenever sufficient unstabilized material is present to cause excessive fugitive dust.

- Reduction of fugitive dust at all coal dumps, truck to crusher locations through use of negative pressure bag house or equivalent methods. Inclusion of conveyor and transfer point covering and spraying, and the use of coal loadout silos.

State law 27-12-146 requiring trucks to be constructed, loaded, or their loads so protected that materials will not sift, fall, or otherwise leave the vehicle on or near public highways will be followed.

The access road right-of-way will be fenced. The fence design will permit appropriate wildlife movement. The road will also provide large animal crossings (i.e., large culverts) at major draws. Gates will be provided on side roads to aid in stock-water hauling. Prior to any land disturbing activities a survey will be taken for threatened or endangered plant and animal species, especially the black-footed ferret. Any listed species found will be protected. (See part 1, chapter III, Endangered Species.) Consultation with the U.S. Fish and Wildlife Service may be required if a black-footed ferret is located. Reclamation to restore vegetation to 90 percent of original productivity will be required.

The B Canyon mine proponents and the appropriate regulatory authority will comply with the basic 1906 Federal Antiquities Act (P.L. 59-209; 34 Stat. 225), Sec. 106 the National Historic Preservation Act of 1966 (P.L. 89-665, 80 Stat. 915, 16 USC, Sec. 470f, as amended, Stat. 1320), the Historical and Archeological Data Preservation Act of 1974 (P.L. 93-291), and the Advisory Counsel's "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800), prior to approval of any undertaking which will affect cultural properties included in or eligible for inclusion in the National Register of Historic Places.

The BLM, Utah State Director, and the Utah State Historic Preservation Officer have entered into a memorandum of understanding which sets forth measures the Bureau would undertake in regard to the protection of cultural resources on public lands. The principal point in the agreement is that the project proponents will be required to have an intensive survey made for all areas that will be disturbed. If any sites are found to be of National Register significance, the project would either have to be altered so as to avoid the site(s) or provide for the preservation of data from the site(s). A cooperative agreement having the same effect exists between the USGS and BLM for "Protection of Cultural Resources related to Onshore Mineral Lease Operations exclusive of Oil, Gas, Geothermal, and Oil Shale" leases.

CHAPTER II

DESCRIPTION OF THE EXISTING ENVIRONMENT

A. NATURAL ENVIRONMENT

1. Climate

The general climate is described in part 1, chapter II. Average monthly temperature at the minesite ranges from 25°F in January to 70°F in July. Temperature extremes range from about 0°F to 90°F. Precipitation averages 10 inches per year, and potential evaporation averages 36-40 inches per year. Maximum snow accumulation averages less than a foot.

2. Land

a. Land surface

The southwest-facing Book Cliffs are rugged and deeply dissected by box canyons of intermittent streams, which also cut the pediments that slope gently away from the foot of the cliffs toward the Price River (figs. 1, 2). Altitudes range from 6,800 feet at the mine plantsite near the base of the cliffs to more than 8,800 feet at the top of the ridge 2 miles northeast. Large boulders and smaller debris of sandstone from rock slides and rock falls are strewn along the sides of the cliff-rimmed canyons and the pediments beyond the canyon mouths. All proposed access and utility routes cross the pediment and the intermittent streams that drain southwestward (figs. 1, 2). The highway and railroad routes climb from 6,100 feet near East Carbon to 6,800 feet at the plantsite.

b. Geology

The Castlegate Sandstone and other thick sandstone beds of the Upper Cretaceous Mesaverde Group (fig. 6) form cliffs and account for the rugged topography. Above this section in the lease area, the Price River, North Horn, Colton, and Green River Formations are also exposed. The Mancos Shale underlies the Mesaverde Group at the base of the cliffs. The regional strike is parallel to the face of the Book Cliffs (fig. 1), and dips are 7° to 10° to the northeast, away from the cliff face. The project area has not been surveyed for paleontological resources. Vertebrate and plant fossil-bearing areas are shown on figure II-7. The mining plan states that no faults are known on the B Canyon property, but Doelling (1972, p. 383, and figure 36, p. 384, 385) indicates a northwest-trending fault in the southern part of secs. 10 and 11, T. 14 S., R. 13 E. A parallel fault 0.8 miles southwest is outside the southwest boundary of the property. Displacement on the faults exceeds 100 feet in some places.

c. Energy and minerals

Asphaltic sandstone in the upper part of the Colton Formation and lower part of the Green River Formation occurs in the northern part of the property, at the southwest edge of a large area of asphaltic sandstone that extends northeastward toward the Uinta basin. No use is being made

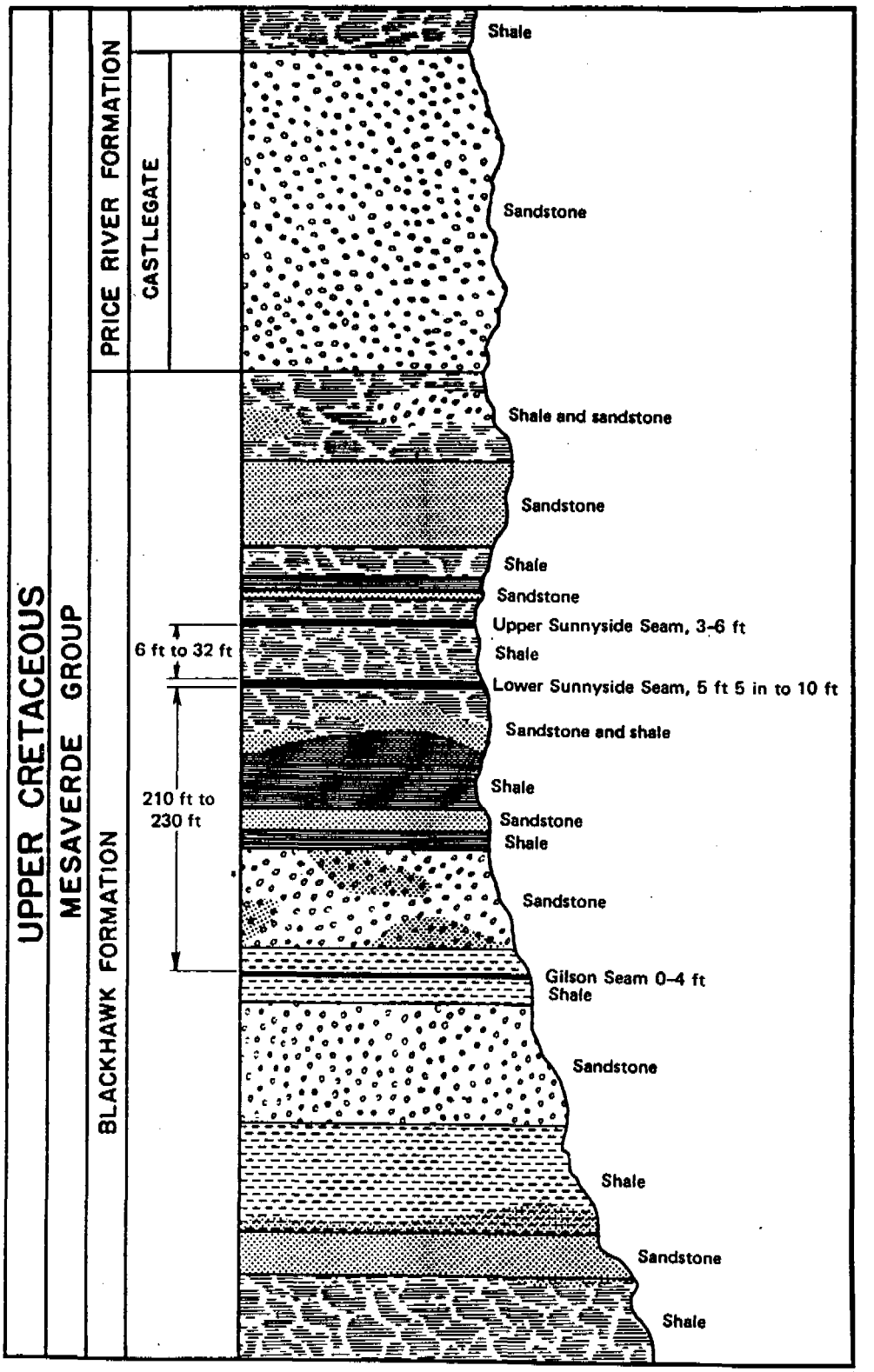


FIGURE 6.--Sketch showing age and sequence of rock units in the B Canyon property area.

of the sandstone at present, but some has been crushed and used for road paving. No oil or gas test holes have been drilled on B Canyon property, but oil and gas have been found in the rocks above the coal-bearing section northeastward on the flank of the Uinta basin and in older Cretaceous and pre-Cretaceous rocks to the west.

d. Soils

Two general soil areas prevail: 1) soils on clifflands and canyons, and 2) soils on pediments. Also associated with these areas are soils derived from stony colluvium at toeslopes and gravelly alluvium along drainageways.

Soils on clifflands and canyons occur on the steep terrain of the Book Cliffs and have formed primarily from parent materials of sandstone and minor amounts of shale. They are typically medium textured, shallow to moderately deep, and cobbly to stony. They are well drained to excessively drained. On southerly aspects, soils tend to be shallow and rocky with a low revegetation potential. On northerly aspects, soils are cooler, moister, better developed, and more productive. Soils on pediments are derived from alluvial materials on an erosional plain below the Book Cliffs. The area is moderately dissected by intermittent streams. The soils are generally deep, medium textured, relatively light colored, and cobbly to very cobbly. Carbonate accumulates in the subsoil because of low precipitation. Aridity limits soil development and productive potential. Topsoil is generally thin. The soils are well drained, and permeability is moderate. Slopes are commonly 5 to 10 percent, but steeper locally along drainage dissections and small ridges, particularly near the mouth of B Canyon. On the steeper slopes, soils are more cobbly and stony. Erosion hazard by water action, should vegetation be removed, is low to moderate. Wind-erosion potential is moderate. Because of climatic and soil conditions, 30 to 50 percent of annual revegetation attempts are expected to be successful (Hagihara and others, 1972).

3. Water

a. Water supply

Water on or near the B Canyon property is obtained mainly from springflow and runoff. Runoff stored in Grassy Trail Reservoir (fig. 1), capacity 1,000 acre-feet, is the principal source of water for the East Carbon city area; annual domestic usage is about 500 acre-feet. U.S. Steel Corp. has water rights on Grassy Trail Creek for 0.5 cfs (362 acre-feet per year) for use in mining. The mean annual flow of Grassy Trail Creek downstream of Grassy Trail Reservoir at the mouth of Whitmore Canyon near Sunnyside (drainage area 40 square miles) is estimated at 3.5 cfs or 2,500 acre-feet per year (written communication, K. M. Waddell, Hydrologist, USGS, 1977). Water from springs and streams is used by wildlife and livestock.

1) Surface water

The area proposed for mining underlies A, B, and C canyons and parts of Bear Canyon and Left Fork Whitmore Canyon, all tributary to Grassy Trail Creek (figs. 1, 2), which flows through Sunnyside and East Carbon City and generally southeastward to the Price River. All canyons except Left Fork Whitmore drain southerly from the Book Cliffs and join Grassy Trail Creek downstream from Sunnyside; they are dry most of the time and flow mainly in response to rainfall or snowmelt. Left Fork Whitmore Canyon drains 8 square miles northeast of the Book Cliffs; springs contribute to perennial flow, and annual runoff to Grassy Trail Reservoir averages 700 acre-feet. Grassy Trail Reservoir is slightly more than half a mile east of the proponent's lease area; the total drainage area upstream from the reservoir is about 20 square miles, and annual runoff averages 1,750 acre-feet. About 1.3 square miles of the B Canyon property is in the Left Fork Whitmore Canyon watershed and transects the drainage 1 1/2 miles upstream from Grassy Trail Reservoir. The part of the watershed overlying and upstream from the property contributes about 600 acre-feet of water per year to Grassy Trail Reservoir.

2) Ground water

The deeply incised drainage system in the area drains exposed bedrock, and the upper water-yielding sandstones are discontinuous and partly void of water near cliff faces. Ground water may be perched, or impeded from deeper infiltration by one or more layers of rock having relatively low permeability. Permeable strata in most of the formations above the Mancos Shale, including the coal-bearing Blackhawk Formation, probably contain water. Several deeper formations, including the Emery and Ferron Sandstone Members of the Mancos Shale may also be expected to yield water. Little or no water is present near the outcrops of these formations along the Book Cliffs, however, because of drainage or movement downdip, generally northeastward. Springs fed by ground water are found along northward-facing outcrops above less permeable strata and along fracture zones. Nine springs are on or near the property and plantsite (fig. 2); two of these are one-quarter mile north of the property and the map area on sec. 25, T. 13 S., R. 13 E.

Ground-water bodies are recharged by precipitation, which infiltrates even through less permeable strata. Although the amount of water infiltrating through a unit area of less permeable strata is small (probably less than 5 percent of annual precipitation), the total infiltration area is large, and the amount of infiltration is as much as 30 acre-feet per year per square mile. Ground-water bodies are recharged to a small extent by precipitation on outcrops of some of the more permeable sandstone aquifers along the cliffs and slope faces of the Book Cliffs.

4. Air

Air quality has not been monitored near the site. An annual average background level of total suspended particulates (TSP) for rural locations

in central and southern Utah of 20 micrograms per cubic meter ($\mu g/m^3$) has been estimated by AeroVironment (1977). During periods of high wind, short-term TSP standards can be exceeded in rural Utah areas as a result of wind-blown dust. The background visual range was estimated to be 37 miles (60 km) and was based on the background TSP estimate (AeroVironment, 1977). Measurements of atmospheric visibility (visual range or discoloration) are extremely limited in the study area. Values of visual distance derived from light-scattering measurements from an integrating nephelometer averaged 67 miles for the period September 1970 to March 1971. Average visual range calculated from particle size distribution at Bear Creek and Huntington Canyon (fig. II-11) in 1974, was approximately 45 miles. Analysis of photographs taken at Clawson, Utah (fig. II-11), from January to June 1974, indicated 50 mile visibility 49 percent of the time. Visibility was reduced below 5 miles only 12 percent of the time. Visibility measurements at Cedar Mountain, east of Castle Dale (fig. II-11), averaged 94 miles in November-December 1976, and 54 miles in April 1977 (Pueschel and others, 1978).

5. Vegetation

Pinyon-Juniper and lesser amounts of Grassland Mountain Brush and Conifer-Aspen at the highest altitudes are the vegetative types (part 1, chapter II) in the property area. Vegetative cover transitional between the major types is common. Most of the access route and surface facility areas were once covered by the Pinyon-Juniper type. Example species are Utah juniper, pinyon pine, big sagebrush, Indian ricegrass, and Mormon tea. However, much of the Pinyon-Juniper type was removed in 1966, and the area was changed to Grassland type through planting of crested wheatgrass and alderleaf mountain mahogany. Some native plants remaining are Indian ricegrass, fourwing saltbush, and galleta grass. In addition, the pinyon and juniper have reinvaded the area extensively. No threatened or endangered plant species have been identified on the lease area (Welsh, 1977).

6. Wildlife and Fisheries

The variety of wildlife species in and near the proposed mine development is large. Vertebrates number nearly 360 varieties, (Dalton and others, 1977) of which the better known species are mule deer, mountain lion (cougar), black bear, coyote, red fox, gray fox, kit fox, bobcat, raptors, chukar partridge, blue and ruffed grouse, mourning doves, and rabbits. Several squirrel, chipmunk, and mice species inhabit the area and white-tailed prairie dogs are near the proposed access routes and mine plantsite. These species are prey to badgers, skunks, bobcats, coyotes, foxes and raptors. Several species of lizards, snakes, and other reptiles are throughout the area, but no gamefish are in the vicinity.

The proposed mine would be in Utah's 1,169,000-acre deer herd unit 27B winter range (fig. II-15). Winter range is the limiting factor on deer population (fig. 7). The optimum winter range population for deer herd unit 27B (Utah Department of Fish and Game, 1967; written communication, L. J. Wilson, 1977) is:

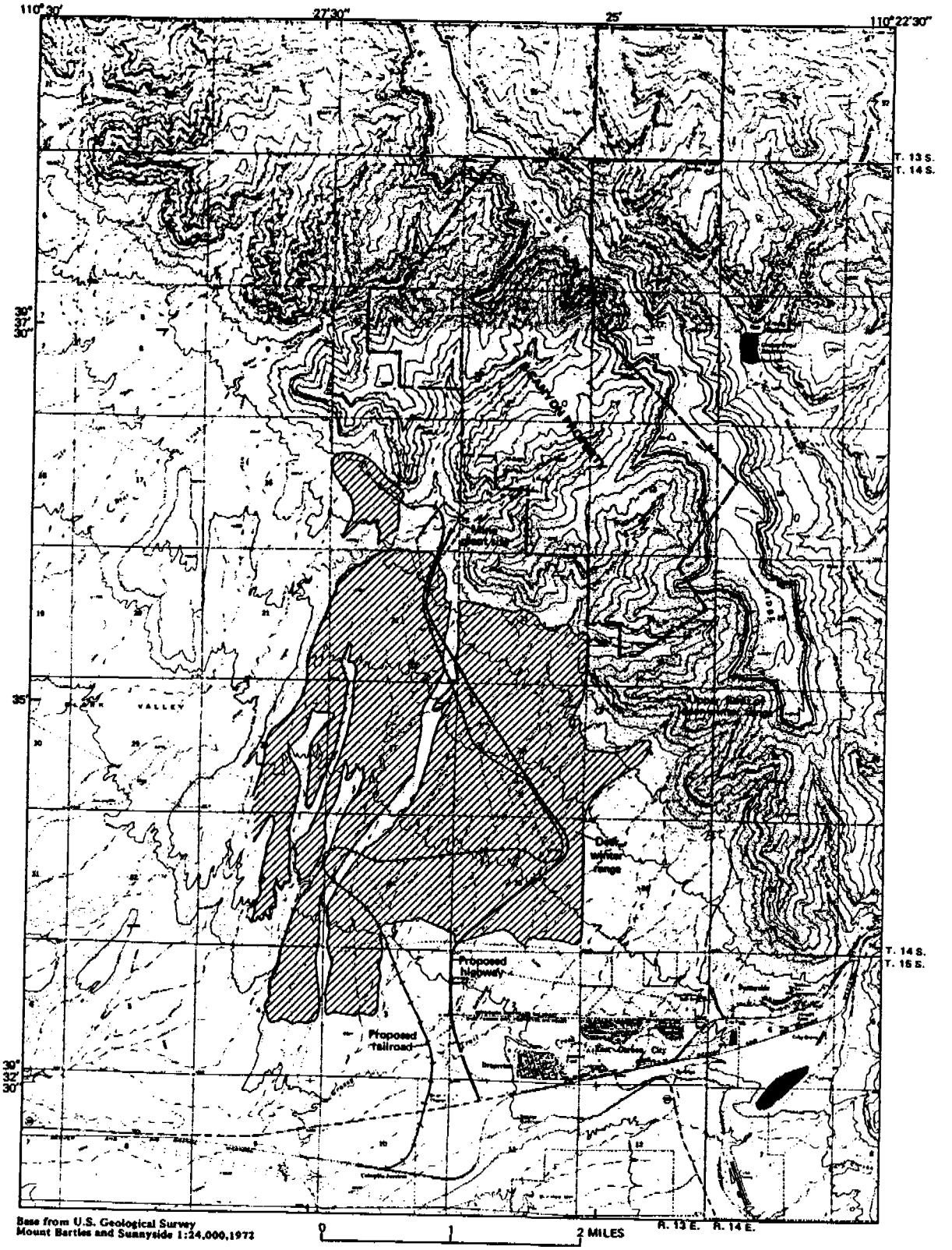


FIGURE 7.--Map of B Canyon property showing winter range of deer.

Vegetative type	Acres available: Normal winter	Acres available: Severe winter	Optimum deer population
Total winter range------	573,824	364,864	29,885
Pinyon-juniper-mountain brush-grass----------	195,584	157,760	10,893
Grassland----------	14,208	14,208	1,133

Mountain lions (part 1, chapter II) range in the vicinity of the proposed mine. These usually solitary and sensitive animals (Seidensticker and others, 1973) establish home areas closely associated with the seasonal distribution of deer, which serve as their primary food source.

Black bears are in the area. Based on Utah harvest figures, unit 27B ranked second highest in the State, with 31 taken during 1967-76. Black bears maintain well-defined home areas that are mostly linear, oriented upslope and downslope (Jonkel and Cowan, 1971) and that are stable from year to year, and the availability and distribution of food influences movements (Amstrup and Beecham, 1976).

The black-footed ferret is an endangered species and much of the pediment slope southwest of the B Canyon property is listed as potential black-footed ferret range (Hinckley, 1970, Scott and others, 1977). However, as of 1978, no black-footed ferrets have been identified in or near the B Canyon property.

A wide variety of perching birds inhabit the area year-round. Raptors use the entire area year-round. They nest on cliffs and ledges or in trees, depending on the species preference. The pediment slope southwest of the Book Cliffs provides hunting fields. Small animals, birds, and reptiles are the food source.

Chukar partridge were introduced in 1951 and live along the base of the Book Cliffs around the mouth of B Canyon. Blue and ruffed grouse may be in the vicinity of the proposed mine, and mourning doves are common spring-summer nesting residents. Probably the most important habitat component for nesting doves is available water and second in importance is nest trees (Caldwell, 1964).

B. CULTURAL ENVIRONMENT AND LAND USE

1. Lands

The proposed mine development, including Federal and State lands, lies within a mining and grazing zone. The zoning ordinance was first

adopted May 19, 1959, and subsequently amended by the Board of County Commissioners of Carbon County. The current ordinance is dated February 15, 1977, with a revised zone map dated 1974. The mining and grazing zone is "characterized by large tracts of desert and open-range land with an occasional mine cabin dwelling, and (or) corral incidental to livestock operations. . .and has been established. . .as a district in which the primary use of the land is for mining and for livestock grazing purposes." Use requirements provide for "open-pit mines, mine-waste dumps, underground mines, buildings, and structures associated with mines and mine dumps . . .mineral reduction and processing plants. . .reservoirs, dams, pumping plants, and water facilities. . .and caretaker dwellings, when incidental to and located on the same lot or parcel of land as a principle use permitted in the zone."

Secs. 1, 3, and 9 of T. 14 S., R. 13 E. contain public water-reserve lands (43 CFR 2311.0-.8) under BLM administration. Water reserve lands were withdrawn under Executive Order 107 of April 17, 1926, which ". . .was designed to preserve for general public use and benefit all unreserved public lands containing water holes or other bodies of water needed or used by the public for watering purposes" (U.S. Department of Interior, 1977, p. 390).

2. Range and Timber

Cattle from the Mud Springs Allotment graze on the gentler southwest slopes of the Book Cliffs and on the pediment slopes beyond. The browse is native Pinyon-Juniper type on the Cliff slopes and Grassland on the pediment. About 340 cattle use the allotment from October 20-December 20 and April 10-June 10, for a total of 2,320 AUM's. However, water for the cattle must be hauled to the northeast portions of the allotment. A large part of the carrying capacity of the allotment comes from several square miles surrounding the various access routes to the proposed mine plantsite. This surrounding area provides 1,385 AUM's and is considered good grazing country. A few junipers are harvested for posts, pinyon nuts are picked when the crop is good, pinyon Christmas trees are cut, and dead trees are used for firewood.

3. Energy and Minerals

No energy or mineral resources have been or are being produced at present on the B Canyon property or any area proposed for associated surface facilities.

4. Socioeconomics

Most of the work force and their families reside in the Sunnyside--East Carbon City vicinity where the current population is about 6,000. The current work force employed to produce 600,000 tons per year at the Geneva mine is about 238. Small communities near Geneva and other nearby mines are economically related to coal mining, and their population is directly proportional to local mine employment (part 1, chapter II).

Price, about 25 miles to the west (fig. 1), is the nearest major shopping center to the communities. The regional socioeconomic environment and expected impacts are discussed in part 1.

5. Transportation and Utilities

A narrow dirt road now connects East Carbon City and the proposed mine plantsite. A spur of Denver and Rio Grande Western Railroad passes through East Carbon City and connects with the main line about 10 miles southeast of Wellington (fig. 1). Power is available from a Utah Power & Light Company line west of East Carbon (fig. 2). Telephone service is available from East Carbon City.

6. Archeologic and Historic Values

Little archeological information is available for the B Canyon property area and close vicinity. A reconnaissance survey by K. K. Pelli in September 1977 (Pierson, 1977), did not locate any archeological sites. One small historic building, much in ruin, is located near the mouth of B Canyon. Wire nails indicate that the cabin is of recent origin. The National Register of Historic Places lists no cultural values for the area. Some work has been done in neighboring areas (Nine Mile Canyon, Castle Valley, San Rafael Swell, etc., 10 to 100 miles from the proposed mine). These investigations have resulted in the recording of many archeological sites.

7. Recreation

Recreation use is low (less than 500 visitor days annually) and potential is limited. Users are primarily from Carbon and Emery Counties and activities are oriented toward daytime use and travel. No services or facilities have been developed for recreation, and none are planned. The proposed mine area lacks perennial potable water, significant user attractions, or outstanding and unique qualities.

8. Esthetics

Visual amenities are extensive, but not outstanding or unique (fig. 5). The toeslopes of the Book Cliffs, including the proposed plantsite, and the straight cliffs above the plantsite have a common (class B) scenic quality. Line form, color, and texture have some variety, but tend to be common throughout the Book Cliffs. The southwest toeslopes of the Book Cliffs where the ancillary facilities would be located have minimal (Class C) scenery quality. Landforms, line, color, and texture have little variation and the area demands little notice. The visual resource management classification (Roy Mann Assoc. Inc., 1977) of the area allows for changes or modifications which may subordinate the existing character (classes IVb and IVc) during the life of the project. Reclamation should restore a natural landscape character to the area.

C. FUTURE ENVIRONMENT

The B Canyon mine is located near operating mines and would replace an existing mine that is exhausting its available reserves. The future environment would change only if this mine were not put into production. If the mine were not approved, presumably other nearby mines might replace the production that would otherwise come from the proposed B Canyon mine.

CHAPTER III

ENVIRONMENTAL IMPACTS

This section describes the anticipated impact of development of the B Canyon property as proposed in the mining plan and as mitigated through methods described in chapter I, "Environmental protection and reclamation," and "Legally enforceable mitigating measures."

A. NATURAL ENVIRONMENT

1. Land

a. Land surface

Construction of the proposed surface facilities, not including a borrow pit, will disturb as much as 262 acres of land (table 1). The surface above the mined area of 3,922 acres would be subject to subsidence (part 1, chapter IV). A maximum potential subsidence of 70 percent of the mined height may be expected or as much as 7 feet where mined panels are 10 feet high. In places where pillars of coal are left for roof support, differential subsidence could result in ridges, depressions, and open fractures, some of which possibly could reach a hazardous size. However, no recorded subsidence related hazardous conditions have resulted from 75 years of mining in areas adjacent to the leasehold. Construction above mined areas would need to allow for subsidence because neither the time nor amount of subsidence can be predicted in advance of mining. Construction and mining along or near the steep cliff fronts could accelerate naturally occuring landslides and rock falls.

b. Geology

Impacts to paleontological resources would consist of losses of plant, invertebrate, and vertebrate fossil materials for scientific research, public eduction (interpretative programs), and to other values. Losses would result from destruction, disturbance or removal of fossil materials as a result of coal mining activities, unauthorized collection, and vandalism. A beneficial impact of development would be the exposure of fossil materials for scientific examination and collection which otherwise may never occur except as a result of overburden clearance, exposure of rock strata, and mineral excavation. All exposed fossilferous formations within the region could also be affected by increased unauthorized fossil collecting and vandalism as a result of increased regional population. The extent of this impact cannot be assessed because of a general lack of specific data on such activities. Because of the lack of data and accepted evaluatory criteria for determination of significance, no meaningful assessment can be made as to the extent and nature of the loss of these paleontological values to science or education, or hence to the significance of potential impacts on the fossil record.

c. Energy and minerals

Lower Sunnyside unrecoverable coal is 27 million of the 48 million tons of total estimated reserves. An unknown amount of coal in the Upper

Sunnyside and Gilson seams is also unrecoverable (table 1). During the life of the mine, improved mining methods, unforseeable economic conditions and (or) changes in Federal government regulations may reduce the amount now considered unrecoverable in the Upper and Lower Sunnyside and the deeper Gilson seams.

d. Soils

As many as 262 acres of soil would be disturbed by proposed construction at the plantsite and along road, railroad, and utility line routes (table 1). On about 13 acres, only part of the vegetation would be removed and soil impacts may be minor. Increased erosion at construction sites would be inevitable during the period of soil exposure, particularly during an intense rainstorm. About 1.5 to 4.0 cubic yards of soil per acre per year would be eroded during the period of soil exposure, 1.0 to 3.0 cubic yards per acre per year above the natural rate (Pacific Southwest Inter-Agency Committee System, 1968). Sediment would be collected on the site in sediment control ponds. The increased erosion applies only to disturbed soils and is a short-term impact. After construction is completed, erosion rates probably would be about the same as now. Productivity of occupied soils would be lost only for the life of the mine and transportation systems. Rehabilitation after mining would restore productivity (chapter VI).

2. Water

a. Water supply

1) Surface water

The impact of subsidence and subsequent fracturing on streamflow cannot be accurately predicted. Nonetheless, subsidence and subsequent fracturing in Left Fork Whitmore Canyon watershed may divert some surface flow into the ground. It is unlikely, however, that much if any, water would be diverted. Potentially, as much as 600 acre-feet of water per year could be so diverted. The amount of such diversion would decrease flow to Grassy Trail Reservoir and could be detrimental to wildlife and livestock in the area of depletion (possibly the 1.3 square miles of Left Fork Whitmore Canyon watershed that overlies the proposed mine). Diverted water eventually would be discharged, but potential points of discharge cannot be predicted from available data. The flow of Grassy Trail Creek downstream from Sunnyside may be increased by as much as 0.15 cfs after several years of mining, owing to discharge of mine water.

2) Ground water

Water use and mining below waterbearing beds would decrease or alter regional ground-water resources (part 1, chapter IV). Subsidence and associated fracturing possibly could drain waterbearing rocks above the mined coal beds (fig. 6) and increase recharge to saturated beds below the Lower Sunnyside seam. Water levels would be lowered locally and

some of the nine springs on or near the property may receive reduced flow or dry completely.

3. Air

Particulates would be the only significant contributors to air pollution at the B Canyon mine. Most coal particles would settle out within about 1 mile (1.6 KM) downwind of the mine. Increases in concentration of other pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, and photochemical oxidants would be insignificant. During the first 2-3 years, coal would be transported from the portal to rail by truck. Thereafter transport to the railroad would be by conveyor. Using AeroVironment 1977 analysis, the maximum 24-hour TSP increment is estimated to be 150 $\mu g/m^3$ within 110 yards of the unpaved but watered road carrying B Canyon mine traffic. The Federal secondary NAAQS is 150 $\mu g/m^3$. Total annual potential emissions from the mine (coal storage and transfer) and fugitive dust from truck haul on an unpaved road would be an estimated 310 tons (40 tons from mining activities and 270 tons from truck haul) and would require EPA review (chapter I, "Legally enforceable mitigating measures").

Pavement or equivalent stabilization as required in chapter I, "Legally enforceable mitigating measures," would reduce air quality and visibility impacts to insignificant levels. The maximum 24-hour incremental increase in TSP would be about 45 $\mu g/m^3$.

4. Vegetation

Approximately 100 acres of Pinyon-Juniper type and 162 acres of replanted Grassland type would be lost for the life of the mine. Little or no impact is forseen on vegetation overlying the mine. No threatened or endangered plant species would be impacted by implementing the proposal.

5. Wildlife and Fisheries

Wildlife habitat would be degraded by soil disturbance and (or) vegetation removal in constructing facilities, noise, lights, activity, and traffic associated with mine construction and operation. Habitat loss can be measured and quantified for some species, but avoidance caused by mine construction and operation cannot be precisely quantified. More visitors would disturb more sensitive species, such as black bears, mountain lions, and deer to an unknown extent. Wildlife habitat would be destroyed on 262 acres plus the amount yet to be identified for borrow-pits (table 1). There would be 228 acres of winter deer range destroyed, not including the habitat destroyed outside the limits of winter deer range. Small game and nongame mammals, bird, and reptile habitat affected would equal the 262 acres and would reduce the animal numbers somewhat. This, in turn, would affect predatory birds and mammals by reducing their food source. No base data are available to predict the impact to small game and nongame mammals and birds or predatory birds and mammals. Because of disturbance deer would be expected to avoid using 690 acres of available winter range surrounding the proposed B Canyon mine. The

zone would extend outward one-tenth of a mile from the periphery of the disturbance centers at the mine plantsite, mine fans, and from the highway. Deer feeding could be expected to be 50 percent less than elsewhere in this wintering range.

The proposed action would destroy 75 acres of winter deer range in the pinyon-juniper-mountain brush-grass complex, and disturbance would reduce use of 158 acres more (about 0.1 percent of the pinyon-juniper-mountain brush-grass complex deer winter range). Destruction of pinyon-juniper-mountain brush-grass vegetation would reduce the deer population potential in this habitat by six. Reduced use on 158 acres would reduce potential population by another five head. Additionally, 153 acres of replanted Grassland deer winter range would be destroyed, and deer would be expected to reduce use on 532 acres more (about 5 percent of the Grassland deer winter range). In summary, habitat destruction would reduce the winter range potential by 12 head, and reduced use would reduce the potential by another 21 deer. A total potential loss of 44 deer.

The loss of habitat to support potential deer and intrusion into B Canyon would probably reduce the mountain lion population potential in unit 27B by two animals, one male and one female, based on Seidensticker's findings (1973) that mountain lion home areas are relatively large and that male and female home areas overlap completely. Their sensitivity toward disturbance would probably contribute most to abandoning a home area.

Black bears would avoid the mine vicinity because of the disturbance and destruction of 75 acres of pinyon-juniper-mountain brush-grass vegetation, which includes food such as serviceberries, snowberries, elderberries, and dogwood. If the area of mining is not occupied by bear, opening of the mine definitely would preclude their use of the vicinity and the probable impacts would affect one bear.

Because chukar partridge habitat must include available water during the summer and fall, loss of springs would cause abandonment of summer-brood rearing habitat, adversely affecting chukar population. Mine dewatering could make water available for chukars in new areas and increase populations. Base data are insufficient to predict how many chukars would be affected or whether beneficial effects would offset adverse effects.

The impacts on mourning doves may prove adverse in some parts of the activity area and beneficial in others. Available water is probably the major limiting factor in dove-nesting density in the area of the B Canyon property, where doves may use the nine known springs (fig. 2). If the springs were dried, doves would abandon spring-dependent nesting habitat. As there are no known water sources near the proposed plantsite, removing trees from 75 acres would not be expected to affect nesting doves. The expected mine-water discharge could provide a key requirement for additional dove nesting. Whether the expected beneficial effects will equal the adverse effects on mourning doves is unknown.

Collisions between wildlife and vehicles along the access highway would be certain. Deer would risk crossing the highway in their daily feeding. Diurnal wildlife, such as chipmunks, prairie dogs, and ground squirrels, would chance collision with vehicles during the day, whereas nocturnal wildlife, such as jackrabbits, cottontails, mice, and snakes, would run the risk at night. Scavenging birds and mammals could then be struck by subsequent vehicles while feeding on previous road kill. Raptors and slow-moving mammals are more susceptible to vehicle strikes than more fleet species (part 1, chapter II). The loss of bald and golden eagles, accidental or otherwise, would be of serious concern. The proposed railroad, mine access highway, and power- and waterlines would cross over several miles of potential black-footed ferret range. Because no ferrets have been identified near the B Canyon developments, the impact to the animal is not known. The powerline would be a strike hazard for all birds and would increase the risk of perching raptors being shot if the powerline is within 300 yards of the road (part 1, chapter II). The presence of 150 workers and their families during the construction period would increase demand for game and fish and illegal activities related to all wildlife would be expected to increase.

B. CULTURAL ENVIRONMENT AND LAND USE

1. Land Use

About three acres would be converted to community use to accommodate the population increase of 50 new residents.

2. Range and Timber

The vegetation destroyed by the project would reduce grazing capacity by approximately 25 AUM's per year, about 1 percent of the total use on the allotment. Of greater concern is the potential impact upon cattle access across the rights-of-way and hazards from vehicles. This could reduce livestock 's ability to use what forage is available. However, the access road would aid in hauling water for cattle. A small volume of woodland products, such as fenceposts, firewood, pinyon Christmas trees, and pinyon nuts, would be lost to the project.

3. Socioeconomics

Population increase and new urbanization as a result of the estimated 50 new mine workers would require additional permanent or mobile housing (and related community services), and would increase the total regional income. Opening the mine would help maintain business economies and city and county tax bases in the East Carbon-Sunnyside, and Price areas which are partially dependent on the Geneva mine.

4. Transportation and Utilities

Effects on the present transportation and utility systems would be small, amounting to little more than a local shift in use patterns, as

Geneva mine personnel transfer to B Canyon mine. U-123 traffic could be disturbed by constructing a crossing for the proposed road and railroad spur.

5. Archeologic and Historic Values

Archeological sites may be found during the intensive surveys that will be conducted prior to development. Until such a survey is completed the extent of the impact cannot be determined. Increased population may result in more vandalism of cultural resources in the region. Improved access may result in vandalism to sites that may be present. Surveys will add to the cultural resource knowledge of the region. The one known historic site is in a poor state of repair. Any others that may be in the area of the mine proposal would likely be small and associated with mining or ranching activities. These may also be impacted. No known National Register properties would be impacted.

6. Recreation and Esthetics

A minor amount of recreation would be displaced by the proposed action (fig. 2). Recreation on the pediment south of the plantsite would increase because of improved access, but littering and vandalism would result from the increased use. Except for hunting, trapping, and ORV use, impacts to the recreation resource from increased use would be minimal, even if use increased severalfold.

Facilities and activities associated with the proposal would be viewed primarily on site. Orientation of the majority of visitors is anticipated to be toward mining and associated activities, use of adjacent areas for similar activities, and light recreation use of the area. Less than one-fourth of the visitors would have major concerns about modifying the ranching-natural landscape character to one including industrial facilities and activities. The present character of the pediment and mouth of B Canyon would be extensively modified by mining facilities and activities. Present modifications are limited to the reseeded area on the pediment, low standard roads, and the test portal entry in B Canyon. Proposed modifications of the landscape would include the paved access road, railroad, power and telephone lines, plantsite, and portal entry system.

CHAPTER IV

MITIGATING MEASURES

State and Federal laws, regulations, and administrative policies that require mitigation or reclamation of mine areas, and responsibility or requirements of the appropriate State and Federal regulatory agencies are listed in chapter III of part 1. These measures, and those in sections C and D of chapter I shall be required and are part of the B Canyon mining and reclamation plans.

The following mitigating measures could be required or implemented by the land management agency acting on behalf of the Secretary of the Interior; others could be required or implemented by the appropriate local, State or Federal agency. The effect of implementing these mitigations has not been assessed in the analyses presented in chapter V.

Supplemental irrigation and fertilizer should be available and, if necessary, should be used in restoring the disturbed areas to 90 percent of original productivity. Poorer quality topsoil could be used for fill in areas where it could be retrieved should it be needed for reclamation. Better quality topsoil should either be stockpiled or used for reclamation concurrent with construction. In places where stable cut slopes blend into the landscape and do not conflict with other planned uses, it may be more desirable to leave the cut bank rather than reconstruct a steep slope. The adjacent leveled land may be more useable and soil erosion reduced.

Visual impacts could be mitigated by establishing no more than two corridors; one for access and utilities and one for the railroad. Utility lines should be burried where possible, but if powerlines are constructed above ground, indescriminate shooting impacts to perching raptors could be reduced by building them at least 300 yards from roadways. The railroad corridor (one train per day) should not be fenced to allow livestock and big game movement. Enforcement of State and Federal rules and regulations (State Vehicle Code, Antilittering Laws, etc.) could mitigate some visual impacts caused by increased ORV use, littering and vandalism. Impacts to air quality and visibility could be mitigated by bussing the mine workers to the mine site.

CHAPTER V

ADVERSE EFFECTS THAT CANNOT BE AVOIDED

Unavoidable destruction, disturbance, and removal of paleontological resources, both exposed and unexposed, would occur. The significance of this impact cannot be meaningfully assessed because of the lack of data and evaluatory criteria. Land surface deformation from constructing surface facilities and waste disposal would not be totally mitigated by reclamation. Subsidence above mined out areas would endanger surface construction. About 27 million tons of the minable coal in the Lower Sunnyside seam would be left in place as pillars and barriers. The Upper Sunnyside seam is of minable thickness over about 1,740 acres of the property, but less than 10 percent of the acreage is minable because proximity to the lower seam makes mining unsafe. The Gilson seam is also unrecoverable. The coal left in place would be unrecoverable with present day technology.

As much as 262 acres of soil and vegetation would be disturbed, with resultant onsite impacts from erosion and loss in soil productivity during the life of the project. Where soils are disturbed and exposed, onsite erosion could increase two to three times and return to about natural rates after required erosion control and revegetation. Sediment would be collected onsite. Mining would alter ground-water flow and lower water levels at the minesite. Flow to nine springs may be reduced or diverted owing to use and disruption of the water-bearing beds. Subsidence and subsequent fracturing may reduce flows to Grassy Trail Reservoir. Required BACT would reduce the 24-hour TSP increments to about 45 $\mu g/m^3$, which is well below the secondary NAAQS of 150 $\mu g/m^3$.

Wildlife habitat would be lost because of occupancy and disturbance. Vehicle-wildlife and bird-powerline collisions would occur. These impacts would reduce wildlife numbers. The proposed mine would result in a loss of 25 AUM's of grazing capacity per year and some disruption of normal grazing patterns. Increased population in the area may result in vandalism to the cultural resources within the region. The direct impacts cannot be determined until an intensive survey is completed.

The loss of wildlife and subsequent lowering of hunting and trapping success would be unavoidable. Use of ORV's would increase, resulting in a minor loss of vegetation, soils, wildlife habitat, wildlife, and watershed values. Vandalism and littering would increase, even with increased law enforcement. The ranching-natural landscape character would be mixed with industrial (mining) character. To individuals wanting to maintain the present landscape character, this mix would be adverse.

CHAPTER VI

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The proposed B Canyon mine is planned in an area with a long history of mining and is near operating coal mines. It will replace a nearby existing mine. The work force in the existing mine will transfer to the new mine and very little change is anticipated in any nearby communities.

An undetermined number of uninventoried exposed and unexposed fossil localities could be impacted or destroyed. Knowledge of paleontological resources could be acquired from surveys and exposure of resources which might never have been found without excavation. The use of as much as 262 acres of land surface for plant facilities and access routes (table 1) would interrupt but probably not change the long-term use or productivity of the land for grazing and hunting. Subsidence of undermined areas could affect surface structures over the long term. Mining coal would reduce long-term productivity of energy resources. If improved mining methods and (or) changed economic conditions enable recovery of all or part of the estimated 27 mty of unmined coal in the Lower Sunnyside seam and the unknown amount in the Upper Sunnyside seam, long-term productivity would be restored at least partly. The deeper Gilson seam is generally less than 4 feet thick (fig. 6) and is not minable by present methods.

During the life of the mine soil productivity would be lost on as much as 262 acres of land (table 1), but most would be rehabilitated after mining. Land occupied by transportation systems (about 25 acres) could be out of production for the long term. Over the short term, vegetation and associated range forage and woodland products would be lost. Reclamation would restore vegetation in about 5 to 10 years after mining. The decreased wildlife population potential would be short term. Human encroachment through new routes could continue to depress wildlife productivity over the long term. Transportation impacts are likely to be short term, for the most part ending with mining. However, retention of the access road is likely after mining, as it would provide access for other purposes. The railroad is likely to be salvaged for materials, but the roadbed probably would remain and become a permanent landscape feature. The utility lines also are likely to be permanent, serving future development.

Any archeological sites disturbed during development of the site would result in a long-term impact to the in-place value of that site. Collection of sites that might be found will ensure recording of information that otherwise could be lost to natural forces or vandalism. The short-term use of the area for mining would not appreciably reduce the opportunity for recreation. Improved access would generate additional recreation in the area on a long-term basis. The present landscape would be modified to include industrial development and activities. After mining and reclamation, the paved access route and minor residuals of mining would remain and would constitute a permanent minor modification of the ranching-natural landscape character of the area.

CHAPTER VII

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An undetermined number of uninventoried exposed and unexposed fossil localities would be impacted or lost. About 21 million tons of coal would be mined and consumed as a nonrenewable resource and about 27 million tons would remain in place an unmined pillars, fire barriers and other roof-supporting structures. This unmined coal and an additional unknown amount of coal would be irretrievable unless and until suitable recovery methods can be developed.

Soils disturbed by mining projects, transportation systems, and community development would be permanently altered from their natural characteristics. Energy and materials used in reclamation would be irreversible and irretrievable commitments. Changes in ground-water flow patterns resulting from mining and subsequent subsidence would be irreversible.

Emissions from secondary growth and its related activity such as traffic, urban fuel consumption, etc., induced by the proposed action would be permanent and result in a long-term commitment of the air to some deterioration.

Plants now growing on the areas to be disturbed, along with the grazing capacity and woodland products, would be irretrievably lost. Twenty-five AUM's per year for 25 years total 625 lost AUM's. A small volume of fenceposts, pinyon Christmas trees, firewood, and pinyon nuts would be lost. If the access road and railroad are not reclaimed, these areas would be irretrievably lost. Proper reclamation of the disturbed areas will prevent irreversible commitment of grazing and vegetal resources. Individual wildlife and habitat loss would be irretrievable.

Unsalvaged materials in the road, railroad, and waterline would constitute an irretrievable commitment of resources, as would the use of energy in construction. Irreversible and irretrievable commitment of resources by transportation would consist of the energy and materials to transport the coal and the mine workers. Based on national data, train haul over 19 miles would require 10^9 Btu to transport 10^{12} Btu of coal. Mine workers commuting an average of 7.1 miles one way over at least 25 years would travel 12.9 million miles and consume half a million gallons of gasoline. More than 80 cars and light trucks per hour would be using the access road during commuting hours.

Any cultural resources located in the immediate project area could not be preserved in place. If the paved access road remains in place after mining and reclamation, the area would be irreversibly committed to additional recreation use. Loss of hunter success during the life of the mine would be irretrievable. It would, however, be reversible, through applied management practices (limited-controlled hunts) after mining ceases. The area will revert to near the present landscape character after mining and reclamation, except for some incidental residuals and the main access road. The present ranching-natural landscape character would not be totally retrievable.

CHAPTER VIII

ALTERNATIVES

Approval of the applicant's mining and reclamation plan, as submitted, has been analyzed as the proposed Federal action in this statement. Alternatives to that course of action are discussed below.

A. NO ACTION

Pursuant to implied covenants of both the Federal mineral leasing laws and the existing lease agreements, the Secretary of the Interior must respond to a legitimate application to conduct operations on a valid Federal lease, provided all terms and conditions of the lease have been met. The Secretary's response may be approval as proposed, rejection on various legitimate grounds, or to defer decision based on proper grounds. "No action" on the applicant's proposed mining and reclamation plan would mean maintaining the status quo on the leasehold. The impacts of taking no action would be the same as described subsequently under the alternative "Reject the Mining and Reclamation Plan."

The proposed B Canyon mine and the operating Geneva mine are in the part of the Book Cliffs coal field that produces coking coal. The company controls no other undeveloped coal resources in this area, and company officials have stated that no other sources of coking coal are known in Utah. If the application to develop the B Canyon property should be denied, the company would have to find a source of coking coal elsewhere. Over time the Geneva mine would close and the population of East Carbon-Sunnyside-Dragerton would be reduced about one-third. Impacts would be shifted to a new source area for coking coal.

Unemployment of approximately 200 personnel would have a significant secondary economic impact to businesses in the East Carbon-Sunnyside-Dragerton area. Needs for elementary school instructional personnel and other supportive personnel would be less. About 10 percent of the permanent homes could be vacated.

B. DEFER FEDERAL ACTION

In the event of noncompliance of the applicant's proposed mining and reclamation plan to provisions of the Surface Mining Control and Reclamation Act of 1977, the Secretary must defer action on the proposed plan. For other causes, he may also defer the decision. Such causes could include, but are not limited to, the time required and the need for the following:

- Modification of the proposal to correct deficiencies unrelated to SMCRA or to reduce or avoid environmental impact.
- Acquisition of additional data to provide an improved basis for technical or environmental evaluation.
- Further evaluation of the proposal and (or) alternatives.

. Development of an adequate system to monitor impacts for management and regulation.

The principal effect of deferring action would be a short-term delay in the imposition of all related impacts, both adverse and beneficial, of the applicant's proposal discussed in this statement.

Action could also be deferred unitl the plan is modified to include one or more of the alternatives discussed below in subsection E. These alternatives if implemented would reduce or avoid some environmental impacts of the proposed action.

C. PREVENT DEVELOPMENT OF THE LEASE

1. Reject the Mining and Reclamation Plan

The Secretary may reject a proposed plan that does not meet the prescriptions of applicable law and regulations under his authority, including the potential for environmental impact that could be reduced or avoided by adoption of a significantly different course of action by the applicant. Except when a mine plan does not comply with existing regulations, the Secretary cannot under present circumstances reject the proposed plans to the extent that a de facto cancellation of a lease results unless he seeks and obtains additional authority from the Congress. Viability of this option is dependent upon timely legislative action; the option of rejecting the proposed plans pending legislation remains available.

If the Secretary were to reject the mining and reclamation plan, the lease would not be mined, and impacts previously discussed would be deferred until an acceptable plan was approved. The lease would continue in its present condition, subject to modification by natural processes and by the continuation of other existing activity and uses--and to further modification by the surface owner to meet other uses. However, the development of alternative sources of energy, such as other coal mines in the county, or a reduction of national energy consumption, could result. The applicant could correct the deficiencies in the plan and resubmit a modified mining and reclamation plan for approval. The result would be similar to that described in the alternative "Defer Federal Action."

If prevention of further development of existing leases were accomplished, substantial quantities of coal known to be present would be left in place and not recovered for use. To replace the resources foregone by this alternative course of action, additional coking coal mines would have to be developed on company controlled property in northwest Colorado to supply the requirements of the steel plant in Provo, Utah. This would require about 250 additional miles of rail haul.

2. Seek Legislation to Cancel the Lease

The Secretary has very limited authority with respect to cancellation of an existing Federal coal lease. One such authority is prescribed in the lease terms entitled "Proceedings in Case of Default."

A second authority was mandated by provisions of sec. 6 of the Federal Coal Leasing Amendments Act of 1975 (P.L. 94-377) which was subsequently written into regulations as 43 CFR 3520.2 The authority relates to failure of the lessee to meet the requirements for diligent development of the lease as defined by the Act.

The authority to cancel on other grounds would require congressional authorization for such action as well as for the requisite funds for compensation to the lessees. The Administration has not requested such legislation, and the Congress has not initiated such legislation related to the matters considered in this statement. The possibility of such actions is a matter for further consideration by the Administration and the Congress in the light of this environmental statement and other relevant nonenvironmental concerns.

To the extent that future coal production from this lease was curtailed or halted, alternative sources of energy would be required to meet anticipated needs and demands. The time required to replace the coal production potential could range from a few to several years. If this lease were cancelled through congressional authorization, all physical, biologic, and socioeconomic impacts stemming from the proposed mine would be avoided. Conversely, if development eventually were authorized, environmental impacts as discussed previously in this statement would occur, although impacts would be deferred in time and perhaps reduced because of changes in technology or requirements imposed at that time.

3. Exchange the Existing Lease

If the Secretary determines it to be in the public interest, he may initiate a proposal to the lessee for exchange of the existing Federal lease involved in this proposal for lease of other tracts of Federal coal or tracts of Federal sodium, phosphate, potash, or sulfur of comparable value, or for a grant of various future rights.

The Department of the Interior considers that the public interest would be so served if the Secretary finds that the benefits of production from the lease would not outweigh the adverse effects, or threat of damage of destruction to agricultural production potential, or scenic, biological, geologic, historic or other public interest values from lease operations. In exercising his discretion to exchange mineral leasing values in the public interest, the Secretary shall consider, but is not limited to, consideration of these elements of the public interest: recreational use; archeological or historic values; threatened or endangered species; proximity of residential or urban areas; study for potential inclusion in the wilderness or wild and scenic rivers systems; and value for public highways, airports, and rights-of-way.

Should the Secretary initiate such a proposal, the lessee is under no obligation to enter into such negotiations and may refuse to consider it.

If such a proposal is made and is rejected by the lessee, or if negotiations are entered and not agreeably concluded by the parties, and

if the operations described in this statement are not otherwise prevented, such operations would eventually proceed and result in the impacts identified therein.

If an exchange proposal is made, accepted, and agreeable concluded for coal that is contiguous or very near to the existing lease, the proposed plan would have to be revised, resubmitted, and assessed. If the new plan encompasses the same methodology to be used in coal development, many of the impacts described herein would likely be very similar to those resulting from the new proposal, with a relatively short-term delay (several years) in their initiation. If a wholly different methodology is proposed for development of the replacement lease (e.g., underground versus surface mining), it could be substantially different from those described in this statement, and cannot be forecast at this time.

Presumably the unacceptable impacts or effects prompting the exchange would be avoided or substantially reduced in development of the replacement lease and found to be in the public interest. The existing lease would be relinquished, would not be mined, and would continue in its present condition as discussed below.

If an agreeable exchange were made for coal located elsewhere, or for a different mineral commodity located elsewhere, the relinquished lease would continue in its present condition, subject to modification by natural processes, by the continuation of other existing uses and activity, and to further modification by the surface owner to meet other uses. Potentially, the coal reserves relinquished would be withdrawn from development and this source of energy foregone. Direct financial benefits to the public may change in an exchange of leases.

The impact of exploration and development of the replacement lease under these circumstances will be translocated in space and time. They will relate to time and location, physical environment at the new site, mineral commodity involved, development technology proposed and approved, and other factors, none of which can be quantified or evaluated until the replacement lease is identified. The environmental impact of potential development of the replacement lease rights to be granted would be evaluated and considered in the exchange process, and while they may be greater or less than those described in this statement, they must be ultimately judged by the Secretary to be more environmentally acceptable than development of the relinquished lease,, and to be in the public interest. Costs to the Department in identifying and evaluating one or more replacement tracts to be offered in the exchange could be substantial, and very likely be significantly more than the lessee's costs in establishing the fair market value of the tract to be relinquished.

4. Suspend Operations

The full development of existing leases could be delayed by suspension of operations. If such action were taken, there would be no additional incremental environmental impact on the area, and it would continue in

its present condition, subject to further modification by natural processes, the continuation of existing mining activity, and such future uses of the surface as the owners may decide.

The authority of the Secretary of the Interior to suspend operations on existing leases has already been utilized on other Federal leases. Suspension of operations of this existing lease, for reasonable periods, with proper grounds, could be imposed. The Secretary cannot, under present circumstances, suspend operations to the extent that a de factor cancellation of a lease results unless he seeks and obtains additional authority from Congress. Viability of this option is dependent upon timely legislative action; the option of suspending operatins pending legislation remains available. Impacts of this alternative would be similar to those described under "Cancel the Lease."

5. Federal Reacquisition of Leased Rights

The outstanding leasehold interests could be acquired by the Secretary. The ability to acquire the leasehold interests is not granted by the existing relevant statutes and would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees. To date, the Administration has not requested such action, and the Congress has not initiated or considered such legislation; the possibility thereof is thus conjectural at best. The major effects of such Congressional authorization would be similar to those of cancellation of the leases as previously discussed.

D. RESTRICT DEVELOPMENT ON THE LEASE

The subject leases convey the right to develop, produce, and market the Federal coal resource thereon if all other terms and conditions have been met by the lessee. In general, the Secretary does not possess the authority to arbitrarily restrict development either as to location or rate. Various measures that may tend to restrict development may be taken by the Secretary at any time in the interest of conservation of the resources or in the protection of various specific environmental values in accordance with existing laws and regulations; for example, the National Historic Preservation Act of 1966, the Endangered Species Act of 1973, etc.

Thus, under present conditions, a general effort to restrict or regulate development of the existing lease for reasons other than failure to comply with existing laws and regulations would constitute a selective application of the "prevent development" alternative already discussed; that decision, as it relates to impacts, possible litigation, and the need for authorizing legislation, would be relevant in this instance.

In addition, application of this alternative might not permit maximum recovery of the coal resources and would thus be contrary to principles of conservation embodied in the legislation which authorizes the leasing of these lands for the purposes described. It is entirely possible that

such selective mining would leave isolated blocks of coal that might never be recovered owing to the high costs of mining such remnant areas at a later date.

E. REQUIRE MODIFICATION OF THE MINING PLAN

1. Company-Proposed Alternatives

Impacts of the alternative transportation and utility routes (table 2 and fig. 8) would be about the same as for the primary proposals (fig. 6). The routes eventually chosen would depend on engineering and economic factors.

TABLE 2.--Summary company-proposed alternative transportation and utility routes

[See fig. 8]

	Right-of-way			Surface disturbance (acres)
	Miles	Width	Acres	
Highway----------	5.13	100 ft	62.2	40.4
Railroad spur-------	7.48	100 ft	90.7	90.7
Telephone line------	4.36	30 ft	15.9	4.2
Water pipeline------	5.17	20 ft	12.5	12.5

2. Federal Proposed Alternatives

a. Truck-haul coal to Wellington

Although not as energy efficient as rail transport, hauling to the Wellington washing facility is less capital-intensive, especially in the early years of operation. Hauling coal 19 miles to the washing facility would require 154, 25-ton trucks. This would increase traffic on U-123 to 289 heavy trucks (6-wheels and over) and 895 cars or light trucks per day. West of its junction with U-123, US Highway 6 in 1975 carried 479 heavy trucks and 2,690 cars or light trucks per day. Thus, truck haulage to Wellington from the B Canyon mine would more than double heavy truck traffic on U-123 and add about half again as much heavy truck traffic on US Highway 6. Exhaust emissions and TSP from fugitive dust would be increased over the primary proposal.

Impacts on vegetation and grazing would be reduced by the area used for constructing the proposed railroad. Approximately 8 AUM's per year would be gained over the original proposal. More traffic on the haul road would reinforce the need for large animal crossings. Other impacts and uses would remain similar to the basic proposal.

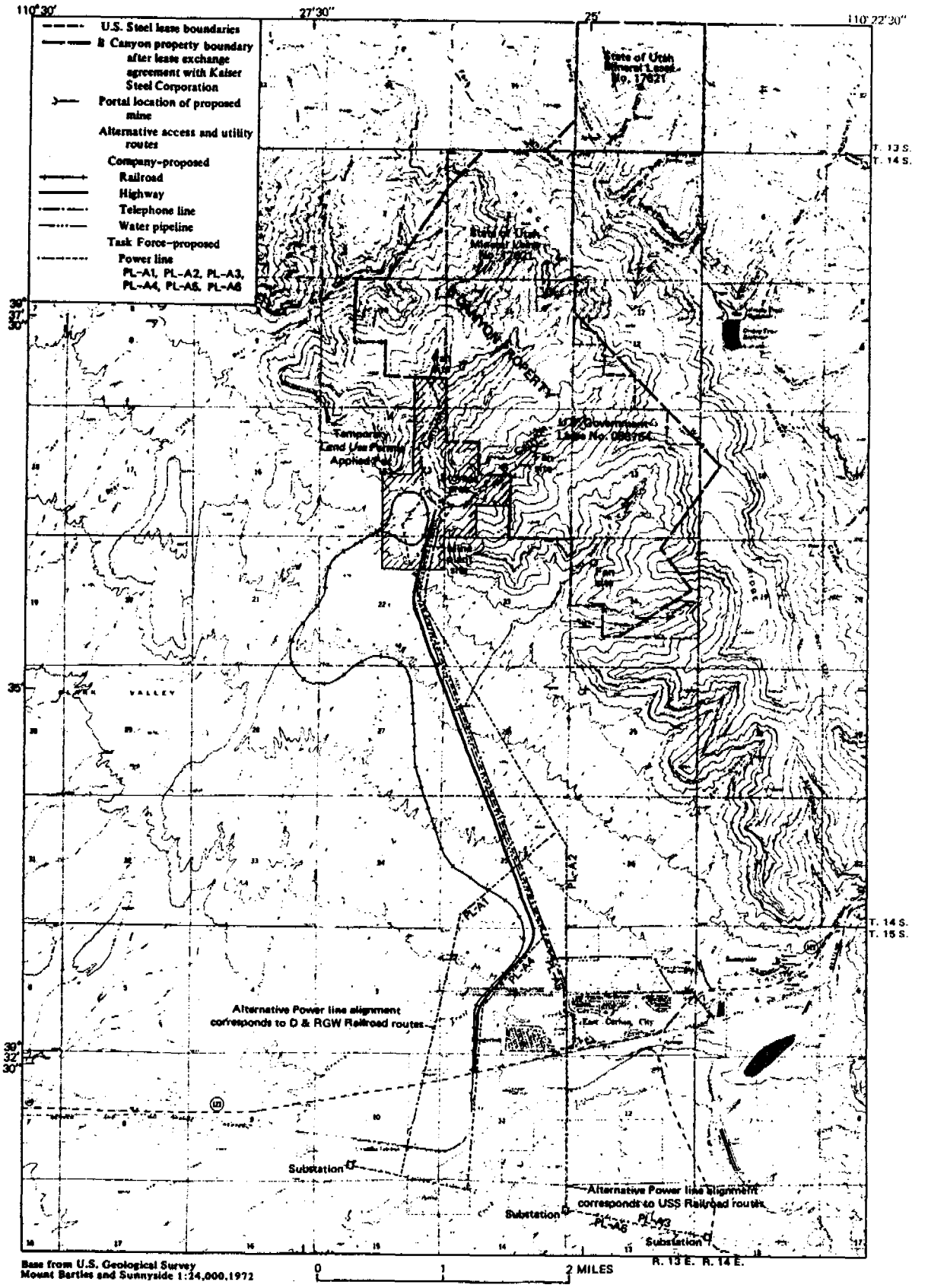


FIGURE 8.--Alternate access and utility routes.

b. Convey coal by rubber-belt

A conveyor-belt system from the B Canyon plant to the present railhead near East Carbon has been suggested as an alternative to truck or railway haul. However, a conveyor belt would still require a good access road from Dragerton and Sunnyside to the minesite. Total TSP emissions would be less than those expected from the primary proposal. The conveyor, nevertheless, would impact the esthetic resource more; partly restrict recreation user access; and impede big game movement.

c. Commuter transport by bus

Commuter traffic, estimated to be 300 vehicles per day, can be reduced somewhat by providing bus service to the mine from the Dragerton-East Carbon-Sunnyside area. Three 45-passenger busses (or a commensurately larger number of smaller busses), each making two trips per day, could carry the total anticipated employees. In practice, however, some employees' homes are too scattered for efficient bus transport, and others would drive even if bus service were available. The number of employees who would or could use bus service is unknown. Commercial bus service probably could not operate profitable without company subsidy. An alternative would be company-operated buses.

TABLE 3.--Length and acreage of primary and alternate proposed utility routes, B Canyon mine, Carbon County, Utah

	Length miles	Right-of-way acreage required			Total acres
		Federal	State	Private	
Powerline as proposed (fig. 2)	5.30	54.1	0	10.1	64.2
Powerline alternatives (fig. 7):					
PL-A1[1]	6.40	55.7	0	19.4	75.1
PL-A2[1]	5.82	43.2	9.1	18.3	70.6
PL-A3[1]	7.38	49.4	9.1	21.5	80.0
PL-A4[2]	6.60	45.0	0	29.6	74.6
PL-A5[2]	5.63	49.6	0	18.8	68.4
PL-A6[2]	7.19	55.8	0	22.0	77.8
Water pipeline as proposed (fig. 2)	4.89	7.6	1.4	2.6	11.6
Water pipeline, alternative (fig. 7)	5.17	8.4	0	4.1	12.5
Telephone line as proposed (fig. 2)	4.56	13.1	0	3.5	16.6
Telephone line, alternative (fig. 7)	4.36	12.2	0	3.7	15.9

[1]Parallel to proposed highway, in part, extending to different substation locations.

[2]Parallel to alternate highway route, in part, extending to different substation locations.

d. Corridorize utility lines

Except for the railroad, which has severe grade limitations, all access to the B Canyon property would fit into a single corridor at the north end (as proposed by the company) and could be changed in alinement to fit into a single corridor at the south end (not proposed).

The company-proposed access-utility routes and alternative routes, respectively, are shown in figures 2 and 8. Three Federal proposed alternative powerline routes (PL-A1, PL-A2, PL-A3) parallel the proposed access highway in the north and extend to different substations on the present powerline. Three alternative routes (PL-A4, PL-A5, and PL-A6) parallel the alternative access highway in the north and extend to the same substations on the present powerline. Lengths and acreages of the alternative powerline, telephone, and water pipeline routes are given in table 3, with the length and acreage of the proposed route for comparison.

Another alternative, not shown in figure 8, would extend the waterline along U-123 from the waterplant to the west line of sec. 1, T. 15 S., R. 13 E., where it would join the telephone and powerline alternatives in the same corridor. The length of this alternative, would be about the same as that of the company's alternative, if the alternative utility corridor were used.

The primary advantage of these task force-proposed alternatives is that some rights-of-way could be combined and, in some cases, the total amount of acreage could be reduced. The water and telephone lines could be placed in the same right-of-way and, where parallel and adjacent to the access highway, could be set within the access highway right-of-way. Results are shown in table 4. It is inadvisable to combine the powerline into this composite right-of-way because of the probability of causing eddy currents in telephone and buried pipelines, although the powerline could effectively parallel the other two. Consequently, the powerline right-of-way is not included in anticipated reduction of required acreage.

TABLE 4.--Comparison of length and acreage proposed and alternative utility routes

Feature	Miles by land ownership				Acres by land ownership			
	Federal	State	Private	Total	Federal	State	Private	Total
Corridorization of proposed layout:								
Road-water-telephone	2.71	0	0	2.71	37.0	0	0	37.0
Additional road	1.23	0	1.25	2.48	16.8	0	16.0	32.8
Water-telephone	0.45	0.62	1.11	2.18	1.6	2.3	4.0	7.9
Additional waterline	0	0	1.19	1.19	0	0	2.9	2.9
Totals	4.39	0.62	3.55	8.56	55.4	2.3	22.9	80.6
Rights-of-way as proposed	10.71	0.62	3.44	14.76	74.6	1.5	22.6	98.6
Decrease in right-of-way needed	6.32	0	[1]-0.11	6.20	19.2	[1]-0.8	[1]- 0.3	18
Corridorization of alternative layout:								
Road-water-telephone	3.50	0	0	3.50	44.8	0	0	44.8
Additional road	0	0	1.33	1.33	0	0	16.1	16.1
Water-telephone	0	0	1.75	1.75	0	0	6.4	6.4
Additional waterline	0	0	1.19	1.19	0	0	2.9	2.9
Totals	3.50	0	4.27	7.77	44.8	0	25.4	70.2
Alternative rights-of-way as proposed	10.37	0	4.09	14.46	65.6	0	24.0	89.5
Decrease in right-of-way needed	6.87	0	[1]-0.18	6.69	20.8	0	[1]- 1.4	19.3

[1]A negative sign indicates that more length or area would be used in corridorization than would be used in the proposal or in the alternative, in the indicated category.

CHAPTER IX

CONSULTATION AND COORDINATION WITH OTHERS

A. FEDERAL AGENCIES

In addition to agencies that cooperated in preparation of this statement, local Soil Conservation Service and National Weather Service personnel were consulted.

B. UTAH STATE AGENCIES

Also consulted for data and analysis were: Geological and Mineralogical Survey, Division of Water Resources, Division of Water Rights, State Engineer, State Climatologist, Division of Wildlife Resources, Division of State Lands, Division of Parks and Recreation, Outdoor Recreation Agency, and Institute for the Study of Outdoor Recreation and Tourism, Utah State University, Logan, Utah.

C. COUNTY AND LOCAL GOVERNMENT

The Southeastern Association of Governments and other local governmental offices were consulted during preparation of the EIS.

D. PRIVATE INDIVIDUALS AND ORGANIZATIONS, INDUSTRY AND NONINDUSTRY

United States Steel Corporation
Vaughan Hansen Associates

E. GENERAL CONSULTATION AND COORDINATION

The regional environmental impact statement (EIS), chapter IX, contains a description of the general consultation and coordination efforts involved in the preparation of the total EIS.

CHAPTER X

REFERENCES

AeroVironment, Inc., 1977, Assemblage of data on air quality in central and southern Utah and assessing the impact of coal development in this region on the air quality: Pasadena, Calif., Final Report.

Amstrup, S. C. and Beecham, J., 1976, Activity patterns of radio-collared black bears in Idaho: Jour. of Wildlife Management, v. 40, no. 2, p. 340-348.

Caldwell, L. D., 1964, Dove production and nest site selection in southern Michigan: Jour. of Wildlife Management, v. 28, no. 4, p. 732-738.

Clark, T. W., 1976, The black-footed ferret: Oryx, v. 13, no. 3, p. 275-280.

Dalton, L. B., Farnsworth, C. B., Smith, R. B., Wallace, R. C., Wilson, R. B., and Winegardner, S. C., 1977, Species list of vertebrate wildlife that inhabit southeastern Utah: Salt Lake City, Utah, Utah Division of Wildlife Resources, (in press).

Doelling H. H., 1972, Book Cliffs coal field, in Doelling, H. H., Central Utah coal fields: Utah Geol. and Mineralog. Survey, Mono., ser. 3, p. 245-416.

Dunrud, C. R., 1976, Some engineering geologic factors controlling coal mine subsidence in Utah and Colorado: U.S. Geol. Survey Prof. Paper 969, 39 p.

Environmental Protection Agency (EPA), 1978, Memorandum 8EA: Denver, Colo., USEPA Region VIII.

Hagihara, J. S., Rice, C. M., and Langan, L. N., Interim Guide for Rating Soils According to their Soil Suitabi Seeding-Nevada, Technical Note, Filing Code 7312.3, U.S. Department of the Interior, Bureau of Land Management, January 5, 1972.

Hinckley, D. K., 1970, A progress report on attempts to locate black-footed ferrets, Mustella nigripes, in Utah: Division of Wildlife Services, U.S. Fish and Wildlife Service, 10 p.

Jonkel, C. J. and Cowan, I. McT., 1971, The black bear in the spruce-fir forest: Wildlife, Mono. no. 27, 57 p.

Pacific Southwest Inter-Agency Committee, 1968, Report on factors affecting sediment yield in the Pacific Southwest area: Water Management Subcommittee, Sedimentation Task Force.

Pierson, L. M., 1977, Report of archeological activities - B Canyon coal lease: Salt Lake City, Utah, prepared for K. K. Pelli Co., 12 p.

Roy Mann Associates, Inc., 1977, Visual resource inventory and evolution of the central range and coal region of Utah: prepared for Bureau of Land Management.

Scott, R. W., Boner, T. C., and Smith, R., 1977, Ranking of wildlife values on Federal coal lands: Utah Div. of Wildlife Resources (in print).

Seidensticker IV, J. C., Hornocker, M. G., Wiles, W. Y., and Messick, M. P., 1973, Mountain lion social organization in the Idaho Primitive Area: Wildlife, Mono. no. 35, 60 p.

U.S. Department of Interior, 1977, Broken "H" Ranch Company (2): U.S. Dept. of Interior Board of Land Appeals, 77-485, Docket vol. 33, p. 386-391.

Utah State Department of Fish and Game, 1967, Utah big game range inventory, 1966: 171 p.

Welsh, S. L., 1977, Endangered and threatened plant species of the central coal lands, UTah: Provo, Utah, Brigham Young University, 48 p.

S I T E S P E C I F I C A N A L Y S I S

Belina No. 2 Mine

O'Connor Mine

On all or parts of lease Nos. U-017354, U-067498, U-073120, U-020305, and U-044076

Proponent: Valley Camp of Utah, Inc.

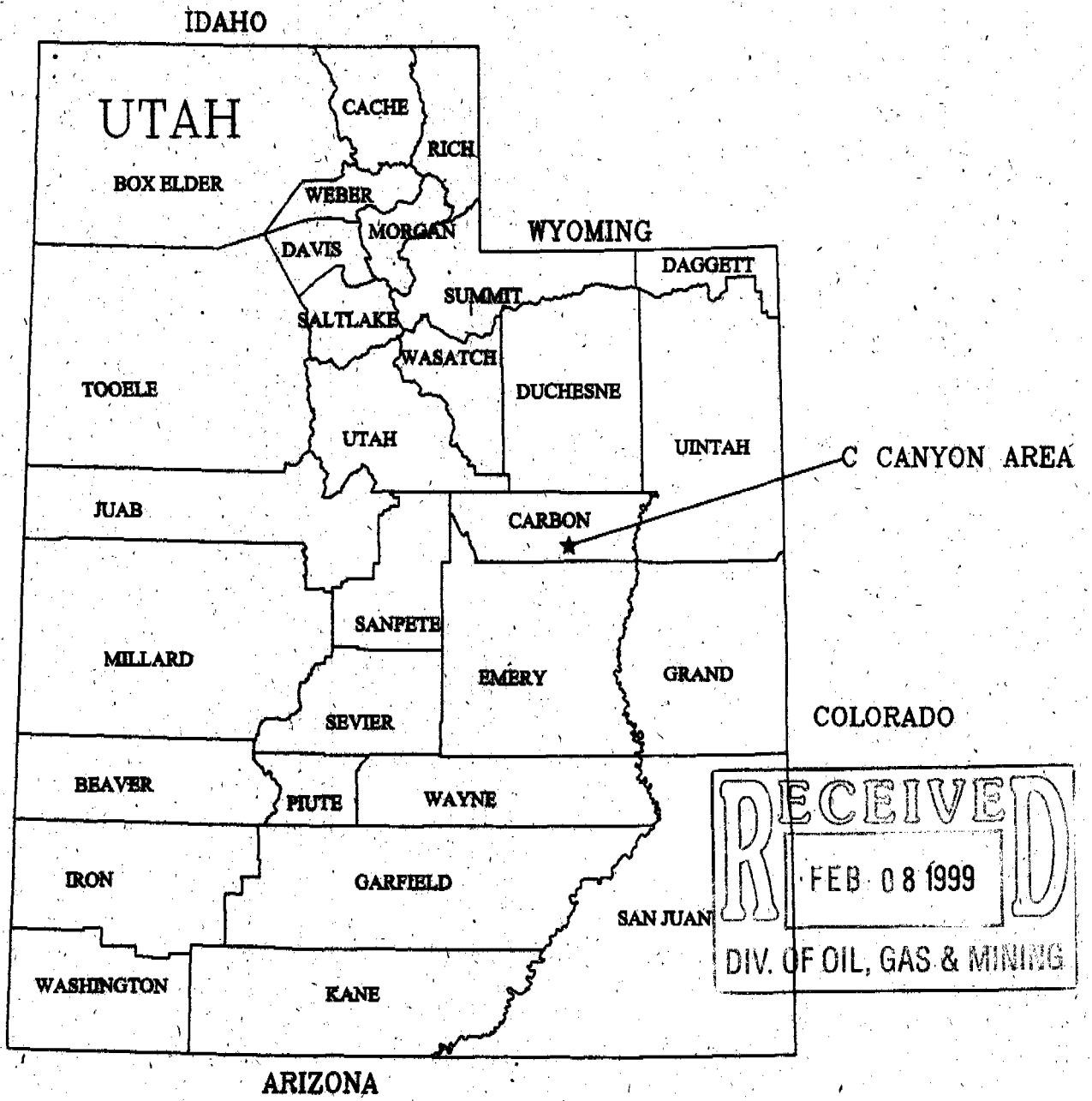
U.S. Department of the Interior
Bureau of Land Management
Moab District Office
Price Field Office

UTAH

Pro1007041

May 1998

Environmental Assessment for
Carbon County Development of the C Canyon Road
and
WEST RIDGE Resources, Incorporated
Development and Surface Operation of the West Ridge Mine
Development of the C Canyon 69 kV Powerline
Development of the C Canyon Telephone Line
Development of the C Canyon Water Line
and
East Carbon City Development of the C Canyon Water Line



ENVIRONMENTAL ASSESSMENT

For

CARBON COUNTY
DEVELOPMENT OF THE C CANYON ROAD

WEST RIDGE RESOURCES, INCORPORATED
DEVELOPMENT AND SURFACE OPERATION OF THE WEST RIDGE MINE
DEVELOPMENT OF THE C CANYON 69 kV POWER LINE
DEVELOPMENT OF THE C CANYON TELEPHONE LINE
DEVELOPMENT OF THE C CANYON WATER LINE

And

EAST CARBON CITY
DEVELOPMENT OF THE C CANYON WATER LINE

In

CARBON COUNTY, UTAH

RESPONSIBLE AGENCY

USDI, Bureau of Land Management
Price Field Office
125 South 600 West
Price, Utah 84501
(801) 636-3600

MAY 1998

TABLE OF CONTENTS

LIST OF EXHIBITS

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AUM	animal unit month
BLM	Bureau of Land Management
BP	Before Present
cfs	cubic feet per second
dBA	decibels of the A-weighted scale
ESA	Endangered Species Act
fps	Feet per Second
gpm	Gallons per Minute
KOP	Key Observation Point (VRM Class)
kV	kilovolt
MFP	Management Framework Plan (BLM)
MRP	Mine Reclamation Plan
NAS	National Academy of Science
NEPA	National Environmental Protection Act
NHPA	National Historic Preservation Act of 1986
NRCS	Natural Resource Conservation Service
OSM	Office of Surface Mining
pfs	Pounds per Square Foot
R	Range
ROW	right-of-way
SLB&M	Salt Lake Base and Meridian
SPCC	Spill Prevention Control and Countermeasure Plan
T	Township
TDS	Total Dissolved Solids
TES	Threatened, Endangered and Sensitive (Species)
UDES	Utah Department of Employment Security
UDWR	Utah Division of Wildlife Resources
UDOGM	Utah Division of Oil, Gas and Mining
UNPDES	Utah Nonpoint Discharge Effluent Source
UP&L	Utah Power & Light
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USHPO	Utah State Historic Preservation Office
VRM	Visual Resource Management

GLOSSARY OF TERMS

Access	Passage to proposed site
Alternative (action)	An option to meeting the stated need
Archaeology	The science that investigates the history of peoples by the remains belonging to the earlier periods of existence.
Assessment(environmental)	An evaluation of existing resources and potential impacts to them from a proposed act or change to the environment.
Commitment (mitigation)	Obligation to a measure that would diminish the severity of an impact.
Community (biological)	A group of one or more populations of organisms that form a distinct ecological unit. Such a unit may be defined in terms of plants, animals or both.
Contrast	The effect of a striking difference in the form, line, color, or texture of an area being viewed.
Cultural resources	Any site or artifact associated with cultural activities.
Distribution Line	A line that carries low voltage and high amperage for short distances. Since it has the ability to be transformed into low voltages, the distribution line is usually used for residential and small commercial facilities.
Endangered species	Any species in danger of extinction throughout all or a significant portion of its range. This definition excludes species of insects that the Secretary of Interior determines to be pests and whose protection under the Endangered Species Act of 1973 would present an overwhelming and overriding risk to man.
Environment	The surrounding conditions, influences, or forces that affect or modify an organism or an ecological community and ultimately determine its form and survival.
Ephemeral (streams)	Flowing in response only to direct precipitation, and whose channel is at all times above the water table, and restricted to streams that do not flow continuously for at least 30 days.

Erosion	The group of processes whereby earth or rock material is loosened or dissolved and removed from any part of the earth's surface.
Habitat	A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover and living space.
Hydrology	The science that relates to the water of the earth.
Impact	A modification in the status of the environment brought about by the proposed action or alternative action.
Interdisciplinary team	A group of people with different training representing the physical sciences, social sciences and environmental design arts assembled to solve a problem or perform a task. The members of the team proceed to solution with frequent interaction so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new solutions.
Landscape	That which makes up the various attributes of land surface as a result of geologic activity and weathering, such as plateaus, mountains, plains and valleys.
Mitigation	To alleviate or render less intense or severe.
Paleontology	The science that deals with the life of past geological ages through the study of the fossil remains of organisms.
Public Lands	Federally owned lands administered by the Bureau of Land Management.
Raptor	A bird of prey.
Right-of-way	Public lands authorized to be used or occupied pursuant to a right-of-way grant.
Riparian	Any area of land directly influenced by permanent water that has visible vegetation or physical characteristics reflective of permanent water influence. This can include streams, springs, seeps, wet meadows, aspen stands, and similar habitats.

Significant (impact)	Impact that would cause a substantial adverse change or stress to one or more environmental resources. In general, all potential high impacts are considered to be significant, but in some cases potential moderate impacts are considered significant.
Species	A group of individuals of common ancestry that closely resemble each other structurally and physiological and in nature interbreed producing fertile offspring.
Threatened species	Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.
Visual Resources	Classification of landscape according to the kinds of structures and changes that are acceptable to meet established visual goals (BLM VRM).

CHAPTER I. INTRODUCTION

A. NEED FOR THE PROPOSED ACTION

WEST RIDGE Resources, Inc. (WEST RIDGE) currently holds 2,570.67 acres of federal coal leased under serial number SL-068754 in the Book Cliffs coal field in Carbon County near East Carbon and Sunnyside, Utah (PLATE I and II). In order to access and mine the coal reserves present within this lease, WEST RIDGE would need to construct and operate a mine facility within C Canyon. To facilitate the construction and operation of a surface facility in C Canyon, an 80 acre lease area modification would need to be acquired. Currently, the area below C Canyon and along Clark Valley is accessed by numerous unmaintained dirt roads. These existing roads are inadequate to facilitate the proposed haulage of approximately three million tons of coal annually from the proposed mining operation, along with the associated personnel, vendors and supply vehicles a mine of this magnitude would necessitate.

The proposed action would be a result of a cooperative agreement with Carbon County and WEST RIDGE to provide the necessary, road system so that the coal resources could be mined and transported in a competitive marketplace. The benefit to Carbon County in increased employment and subsequent royalties from federal coal leases define a realistic need for all parties. Agreements between WEST RIDGE, PacifiCorp dba: Utah Power & Light (UP&L), U.S. West and East Carbon City would provide for the associated utility and power needs required to adequately mine and transport the proposed coal production.

B. AUTHORIZING ACTIONS AND PERMITS

Conformance With Existing Land Use Plans

The proposed action, located within Bureau of Land Management (BLM), State of Utah and private jurisdictions, is in conformance with federal, state and local requirements. The proposed action is in conformance with the BLM Price River Resource Area Management Framework Plan (MFP), approved in 1983 and as amended.

The area of the proposed action is zoned as MG-1, mining and grazing, by the Carbon County Zoning and Planning Office, and is in conformance with the existing land use plan for the county.

Permits

The granting of rights-of-way (ROW) by the BLM is pursuant to the requirements of Title V of the Federal Land Policy and Management Act of 1976, and regulations found within Title 43 of the Code of Federal Regulations, part 2800.

Carbon County and WEST RIDGE would be required to obtain a number of permits and approvals from federal and state agencies for the project. These are listed on TABLE I-1.

TABLE I-1

PERMITS AND OTHER LEGAL REQUIREMENTS

Agency	Act or Regulation	Requirement
Federal		
Council for Environmental Quality	National Environmental Policy Act of 1969 (NEPA), as amended (40 CFR 1500) Public Law 91-90, 42 U.S.C. 4321	Environmental Assessment, Right-of-Way, Notice to Proceed, Temporary Use Permits, and Consultation.
Bureau of Land Management	Federal Land Policy Act of 1976 (FLPMA) (43 CFR 2800 & 3100) Public Law 94-579 (10/21/76)	Lease Modification
Fish and Wildlife Service	Endangered Species Act of 1973 (ESA) (16 U.S.C. 1539)	Provide biological opinion of wildlife and plants that are federally listed, and impacts of the proposed action to listed species.
	Migratory Bird Treaty Act (16 U.S.C. 703-711)	Consultation and review of impacts to listed species.
	Bald Eagle Protection Act (U.S.C. 663a)	Consultation and review of impacts to golden eagles.
Utah State		
Office of Rehabilitation		
School & Institutional Trust Lands	Permit for Materials and Easement	Consider issuance of permit for easements and borrow material.
Department of Transportation	Permit to Encroach Road Easement	Consider issuance of permit to intersect state road ROW.
	Permit to Cross a Road Easement	Consider issuance of permit for crossing of road ROW.
Department of Natural Resources		
Division of Oil, Gas and Mining	Permit for Mine and Reclamation (R645-301)	Consider issuance of operational mining actions.
Division of Water Rights	Permit for Stream Alteration	Consider issuance of permit for alteration of natural drainage.
Department of Community & Economic Development		
Utah State Historical Society	National Historic Preservation Act (CFR 800, Section 106)	Consider NRHP eligibility and mitigation of cultural resources.
Carbon County		
	County Zoning Ordinances	Determine compliance with existing land use designation.
Private		
	Confirmation and Review of ROW	Obtain Easements

CHAPTER II. PROPOSED ACTION AND ALTERNATIVES

A. ALTERNATIVES DISCUSSED AND DISMISSED

Two alternatives were discussed and dismissed from further review within this environmental assessment. Alternative A would have established the intersection of the C Canyon Road with State Road 123 in S.L.B.&M. T. 15 S., R. 13 E., Section 7, SE ¼ NE ¼ and continue for 3.56 miles in a north-northeast direction across public, state and private land. The alternative alignment would reconvene with the proposed action in S.L.B.&M. T. 14 S., R. 13 E., Section 28, SW ¼ NW ¼ (PLATE II). The total length of the road with the alternative access would be approximately 6.67 miles. In association with the alternate road alignment, an adjacent alternate power line ROW and telephone line ROW within the road ROW would have been constructed. This alternative would have been within the 0.5 mile zone of protection of two occupied golden eagle nests. Carbon County applied for a federal take permit upon these nest sites. Upon consultation with resource specialists with the BLM, U.S. Fish and Wildlife Service (USFWS), and Utah Division of Wildlife Resources (UDWR), the possibility of significant raptor nesting impacts resulting from this alternative was identified. Since another alternative (Proposed Action) was being analyzed within this environmental assessment that would not intersect the established 0.5 mile buffer zones, it was the opinion of the resource specialists reviewing the alternate route that a take permit would not be granted to allow construction and operation of the road. Since this alignment would be in nonconformance with the raptor use stipulations of the Price River MFP, as well as the federal Migratory Bird Treaty and Eagle Acts, this alternative was dismissed from further review.

Alternative B was to follow the existing alignment of the C Canyon unimproved dirt road from State Road 123 to the proposed mine site. Preliminary engineering of this route indicated that a considerable amount of Mancos shale type material is present along the course of the existing road. Mancos shale is a mixture of silts and clays that tend to expand when exposed to moisture. To compensate for this structural problem, the substrate material would need to be excavated and a road base built thick enough to compensate for the loss in integrity. Since the road base would need to be thicker, it would also need to be wider. To facilitate a wider ROW, a greater impact area would be created. Therefore, due to the considerable cost associated with the construction of a thicker, wider road base, the long term operational maintenance costs associated with the continual expansion of the road substrate, and the increase in project disturbance to the surrounding environment this alternative was dismissed from further review.

B. PROPOSED ACTION - DEVELOPMENT OF THE C CANYON ROAD, 69 kV POWER LINE, WATER LINE, AND UTILITY CORRIDOR IN CONJUNCTION WITH THE DEVELOPMENT AND SURFACE OPERATION OF THE WEST RIDGE MINE

The proposed action would be located in Carbon County, approximately five miles north-northwest of East Carbon, Utah (See PLATE I and II). The proposed road development by Carbon County would intersect State Road 123 in S.L.B. & M., T. 15 S., R. 12 E., Section 12, SW ¼ NE ¼. The proposed road would proceed northeast 7.68 miles, terminating at the proposed WEST RIDGE coal mine facility in C Canyon at T. 14 S., R. 13 E., Section 15, NE ¼ NE ¼; Section 10, SE 14/ SE ¼; Section 11, SW ¼ SW ¼; and Section 14, NW ¼ NW ¼. A separate WEST RIDGE ROW for a 69 kV (69,000 volt) power line would be located adjacent to the proposed road alignment. This power line would tap the existing 69 kV power line near the intersection of the proposed road with State Road 123. A WEST RIDGE ROW for a telephone line/utility corridor would be established within the proposed road ROW. The phone line would be located adjacent to the paved surface, and would follow the road to the proposed mine site. A joint ROW application by East Carbon City and WEST RIDGE for a water line to serve the culinary needs of the mine would be located adjacent to the paved surface of the proposed road. This line would run from East Carbon City to the proposed mine surface facility. FIGURE II-1 is a typical ROW corridor cross section showing the location of each ROW to one another.

DESCRIPTION OF PROPOSED ACTION PHYSICAL FACILITIES AND CONSTRUCTION PROCEDURES

The proposed action to be taken by Carbon County, WEST RIDGE Resources, Inc., and East Carbon City on public, State of Utah and private land includes:

- Development of the C Canyon Road.
- Establishment of borrow and staging areas for equipment storage and associated road fill needs.
- Establishment of an underground telephone line.
- Development of the 69 kV power line to the proposed mine surface facility.
- Development of an underground water line to serve the culinary requirements of the proposed mine surface facility.
- Development of the West Ridge Mine surface facility.
- Potential mitigation areas associated with the proposed action.

The planned surface routes of the road, power line, water line and phone line, as well as area of the proposed mine are shown on PLATE II. Associated areas, such as staging areas, borrow sites, pull sites, pumping stations and all associated access roads are shown on PLATE II as well. Specific details of the road alignment are shown on PLATES II-A through II-N. Surface facilities associated with mine are shown on PLATE II-V. The following section describes each of the attributes of the proposed action.

Road Development - The proposed two lane, 28 foot paved Class B road, totaling 7.68 miles, would transect public, state and private land. The proposed road, designed for a maximum speed of 50 miles per hour, would be constructed according to the standards of the American Association of State Highway and Transportation Officials (AASHTO) and the Utah Department of Transportation 1992 Standard Specifications for Road and Bridge Construction.

Total ROW acreage upon public, state, and private land is shown in TABLE II-1.

TABLE II-1

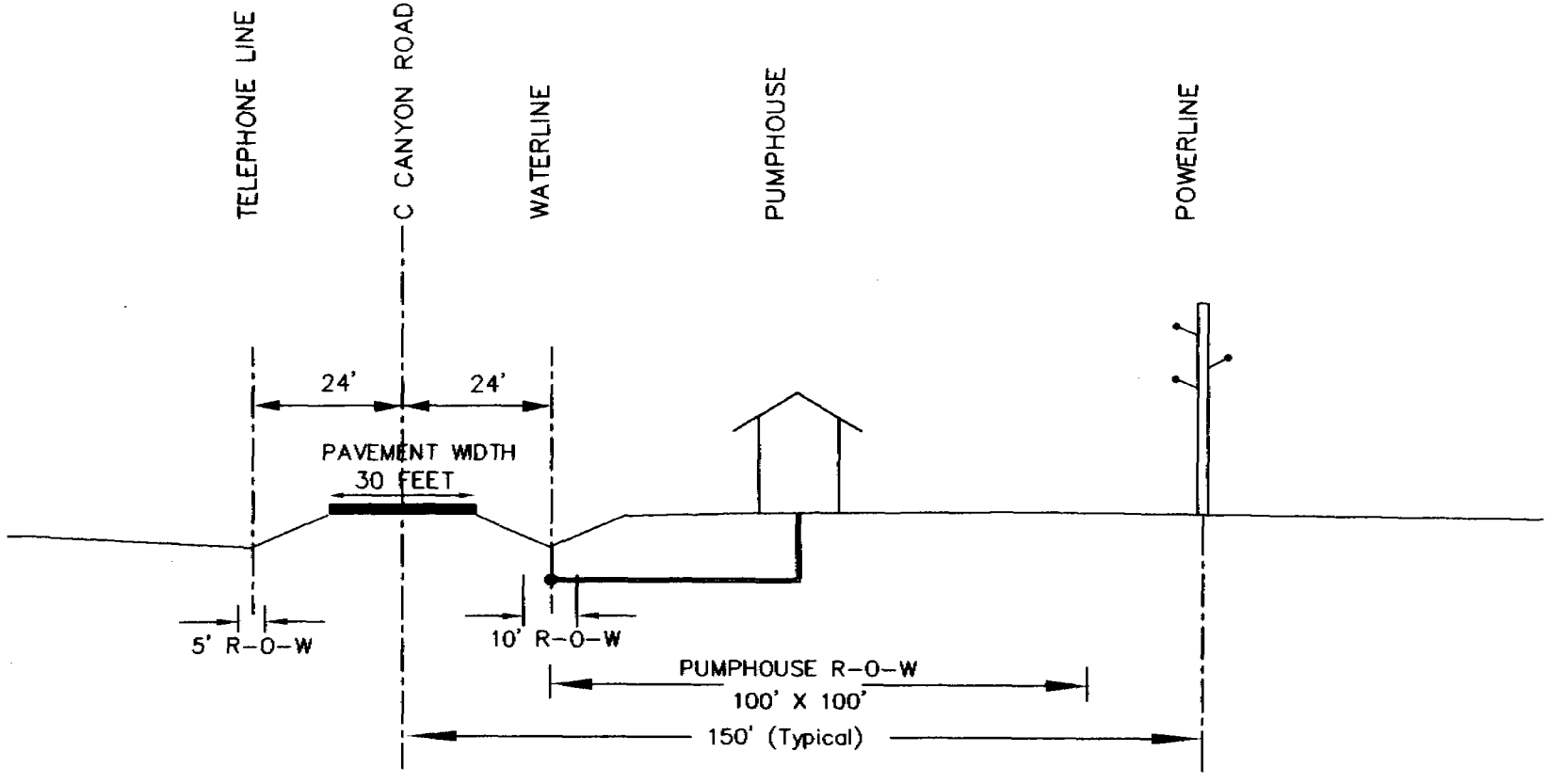
OWNERSHIP SUMMARY OF LAND AFFECTED BY PROPOSED ROAD

Ownership	Miles	Acres - 200' ROW (Construction)	Acres 100' ROW (Operational)
BLM	5.60	135.76	67.88
State of Utah	0.47	11.50	5.75
Private	1.61	39.03	19.52
TOTAL	7.68 Miles	186.29 Acres	93.15 Acres

FIGURE II-2 shows the typical design of the paved road. The area to be disturbed as a result of the construction would vary in width from 50 feet to approximately 200 feet depending on the natural terrain. The desired construction ROW would be 200 feet (186.29 acres) to allow the construction of cut and fill slopes. Upon completion of the road, the temporary construction ROW would be stabilized and reclaimed to BLM and/or land owner standards, thus minimizing the permanent operational ROW to a width of 100 feet (93.15 acres), or 50 feet on each side of the center line of the paved surface.

Approximately 195,000 cubic yards of roadway excavation, 49,988 tons of non-rutting asphalt concrete and asphalt mix, 50,750 tons of untreated base course, and 60,175 cubic yards of granular borrow are proposed. Alignments for the proposed road, as well as the anticipated cut and fill areas, are shown on PLATES II-A through II-N.

TYPICAL RIGHT-OF-WAY CONFIGURATION



NOT TO SCALE

25' CONSTRUCTION R-O-W REQUIRED IN AREAS WHERE WATERLINE IS NOT INSTALLED WITHIN ROAD R-O-W

FIGURE II-1

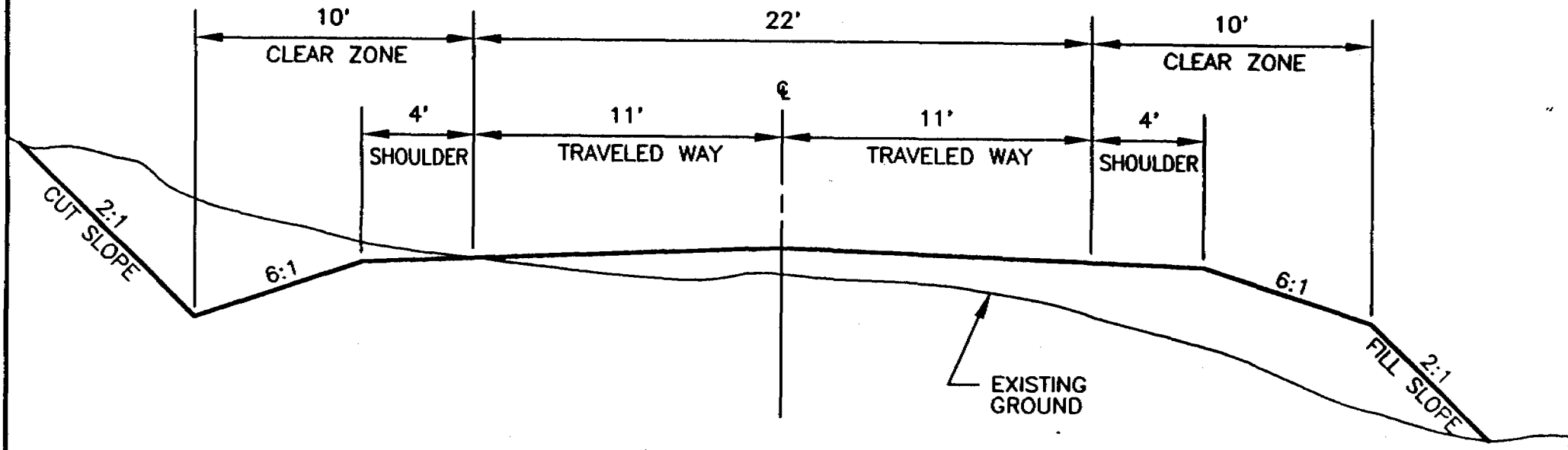
The time frame for completion of the proposed road is 120 days, beginning Summer, 1998 and ending Fall, 1998. The contractor would have a crew of approximately 20 to 30 people, and would utilize the following equipment during the various phases of construction:

Road Grader
Rubber Tired Loader
Conventional Scrapers
Hydraulic Excavators, Track Mounted and Wheel Mounted
Rear Dump Trucks
Belly Dump Trailers
Asphalt Paving Machines
Water Truck for dust control
Steel Drum Static Compactors
Sheeps Foot Compactors
Hand Held Vibratory Plate Compactors
Gravel Crushing Facility
Track Dozers
Construction Office Trailer

Due to the condition of the proposed road and associated access roads (narrow width, blind curves and rough surface) during construction, as well as the amount of construction activity that would take place, unauthorized personnel would not be allowed within the area during construction activity. Warning signs and flag crews would be utilized for traffic control at the intersection of the proposed road with State Road 123 during construction.

Crews would begin by clearing and disposing of all trees, vegetation, and debris within the staked limits of the roadway, channels, and other designated areas. The contractor would not disturb areas outside the slope staked limits unless prior written approval is received from the BLM. Upon completing the clearing of the ROW, crews would begin the construction of the roadway subgrade. Graders, scrappers and dozers would be utilized to obtain the necessary grade and alignment shown on PLATES II-A through II-N.

To facilitate the development of the C Canyon Road, a stream crossing is planned for Grassy Trail Creek. A double barrel concrete box culvert would be installed where the proposed road would cross Grassy Trails Creek in T. 15 S., R. 12 E., Section 1, NW ¼ SE ¼. Correspondence with the Utah Regional Engineer and Division of Water Rights, as well as engineering designs for the stream crossing are included as APPENDIX A. Where structures and realignments are to be built, the contractor would excavate and establish the elevations and dimensions necessary to construct the particular structure. Silt fences, or other sediment control structures would be utilized to prevent sediment loading during bank manipulation. Coffer dams would be constructed to allow work to take place in areas inundated with water and removed when no longer needed. The contractor would tie the steel for the concrete structures and construct the forms prior to pouring the concrete. After the concrete has set up, the forms would be dismantled and the structure backfilled to bring the roadway surface to grade.



WEST RIDGE ROAD

Typical Section

CREAMER & NOBLE
ENGINEERS
ST. GEORGE, UTAH

EXHIBIT NO.: 2 FIGURE 2

After the road subgrade is completed, the contractor would begin hauling, placing and compacting of granular borrow to a depth of 12 inches. This is the first phase of the surfacing. The second phase of surfacing would entail placing and compacting of a six inch lift of untreated base course. Within C Canyon, the ephemeral channel would be realigned in two locations to facilitate the proposed road in an area located outside of the drainage area, as well as to minimize disturbance to the canyon environment. These locations, in T. 14 S., R. 13 E., Section 15, SE ¼ NE ¼, would involve 100 feet and 250 feet of channel respectively, with curves being placed in the channel to minimize flow velocity and rip rap on the banks to prevent scouring. The permit application, correspondence with the Utah Regional Engineer, and designs associated with the realignment are included in APPENDIX A.

After the untreated base course is completed, the contractor would spray a prime coat of liquid or emulsified asphalt over the base course. The prime coat would remain on the surface for a period of 24 to 48 hours, after which time the contractor would begin the placing and compaction of the asphalt concrete. After the asphalt concrete has had time to set properly, the contractor would paint the traffic lane lines. Other traffic control items such as signing, would take place throughout the entire construction phase of the operation. The entire length of the road would be fenced and cattle guards and/or gates would be installed upon completion of the road and establishment of the operational ROW. The location of these facilities is shown on PLATE II.

In association with the construction areas that would be reclaimed upon completion of the proposed project, an effort would be made to reclaim existing roads and four wheel drive trails on public lands that intersect the proposed road. This would be completed to minimize any cumulative impacts to area wildlife that the proposed road may create. Where existing road sections are eliminated, cuts would be pulled back to the approximate original contour and drainages would be reestablished. Concurrent with recontouring, revegetation using an approved BLM seed mix would be completed. A seed mix designed for slope stabilization and wildlife enhancement would be utilized.

Road Borrow and Staging Areas - Two sites would be located on Utah School and Institutional Trust Lands (USITLA). A 23 acre site would be located in T. 14 S., R. 13 E., Section 16, NE ¼ SE ¼, and a 45.3 acre site would be located in Section 32, NW ¼ NW ¼. These areas would be utilized for fill requirements associated with the proposed road construction. An existing dirt road would be utilized to access the borrow area in Section 16. A short 0.10 mile dirt access road on state land would be created from the end of the existing road on public land to access the immediate area of the Section 32 borrow site. This road would intersect the proposed paved road in the NW ¼ SE ¼ of Section 31.

Topsoil would be stripped prior to excavation of the site to a depth of four inches. This soil would be stored within an erosion control berm constructed around the site. The berm would control drainage from the borrow/storage site and reduce impacts to the surrounding undisturbed area. Upon completion of the project, the area and associated facilities would be covered and recontoured with the stored topsoil and revegetated. PLATE II includes the location of these borrow sites and access roads. Correspondence and permit applications associated with the Utah School and Institutional Trust Lands Administration are included in APPENDIX B.

Two separate one acre areas would serve as equipment staging and material storage sites during construction of the proposed road. A site on private land near the intersection of State Road 123 in T. 15 S., R. 12 E., Section 1, NE ¼ SW ¼, and a site on public land at T. 14 S., R. 13 E., Section 15, SW ¼ SW ¼ near the Section 16 borrow site below C Canyon would be utilized. Fuel and oil may at times be stored within this area during construction of the road. A Spill Prevention Control and Countermeasure Plan (SPCC) is included as APPENDIX C. Upon completion of construction activities associated with the proposed action, this area would be recontoured and revegetated.

Underground Telephone Line - WEST RIDGE would install, upon completion of road construction, a telephone line within the corridor to serve the proposed mine. The line would be buried at a depth of 24 to 36 inches, approximately three feet from the edge of the asphalt surface. A junction box would be installed approximately 3000 feet from the intersection with State Road 123. At approximately 6,000 foot intervals along the length of the road, similar boxes would be installed. The four by five inch boxes, colored gray/green, would stand approximately 36 inches above the surface. A 10 foot wide corridor on the cut, or uphill, side of the road, would be located within the permanent ROW of the proposed road. The utility corridor would be located entirely within the disturbance associated with the new road and would accommodate any future gas, and/or sewer lines during the life of the mine.

69 kV Power Line Development - A 6.86 mile 69 kV (69,000 volt) power line located on public, state and private land, would be constructed upon the completion of the proposed road. The proposed power line would tap the existing Utah Power 69 kV Helper-Columbia #1 power line near the intersection of the proposed road with State Road 123. Construction within a 100 foot wide ROW adjacent to the proposed road ROW would be conducted by ground crews using tracked and/or rubber tire vehicles. Specific steps to complete the power line includes pole placement, crossarm assembly, line suspension and tension, installation of a switching station at the tap point, and metering station and substation within the area of the proposed mine surface facility. Upon completion of the line, the operational ROW would be minimized to 80 feet. The proposed route of the power line and associated facilities are shown on PLATE II. Total power line ROW acreage upon public and state land is shown in TABLE II-2.

TABLE II-2

OWNERSHIP SUMMARY OF LAND AFFECTED BY PROPOSED POWER LINE

Ownership	Miles	Acres - 100' ROW (Construction)	Acres - 80' ROW (Operation)
BLM	5.78	70.00	56.00
State of Utah	0.45	5.48	4.38
Private	0.83	10.04	8.03
TOTAL	7.06 Miles	85.52 Acres	68.41 Acres

The power line would require the establishment of approximately 95 pole sites. Pole types would be

single "C2T" and "HPS" structures, double "ES" structures, and triple "C3P" structures (FIGURE II-3, II-4, II-5, and II-6). Structures would be constructed using wood poles, with heights ranging from 60 to 80 feet. All features of the line hardware (insulators, wire, poles) would be non-reflective and designed to be raptor-safe, as described by the Raptor Research Foundation in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996.

No access roads would be created during the construction, operation or maintenance of the proposed power line. Access for all phases of the power line would be gained by the existing roads within the area. Where accessible, rubber tired construction/maintenance vehicles would travel perpendicular from the road or trail to each pole location. Helicopter placement of poles could be implemented in areas of restricted access. The specific area identified for potential helicopter access would be upon public land along the steep, rocky slope below the proposed mine surface facility in S.L.B.& M., T. 14 S., R. 13 E., Section 15.

The proposed power line has been designed to minimize the number of employees necessary to maintain its length. Maintenance of the line and associated operational facilities would be on an as-needed/emergency basis. Maintenance access would be along established roads by 4x4 vehicle or snow machine and within the 80 foot operational ROW. Inaccessible areas would be maintained by foot and/or helicopter. The proposed power line would be compatible with the other ROW's. Throughout most of its length, the power line would be adjacent to the proposed ROW for the C Canyon Road. However, no interference with this line or any other line within the area would be anticipated.

The staging areas identified for the proposed road (PLATE II) would be utilized for equipment and material storage and assembly, due to their location to State Road 123 and their proximity to the proposed facilities and power line ROW's. During construction, these areas may be used as a helipad for helicopter access. The construction vehicles to be used would include two line trucks, two bucket trucks, a wire trailer, a pole trailer, and a crew truck. A crew consisting of 12 individuals and a line truck with an auger attachment would be used to dig the holes within accessible areas along the ROW. Holes would be excavated to a depth of eight to 10 feet and 14 feet where anchor structures are required. In areas of limited access or areas of critical concern, the 20 foot boom on the line trucks could be used to auger holes. All holes would be located as to create as little disturbance as possible. Pole location can be moved up to 24 inches within the ROW if topography and/or an identifiable impact to cultural, vegetation or wildlife resources are present at the site of the structure.

Poles would be transported to the site by truck, where the structure components (cross pieces and insulators) would be assembled on the ground and erected by a truck-mounted crane. A helicopter could be used to set and string preassembled structural components in areas of limited access. In areas of thick vegetation and/or where vegetation may impede the performance of the active line, vegetation would be cleared by hand-held chainsaws. This cut vegetation would be stockpiled and used later to scatter over any reclaimed areas to provide solar protection on newly revegetated sites.

When the structures are in place, the conductor would be strung. A sock line would be laid along the route by hand and light vehicle, and/or by helicopter. Ground crews would place the sock line in pulleys on each structure at the insulator location. The conductor would then be pulled up by the

pulleys and through the insulator with the assistance of a reel truck, or by hand, before moving to the next pole location. Wire stringing lengths for this project would be limited to 2.5 miles between pull sites due to the numerous angles, terrain, and inability of the wire pulling equipment to pull the conductor into place. Several locations along the proposed power line route would be utilized as pull sites during stringing activities. These pull sites, approximately 0.25 acres in size, would be situated within the power line ROW.

In areas where topography and access inhibits conventional power line construction, helicopters could be used to set the structure and string the conductor. This would help to ensure the environmental quality of the area surrounding the proposed power line without excessive disturbance of resources due to construction of access roads and the removal of vegetation along the ROW. Helicopter use would occur after any raptor nest use periods.

A switching station may be installed where the proposed power line would tap the existing power line. Location of the switching station would be located on a 200 foot by 200 foot area adjacent to the proposed road and existing power line on private land.

Water Line - Upon completion of the proposed road, an 8.28 mile water line, crossing public, state and private land would be constructed by East Carbon and WEST RIDGE to serve the culinary water needs of the proposed mine surface facility. The line would utilize six and eight-inch ductile iron pipe and, though designed to carry up to 150 gallons of water per minute (gpm), would provide for an average of 75 gpm to the proposed mine surface facility. Approximately 0.7 miles of the proposed line would be an eight-inch line constructed by East Carbon City. East Carbon City would tap the existing line at Mile Post 7.5, and construct the line within the ROW of State Road 123. Upon construction of 0.7 miles of the eight-inch line, the proposed line would cross under State Road 123 where the proposed line would be reduced to a six-inch line. From this point, the line would be constructed by WEST RIDGE and located adjacent to the existing state road ROW. The line would follow State Road 123 on private land for approximately one mile, before diverging to the north across private and public land to meet the ROW of the proposed road in T. 14 S., R. 13 E., Section 28, SW ¼ NW ¼.

On lands where the proposed line would create new disturbance, a 25 foot construction ROW would be utilized and minimized to a 10 foot operational ROW. A 10 foot construction and operational ROW would be utilized where the line would be located within the proposed ROW of the road. The line would be placed at a minimum of five feet from the paved surface of the road. TABLE II-3 is an overview of the ownership and acreage of lands associated with the proposed water line.

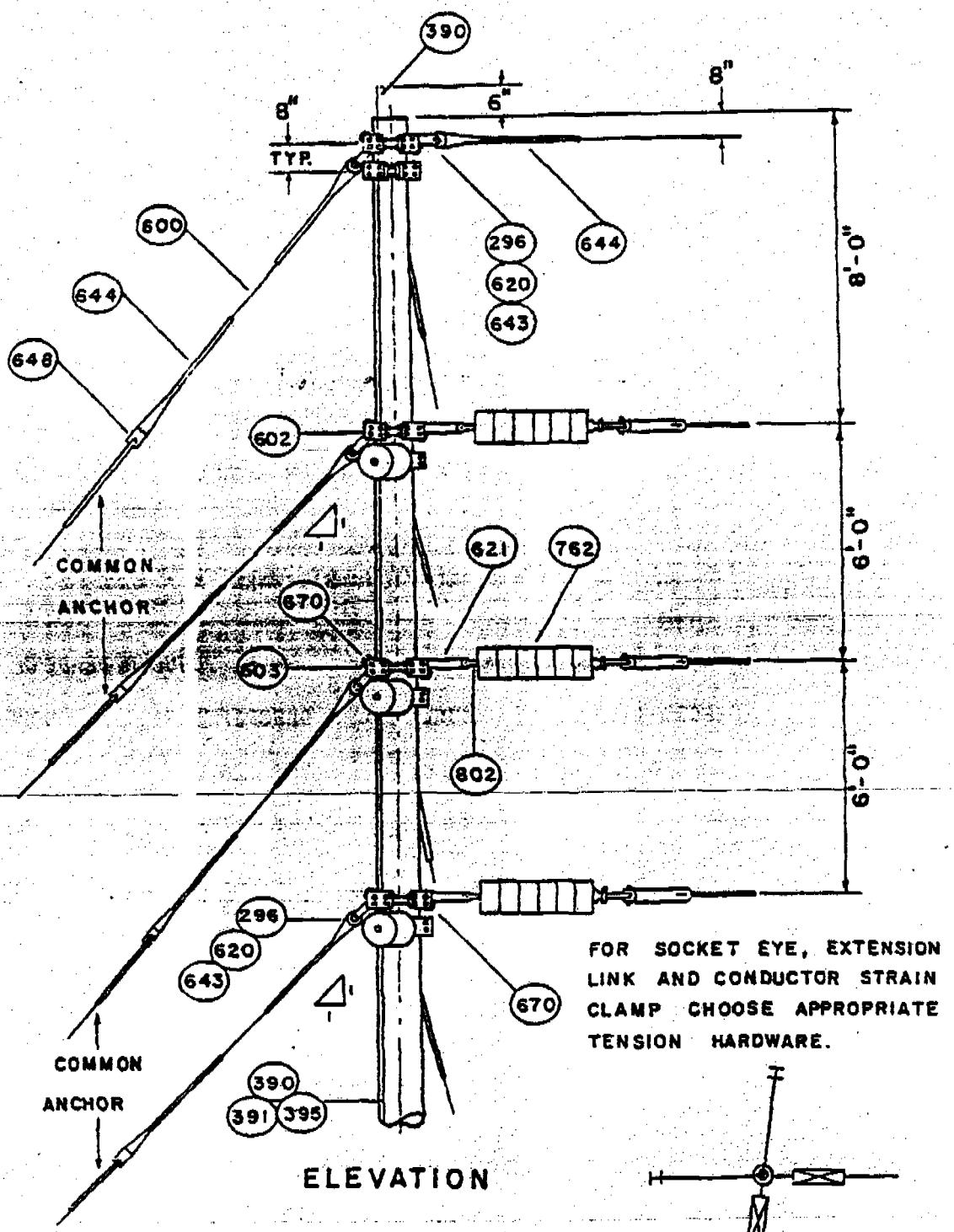
TRANSMISSION
23 JUNE 1978

UTAH POWER & LIGHT CO.

C2T 46 AND 69 KV STRUCTURE

(6 INSULATORS PER STRING)

MODULE 304611



ELEVATION

PLAN

NOTE:

POLE GROUND WIRE TO BE CLIPPED TO POLE AT 2'-0" INTERVALS AND BONDED TO ALL POLE BANDS.

4-29-83 REVISIONS - GENERAL

SUPVR. TRANS. LINES ENG

APPROVED

DRAWN BY

CHECKED BY

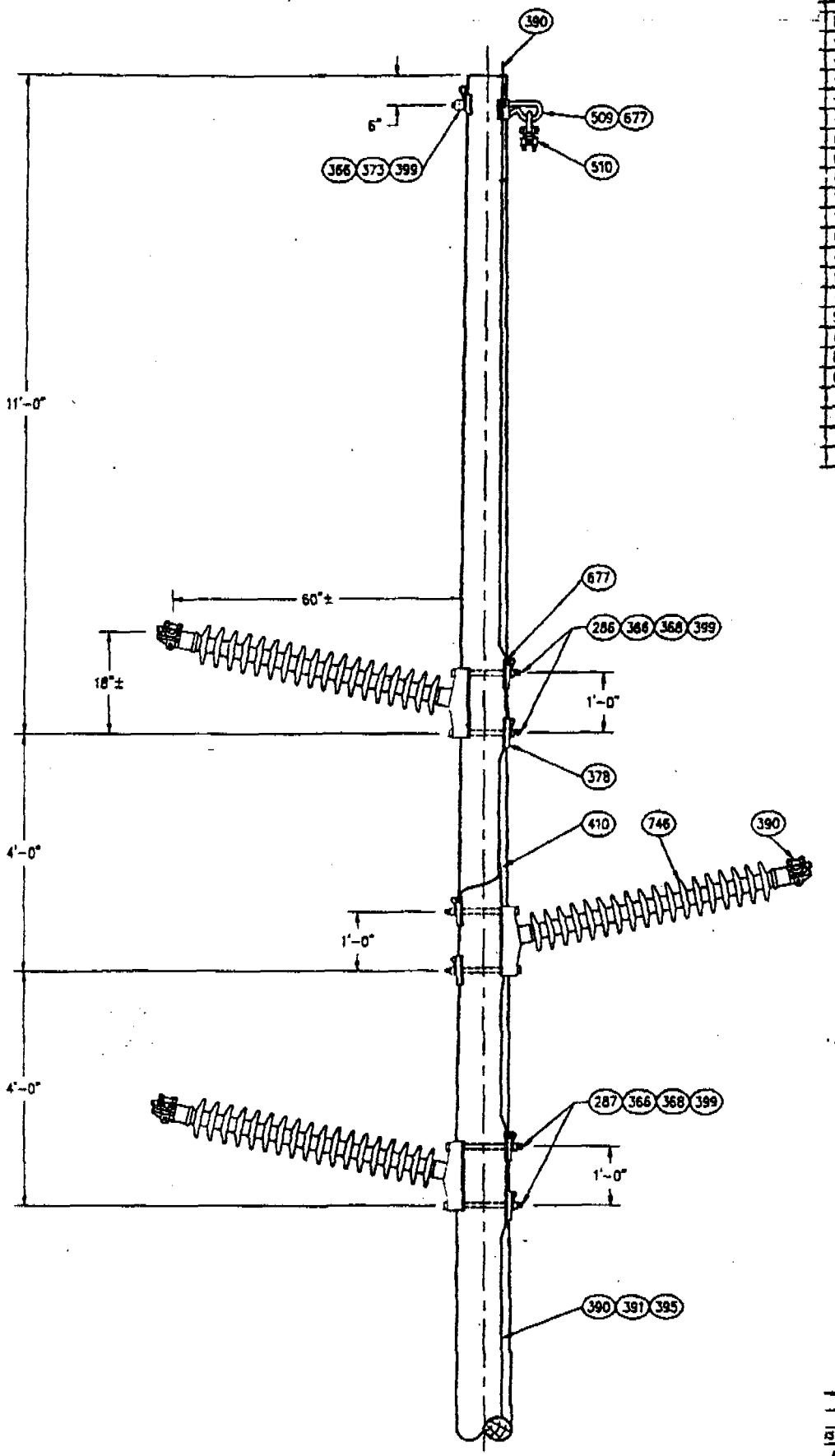
CORRECT

FIGURE II-3

BILL OF MATERIALS

DESCRIPTION	STOC
POLE	
⅝" X 16" MACHINE BOLTS	62
⅝" X 18" MACHINE BOLTS	62
⅝" SPRING WASHERS	
⅝" GALVANIZED NUTS	
4" SQUARE CURVED WASHER	62
6" SQUARE CURVED WASHERS	15
GROUNDWIRE	45
GROUNDWIRE CLIPS	61
1½" STAPLES	50
10d GALVANIZED NAILS	50
COPPER BUTT PLATE	15
⅝" LOCKNUTS	62
CABELOK CRIMPITS	46
⅝" X 12" SHIELDWIRE BOLT	15
SUSPENSION CLAMP (SW) (IRON 0.2" TO 0.46")	64
GROUNDING CLIPS	15
HORIZONTAL POST INSULATORS	58
CLAMP TOP CLAMPS	AS S

1463



May be used in raptor areas

"HPS" RAPTOR SAFE
46/69 KV STRUCTURE
(POLYMER INSULATORS)

PACIFICORP TRANSMISSION ENGI

SCALE: NONE | SHEET 1 OF 1 | 00C4IT

FIGURE II-4

TRANSMISSION

UTAH POWER & LIGHT CO.

23 JUNE 1978

ES 46 KV STRUCTURE*

(3 INSULATORS PER STRING)

1 SHIELD WIRE

CASE 1 MODULE 304615

CASE 2 MODULE 304616
X-BRACE

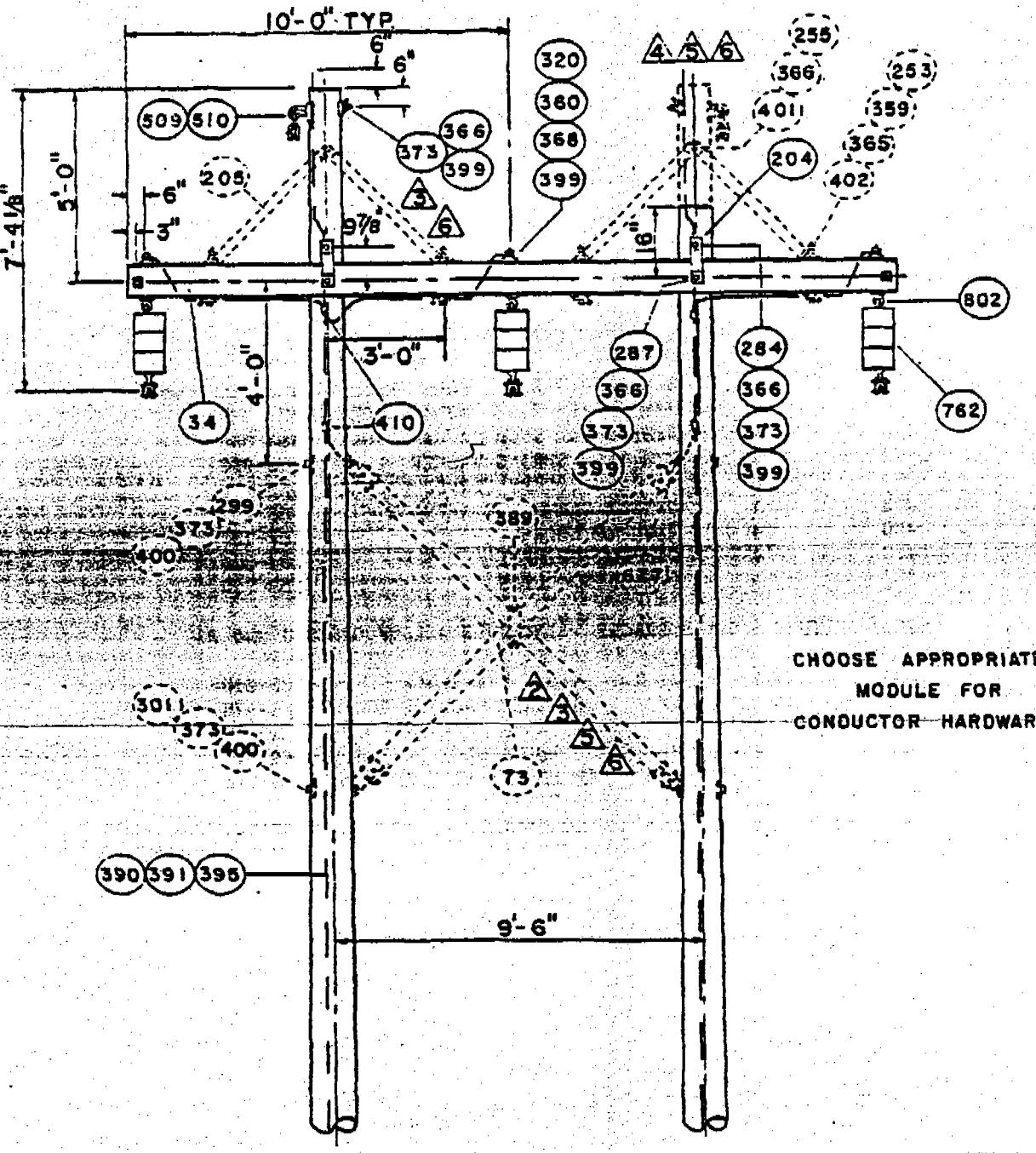
CASE 3 MODULE 304617
X-BRACE & V-BRACES

2 SHIELD WIRES

CASE 4 MODULE 304618

CASE 5 MODULE 304619
X-BRACE

CASE 6 MODULE 304620
X-BRACE & V-BRACES



*FOR 69 KV STRUCTURE SEE NEXT PAGE.

NOTE: POLE GROUND WIRE TO BE CLIPPED TO POLE AT 2'-0" INTERVALS AND BONDED TO SHIELD WIRE BRACKET AND ALL THRU BOLTS. GROUND ALL CROSSARM HARDWARE USING EXTRA NUT AS SHOWN.

5-4-83 REVISIONS - GENERAL

SUVA TRANS LINES ENG

APPROVED

DRAWN BY

CHECKED BY

CORRECT

FIGURE II-5

TRANSMISSION
17 MAR.1980

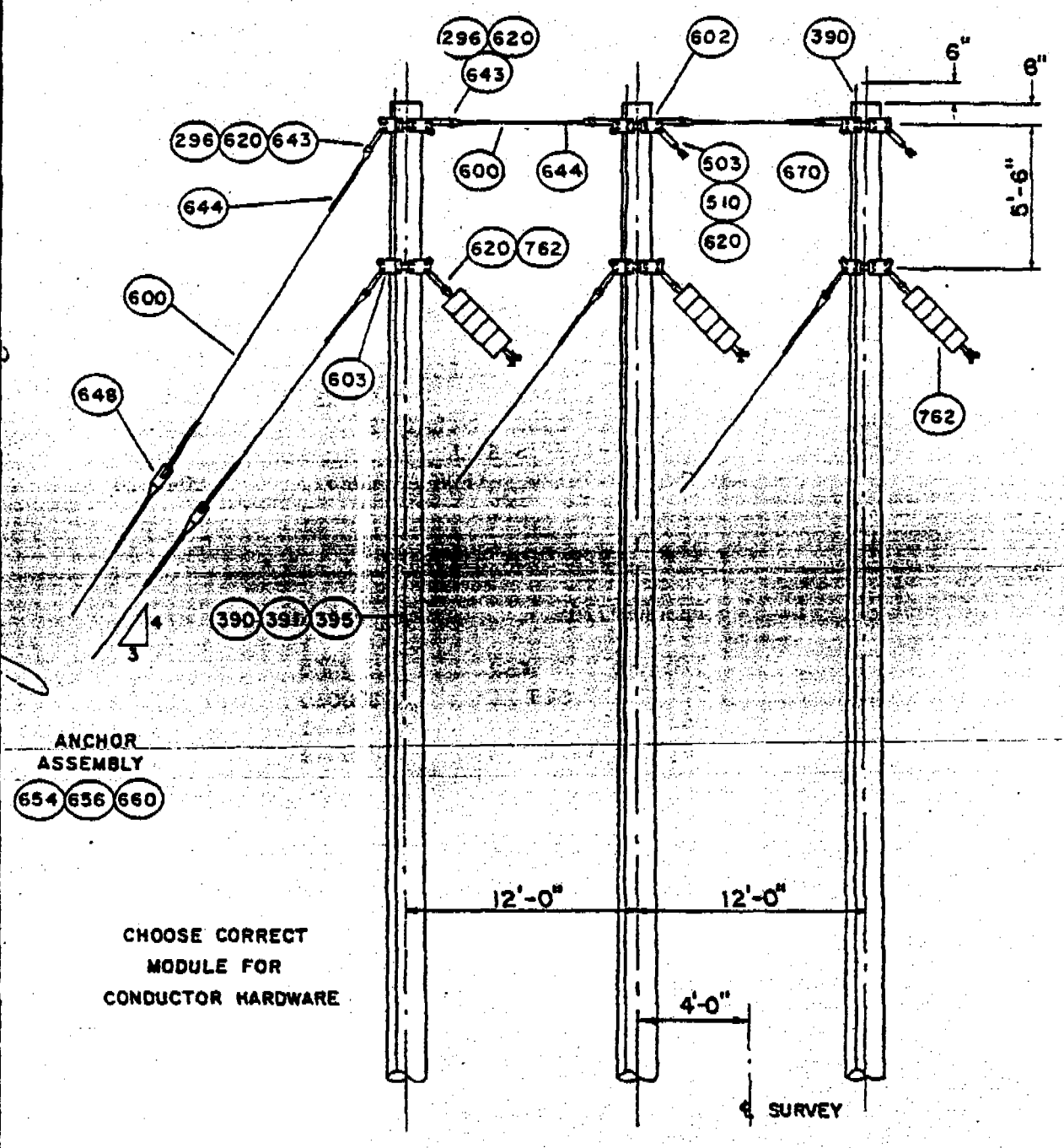
UTAH POWER & LIGHT COMPANY

C3P

46 & 69 K.V. STRUCTURE

MODULE 304624

(5 INSULATORS PER STRING)



NOTE: GROUND WIRE TO BE CLIPPED TO POLE AT 2'-0" INTERVALS AND BONDED TO POLE BANDS.

APPROVED: SUPVR. TRANS. LINES ENG.

5-3-83 REVISIONS - GENERAL

DRAWN BY
CHECKED BY
CORRECT

FIGURE II-6

TABLE II-3

OWNERSHIP SUMMARY OF LAND AFFECTED BY PROPOSED WATER LINE

Ownership	Miles	Acres - 25/10' ROW (Construction)	Acres - 10' ROW (Operational)
BLM	4.83	7.34	5.85
State of Utah	1.10	1.98	1.33
UDOT	0.79	0.96	0.96
Private	1.56	4.73	1.89
TOTAL	8.28 Miles	15.01 Acres	10.03 Acres*

- No Surface Operational Surface Disturbance Anticipated

Construction crews would utilize a track hoe, back hoe, or other trenching equipment to excavate a two foot wide, four foot deep trench. Where new disturbance would occur, topsoil would be stripped to a depth of six inches and sidecast into a berm paralleling the trench for use during reclamation. Subsoil material removed from the trench would be stored separately from the topsoil. Crews would work in tandem during trenching and line assembly. Upon completion of assembly and placement of the line in the trench, crews would cover the line with the excavated subsoil and replace the stored topsoil. The area would then be revegetated with the appropriate seed mix and vegetation plan approved by the BLM and private landowner. No surface access roads would be left in place within the 10 foot operational ROW.

In order to lift the required volume of water to the mine, two 40 horsepower electric pump stations would be located adjacent to the water line and road. Two, 100 foot by 100 foot areas between the operational ROW's of the road and power line would be located in NW ¼ SW ¼ of Section 29 and the SW ¼ SW ¼ of Section 15. Sizing of these pads would allow for the siting of the pump house adjacent to the power line without the creation of an additional ROW for access. Construction crews would clear the immediate location of the 16 foot by 13 foot pump house using crawler tractors or graders. A 100 foot dirt access road within a 10 foot ROW would then be graded laterally from the proposed C Canyon road to each pump house. The pump houses would be constructed of cast-in-place concrete to minimize vandalism and painted with an approved BLM color to minimize visual impact. The pump houses would be heated and cooled to maintain the efficient operation of the pumps throughout the year. An above ground power line, approximately 100 feet in length, would tap the adjacent proposed power line at each pump house location. Pole mounted substations would be constructed within the pump house areas to convert the three phase power of the 69 kV line to single phase for use by the pumps.

Development of the West Ridge Mine - Upon completion of the proposed road, construction would commence on the surface facilities associated with the development of the West Ridge Mine within the lease modification area. The proposed surface disturbance area is shown on PLATE II-O. This plate depicts the maximum potential disturbance around the facilities that would be used for the life of the mine. The proposed maximum disturbance area amounts to approximately 29 acre and would

be composed of the anticipated on-the-ground disturbance (projected at about 25 acres) plus extra undisturbed buffer acreage around the perimeter of the facility. The proposed disturbed area would be the total disturbance needed for the life of the mine and would be reclaimed following the completion of underground mining activities.

Surface structures and facilities for the West Ridge Mine, an underground mine, would be constructed in C Canyon near the fork in the canyon within a proposed 80 acre lease modification area located at T. 14 S., R. 13 E., Section 10, SE ¼ SE ¼ and Section 15, NE ¼ NE ¼ (PLATE II and PLATE II-O). As described, the actual surface disturbance associated with the mine development would not exceed 29 acres. Therefore, approximately 55 acres of the lease modification area would remain undisturbed for the life of the mine. The function of the surface facility area would be to provide for mine access, mine ventilation, coal storage, coal loading, warehousing, offices, and the bathhouse.

WEST RIDGE is currently within the permit review process of a Mine and Reclamation Permit Application (MRP) for their Utah Division of Oil, Gas and Mining (UDOGM). This permit application with the UDOGM requires that all proposed mine and mining activities be described in full detail in relation to legal issues and bonding, as well as engineering and how it relates to soils, biology, land use, geology, and hydrology. In association with the proposed WEST RIDGE engineering actions, mitigation as recommended by the UDOGM in the form of operational stipulations and creation of successful reclamation procedures upon the cessation of mine operations have been incorporated into each resource discussion within the MRP. Therefore, each action as proposed within this EA has taken into consideration the various resources present and UDOGM requirements to minimize impacts to them. Actions as described within this EA have been summarized from the detailed WEST RIDGE MRP analysis.

The mine site surface facilities would be located in C Canyon where the Lower Sunnyside coal seam outcrops to the surface. Because of the narrowness of the canyon in this area, surface facilities would be confined to a narrow strip along the bottom of the canyon. Suitable surface area for the mine site would be created by constructing a series of earthen pads within the canyon bottom. This would be accomplished by hauling in fill material and by leveling out the area in the bottom of the canyon drainage. The average gradient of C Canyon in the mine site area is approximately 6.4 percent. Therefore, the mine pads would be constructed up through the canyon in a stair step manner. Each individual pad level would be dedicated to a specific function as part of the overall mine site operation. Access roads would connect the various pad levels with one another.

The proposed mine site is located in an area where the main canyon branches into two forks. For simplicity, the mine site can be delineated into four distinct areas: the area located within the left fork (left fork); the area located within the right fork (right fork); the area located within the main canyon south of the forks (main canyon); and the area where the main canyon and the two forks converge (confluence). These terms (right fork, left fork, main canyon and confluence) will be used during the remainder of this discussion to refer generally to these respective areas. The mine office, parking lot and a series of sediment ponds would be located within the main canyon. The proposed road which provides access to the mine site would enter the mine yard in this area. The truck loop and truck loadout would be located within the confluence area. The left fork would contain the crusher

building, the coal storage pile and a topsoil storage area. The right fork would contain the employee parking area, bath house, substation, portal area, shop/warehouse material storage area and a topsoil storage area.

As part of the overall mine site development plan, certain major construction tasks must be accomplished in a prescribed manner. Most of these construction tasks are common to many, if not all of the area described above. The following tasks are listed in order in which they would generally be expected to occur within any given area of the mine site. However, in practice many of these construction tasks would be occurring simultaneously, but at different areas, throughout the mine site. This is attributable to the fact that the mine site construction would be done over a long narrow stretch of the canyon bottom. Most construction tasks would begin at the lower, down-canyon end of the mine yard and proceed up canyon. As primary initial tasks are completed at the lower reaches of the site, secondary tasks can begin even though the primary tasks may not yet be completed in the upper reaches of the site. A more detailed construction and reclamation plan, as prepared by WEST RIDGE for their MRP is included as APPENDIX E.

The following discussion assumes that topsoil in certain areas of the C Canyon mine surface facility would be protected in place for the life of the mine. This would be an experimental practice subject to the Office of Surface Mining (OSM) as part of the permitting process. If this experimental practice is not approved, then all topsoil would be salvaged and stockpiled in the conventional manner.

Clearing and Grubbing - One of the earlier phases of construction would involve the removal of all trees and shrubs from the mine site area. Prior to harvesting of large commercially valuable trees, a BLM timber appraisal would be conducted to determine the value of these resources. WEST RIDGE would then reimburse the BLM for the value of these trees. Smaller pinyon and juniper trees would be cleared and transported to an off-site green wood storage area for public fuel harvesting use. Shrubs and all other slash material would be buried in a controlled manner within the pad fill in non-structural areas such as the coal storage pad in the left fork and the material storage area in the right fork. In order to avoid compaction complications, slash would be buried away from the bypass culvert which would be installed in the bottom of the existing drainage.

Installation of the Bypass Culvert - The initial phase of construction would involve installation of the undisturbed drainage culvert (bypass culvert). This culvert would be installed within approximately 1.11 miles of the existing channel and side drainages and designed to carry the natural canyon drainage underneath the mine site. This culvert system allows the natural drainage to "bypass" the disturbed area of the mine site. This separation also would allow the disturbed area drainage to report to sediment control features on the surface, thereby preventing intermingling with the natural undisturbed drainage flowing through the bypass culvert.

Prior to culvert installation the channel bottom would first be prepared. A backhoe would be used to smooth out and grade the channel bottom. Large boulders would be moved aside and irregularities (humps, bumps and depressions within the channel bottom) filled in utilizing native materials. Where needed, a thin layer of bedding material (imported crushed eight inch

borrow) may be laid in the channel bottom to aid in culvert installation. In areas of pronounced grade breaks additional bedding material may be required to provide an adequate vertical alignment for the culvert. In other areas where the existing channel is already smooth and uniform, no bedding material may be required. To the maximum extent possible the alignment of the bypass culvert installation would closely follow the existing stream channel. Culvert angle-joints would be pre-engineered and pre-fabricated to insure that the existing channel alignment can be followed as closely as possible.

Boulders would be removed from the culvert path and relocated up along the flanks of the channel. In this location the boulders would be in convenient proximity to be repositioned back into the stream channel upon final reclamation to replicate the pre-existing pre-mining geomorphology of the channel. Trees and shrubs would be removed from the channel prior to culvert installation. In areas where topsoil resources are located within and along the banks of the existing channel, trees and shrubs would be cut off about six to eight inches above the ground surface. Stumps and roots would be left in place to help stabilize the existing soil and the existing channel configuration.

After the channel has been readied for culvert installation (i.e., graded, bedding material placed, boulders removed and vegetation removed) the culvert would then be installed. The typical pre-culverted channel would be about 10 to12 feet wide across the bottom and would have natural 2:1 sideslopes. Before the culvert is installed in topsoil areas, the channel bottom would first be lined with a geotextile fabric placed across the full width of the channel and extending up the side banks at least five feet on either side of the channel. The purpose of the geotextile would be to provide a separation barrier to protect the channel and the stream bank topsoil, and to preserve it in its natural condition prior to being filled over during subsequent construction of the mine pads. This would help ensure that upon final reclamation the channel morphology could be adequately restored.

After the geotextile has been placed through the prepared channel, the culvert would then be installed on top of it. As explained earlier, the culvert alignment would closely follow the existing channel alignment. However, in a few selected areas the culvert alignment would be shifted slightly to accommodate important surface structures, such as the mine fan and the substation. After the culvert has been laid in place, it would immediately be back filled using the same imported eight-inch fill material that was used for the bedding. Vertical risers would be installed at various locations along the length of the culvert to aid in hydraulic venting and to serve as access for inspection and maintenance. After the culvert has been backfilled and compacted, the area over the top of the culvert could be used as an access way for machinery and material involved in the remainder of the site construction.

Construction of the Sediment Ponds - Once the culvert installation has progressed beyond the location of the sediment ponds, construction of the initial sediment ponds would commence. The sediment pond actually consists of three individual smaller ponds or cells. Each of these cells would be constructed in the bottom of the canyon directly over top of the bypass culvert. The lower pond (Cell C) would be constructed first, after the bypass culvert has been installed through that area. As construction of the culvert continues upstream the

remaining two pond cells would be installed in sequence. In this manner the sediment ponds would be installed as early as possible in the construction schedule. These ponds would then be in place for the entirety of the remaining construction activities and would provide maximum sediment control for the rest of the project.

The three-tiered multi-cell pond arrangement would be well suited to the steep gradient and narrow confines of the canyon. The ponds would be constructed in a cascading arrangement whereby most mine site disturbed area drainage would report initially to the uppermost pond. If the upper pond fills to capacity, excess runoff would report to the middle pond through an open channel spillway located between the ponds. If the second pond fills to capacity, the excess run-off would then report to the third and lowermost pond. The combined capacity of the three-celled pond would be well in excess of the 10 year, 24 hour precipitation event requirements. However, if the total pond capacity was exceeded, the over flow from the third pond would exit through a riser-type culvert primary spillway equipped with an oil skimmer. This riser spillway would lead directly to the main bypass culvert located below the sediment ponds. One advantage of the multi celled pond is that most sediment would tend to collect in the upper pond. This would greatly simplify sediment monitoring and clean out. The three-cell arrangement would also preclude the possibility of short-circuiting and simplify the process of decanting the pond in a manner that meets Utah Nonpoint Discharge Effluent Source (UNPDES) requirements.

All open channel spillways would be constructed to pass the 10 year, 24 hour storm event. Spillways would be lined with concrete or grouted rip rap, and have a bottom width of five feet; a freeboard depth of two feet; and 2:1 sideslopes. The lower pond would also be equipped with an open channel emergency spillway capable of handling a 25 year, 6 hour storm event. Rip rap would be installed at the outlet of all open channel spillways to protect the earthen structures from erosional forces.

Topsoil Removal, Salvage and Stockpiling - Within the mine site there are sideslope areas where topsoil presently exists. In these areas the topsoil resource would be carefully removed and stockpiled before any additional excavation continues. All topsoil salvaging would be completed under the direction of a soil scientist. Based on the soil surveys completed in this area, up to 24 inches of topsoil may exist in these areas which could be salvaged. Topsoil in these areas would be salvaged with backhoes, trackhoes and/or small front end loaders and hauled by dump trucks to the designated topsoil storage areas. If the topsoil depth in these areas averages 18 inches, as much as 6,506 cubic yards of topsoil could be available to be salvaged and stockpiled. All topsoil areas would be bermed and revegetated to ensure their stability.

Two topsoil storage areas are being proposed: one at the upper end of the material storage area in the right fork, the other at the upper end of the coal storage pad in the left fork. The right fork area would be the primary storage area. The left fork storage area would be utilized if needed in the event that the right fork area was filled to capacity and additional storage area was required. The left fork storage area may also be utilized if separate and segregated stockpiles are needed to maintain the integrity and identity of the individual soil

types present at the site for future reclamation.

An alternative 20 acre topsoil borrow area adjacent to the proposed road borrow area in T. 14 S., R. 13 E., Section 16, NE ¼ SE ¼ may be used to meet the reclamation standards of the proposed mine surface facility (PLATE II). This area would remain undisturbed for the life of the project and would be utilized only in the event that salvaged and stockpiled topsoil was not adequate for UDOGM reclamation success. Correspondence and permit applications associated with this site to the USITLA are included in APPENDIX B.

Face Up of Coal Seam/Preparation of Portal - As soon as possible after construction begins, the coal seam would be faced up and the portal area excavated. The portals would be located on the southeast side of canyon within the right fork. Prior to facing up the portals, the area would be cleared and grubbed, and topsoil salvaged. The extent of coal seam weathering and/or burn would dictate the extent of the pad site needed to access the solid coal face for the purpose of installing the portals. The pad would be constructed long enough to accommodate at least four portal openings (fan, belt, two intakes), while minimizing the cut face height. Minimizing the extent of the cut face is an important consideration not only in the initial mine development but also and even more so for final reclamation. The portal pad would be constructed and stabilized as necessary to conform to the safety requirements of MSHA. In order to achieve minimum disturbance of the canyon side slope, the portal pad would be cut into the solid rock as steeply as possible while still maintaining the necessary long term structural stability.

Construction of Earthen Pad and Access Roads - According to computer models of the mine site earthwork, approximately 100,000 cubic yards of borrow would have to be imported to achieve the proposed mine yard configuration. This material would be crushed to an eight inch product before being delivered to the site. Fill material, imported to the site from a commercial borrow site, would be chemically and physically similar to the native materials existing at the mine site.

Fill would be placed in 18 to 24 inch lifts and compacted to a minimum 90 percent density for nonstructural areas, and to 95 percent density in structural areas. Nonstructural areas include parking lots, material storage areas and coal storage areas. Structural areas include all areas under buildings, conveyor belts, substation, backfilled areas around culverts and reclaim tunnels, roadways, mine fan and reinforced earth retaining walls. Experience has shown that this material can usually exceed 95 percent compaction using standard wheel rolling methods, although vibratory compaction would be used in critical structural areas. All earthwork would be required to meet a minimum of 4000 pounds per square foot (psf) load-bearing capacity. Construction emphasis and priority would be given to those pad levels that are designed to accommodate key structural elements of the surface facilities. These include the pad levels associated with the coal pile reclaim system, the substation, the elevated conveyor gallery, bath house, and shop/warehouse building.

Although most of the pad levels would be constructed by filling the area with imported borrow, some pad construction would involve cutting into the existing side slopes. Under

normal construction situations sideslope cuts would be minimal, and would not usually extend up-slope more than about 20 feet above the completed pad level. The primary purpose of the sideslope cuts is not to generate fill volumes, but rather to provide uniform yard boundaries for proper alignment of ditches, roads, buildings and other peripheral structures. Cut slopes area would also be necessary to predefine the limits of the pads for the purpose of layout and engineering design. Clear slopes would also be needed to assure long term site maintenance. In order to meet the objective of yard limit definition, the slopes in some areas may actually be constructed by placing fill against the sides slopes rather than cutting into the existing hillside.

Before any slope cuts are made, topsoil would first be salvaged and stockpiled. After the topsoil has been removed and protected as described previously for topsoil stockpiling, the substrate material would be excavated. Cut material would be incorporated into the pad fill along with the imported fill material. Sideslope cuts may be greater in some selected area where pre-engineered design parameters dictate. These areas include roadways, portal highway, conveyor runs and various building sites.

Installation of Drainage Controls - As previously stated, the sediment pond would be constructed as early as possible in order to provide maximum sediment control during the term of the construction project. Once the pad levels are constructed, along with the interconnecting roadways, drainage control ditches and culverts would be constructed and culverts installed. Disturbed area ditches and culverts would be designed to handle a 10 year, 24 hour storm event. Where necessary, ditches would be lined with concrete or rip rap to prevent erosion where velocities are expected to exceed five feet per second (fps). Culvert inlets would be designed to provide adequate freeboard for design flows; outlets would be rip rapped where necessary to prevent scouring.

Construction of Coal Handling and Associated Facilities - Construction of the coal handling facilities would be scheduled to allow the mine to get into full production as quickly as possible. The underground mining operation cannot function smoothly until the elevated conveyor gallery and discharge structure are fully operational. On the other hand, the mine conveyor cannot become fully operational until the mine working area is developed far enough underground from the portals to allow the conveyor to be extended into the mine works and become an integral working part of the continuous miner production section. Once the initial mine works have begun, connected up underground with crosscuts, the conveyor can then become operational.

Other integral components of the coal handling facilities necessary for full production include the coal reclaim tunnel, crusher building, truck loadout and interconnecting conveyors. Only after this system is completely operational, can mine development and coal production begin in earnest. Other important structures necessary for full-scale mine surface production include the main substation, the water delivery system, and the mine ventilation fan.

After the critical path coal handling facilities and mine development structures are fully operational and the underground mine development is proceeding on course, full attention

would be focused on completing the ancillary surface facilities. Once the permanent structures are finished, the temporary accommodations used during construction can be removed from the site.

Buildings to be constructed at the mine site include: an administrative office, a shop/warehouse building, and a bathhouse/lamphouse building. The shop/warehouse would be used to repair and store mine equipment and supplies. The yard area around these buildings would be used for additional outside storage and parking. The bathhouse and office buildings would be sized to accommodate a workforce of approximately 130 people.

PLATE II-O is an overview of the mine surface facility. The following facilities would be constructed in conjunction with the mining operation:

- Administration Office - The main office would be a framed building measuring approximately 40 feet wide by 60 feet long. It would handle the administrative functions such as accounting, engineering, payroll, marketing and management. The main office would be located on a dedicated pad at the lower (southernmost) extent of the mine yard. Parking would be made available in the area adjacent to the main office.

- Mine Fan - The mine fan would be located at the return air portal. It would be a 12 foot diameter, direct drive, 1,000 horsepower (hp), axial vane exhausting type fan. The fan housing would include airlock travel doors for machinery and personnel. The exhaust duct work would be equipped with acoustical sound-proofing material to keep noise levels at a minimum.

- Bathhouse/Lamphouse - The bathhouse building would be a pre-fabricated metal structure measuring approximately 40 feet wide by 120 feet long. It would be located in the central part of the mine yard in convenient proximity to the mine portals. An employee parking lot would be located nearby. The bathhouse would be sized to accommodate the anticipated workforce of about 130 employees. Located at one end of the bathhouse building would be the lamphouse and the offices for the mine supervisory personnel.

- Shop/Warehouse - The shop/warehouse building would be a pre-fabricated metal structure measuring approximately 60 feet wide by 160 feet long. It would be located in the northern part of the mine yard conveniently adjacent to the mine portals. A storage area for materials and supplies would be located nearby, as would be the fuel storage, rock dust storage and garbage repository (dumpster) facilities.

- Coal Stockpiling Facilities - Coal would be brought out of the mine and delivered to the surface via a 2,000 ton per hour, 60 inch wide mine conveyor belt. The mine conveyor would exit out of a portal located about 40 feet high on the east side of the right fork of C Canyon. Even though the mine portals are located in the right fork, the run of mine coal would be stockpiled in a storage area located in the left fork.

Coal would be transported from the right fork portals to the left fork stockpile by an 800 foot long, elevated overland conveyor gallery. This 2,000 ton per hour, 60 inch wide conveyor would be covered and supported along a series of box truss galleries, elevated approximately 50 to 60 feet above the right fork mine yard. These conveyor truss galleries would be supported by several two-legged steel bents spaced approximately 120 feet apart. After crossing the point that separates the right and left forks, the conveyor would terminate at a cantilevered discharge structure at a location above the coal stockpile area in the left fork. A conical coal pile would be built directly below the discharge structure. The pile would be about 80 feet high at full capacity and contain about 30,000 tons of coal. Additional storage can be obtained by pushing the pile northward onto the coal storage pad extending up the left fork.

- Coal Reclaiming Facilities - A 13 foot diameter multi-plate reclaim tunnel would be located below (underneath) the coal pile. Two reclaim draw down ports located at the end of the tunnel would allow coal to be reclaimed from the bottom of the pile directly onto a 54 inch reclaim conveyor located within the tunnel. Each reclaim port would contain a pile activator, a hydraulically operated single bladed shut-off gate, and a discharge chute leading to the reclaim conveyor. Each port would be capable of loading the reclaim conveyor at a full capacity of approximately 1,400 tons per hour. Once the coal has been loaded onto the reclaim conveyor, it would then be transported out from underneath the pile. The reclaim conveyor would bring the coal out of the tunnel and transport it to a crushing/screening building.

  The crusher building would be an open steel structure containing a 40 hp, eight by 20 foot scalping screen which would remove all minus two inch coal ahead of the crusher. The plus two inch coal from the top screen deck would be fed to a 300 hp hammermill impact crusher where the coal would be reduced to a two inch product. All transfer points within the crusher building would utilize enclosed chute work to contain and control fugitive dust emissions. These transfer points include the transfer from the reclaim conveyor to the screen, the screen unders (minus two inch) to the loadout conveyor, the screen overs (plus two inch) to the crusher, and the crusher discharge (minus two inch) to the loadout conveyor.

  Within the crusher building would also be located a self cleaning tramp iron magnet (located at the reclaim conveyor discharge pulley ahead of the crusher), and an automated sampling system. The crusher building and the coal reclaim tunnel would be separated by a 25 foot wire reinforced earth wall. The crusher building would be located on a bench on the lower (down-canyon) side of the wall and positioned in such a manner that gravity flow would aid the movement of coal through the screening, crushing, and sampling operations.

  From the crusher building the crushed and screened two inch coal would then be loaded onto a covered 48 inch wide loadout conveyor operating at a rate of 1,400 tons per hour. The coal would then be transported to an automated truck loadout station. The truck loadout would be an elevated steel frame structure constructed

high enough to allow the trucks to be positioned under a contained chute during loading. Electronic sensors would determine when the truck is properly positioned under the chute. The feed conveyors (i.e., loadout conveyor and reclaim conveyor) would start and stop automatically to load the individual truck trailers with a predetermined amount of coal. Certified belt scales would be used to control the loading process.

The truck loadout would be located at the upper end of the truck loop. The loop would be long enough to accommodate up to four empty trucks in the queuing lane waiting to be loaded. After being loaded, the trucks would leave the mine site and haul the coal to a train loading facility located off-site. All conveyors would be covered and all conveyor transfer points would be enclosed.

- Electrical power - As previously mentioned as part of the proposed action, an overhead 69 KV power line would be installed to the mine. The proposed power line would terminate at a substation on the mine site. The mine substation would be located in the right fork below the portal bench. The substation would contain a 12 MVA 69 kV/12.5 kV transformer, along with various other electrical power control apparatus (air-break switches, visual disconnects, bussing, ground fault detection, vacuum circuit breakers, power factor capacitor banks, metering equipment, and a control room). From the secondary side of the substation, power would be distributed throughout the mine yard and to the underground workings at 12.5 kV. At various locations within the mine yard, the power would be routed through a set of 12.5 kV/4160 V/480 V transformer banks and motor control centers to operate the surface equipment. These combination transformer/motor control center units would be located at the crusher building, overhead conveyor drive station, mine fan, and shop/warehouse.

- Water Facilities - As previously mentioned as part of the proposed action, a water line from East Carbon City would be constructed to serve the culinary/potable requirements of the proposed mine. Water storage facilities (tanks) would be located on the surface to provide storage for usage and as pre-storage before being pumped into the mine to an underground storage sump for use in the mining operation. The surface storage tanks would be located above the bath house to provide sufficient static head (pressure) for yard distribution. Sewage from the administrative office and bathhouse would be treated by separate underground septic tanks and drain fields.

- Other Structures - Additional, smaller structures include miscellaneous storage sheds, pump house, above ground storage tanks (for fuel, water, and dust control chemicals), powder magazines, rock dust storage tanks and trash containment structures. All buildings and structures would be made of conventional construction materials including wood, masonry, or steel. Buildings would be color coordinated to blend in with the natural surroundings.

Potential Mitigation Areas - Two areas have been identified as potential sites for mitigation projects covering operational impacts associated with the proposed action. An area identified by the BLM as potentially addressing mitigation required for the anticipated wildlife impacts of the proposed action, would be located on public land at S.L.B.&M. T. 14 S., R. 13 E., Section 22 and 23 (FIGURE II-7). Mitigation activities associated with this area would include the hand planting of approximately 320 acres with 200 seedlings per acre. The species would be selected for their forage potential for area winter big game.

To address potential impacts to grazing use of the area, creation of water sources within the area could be constructed. This could either involve the use of the proposed water line, with a constructed tap line to access various troughs within the grazing use pastures, or construction of surface water collection ponds (PLATE IV). The approximate location of troughs would be T. 14 S., R. 13 E., Section 29, NE 1/4 NW 1/4, and Section 30, SW 1/4 SW 1/4.

To reduce the direct impact of the proposed undertaking on site 42CB-1184, a research design would be developed to analyze the adaptive lifeways of the people of early twentieth century rural Utah in general, and of the Clark Valley in particular. The research design would be multi-disciplinary in approach and involve not only analysis of material culture, but also utilize data from supplemental floral and faunal analysis to provide detailed information. A program of historical research, detailed mapping and controlled excavation would be used to implement the research design. Completion of the research would greatly increase the historical information available on historical homesteading in rural Utah. Findings from this detailed investigation would be used during the Section 106 of the National Historic Preservation Act (NRHP) consultation with the Utah State Historic Preservation Officer (USHPO) regarding these sites.

Though actual project impacts associated with the proposed action are to be determined within this document, either, both, or a combination of these mitigation projects would adequately address operational life of project impacts.

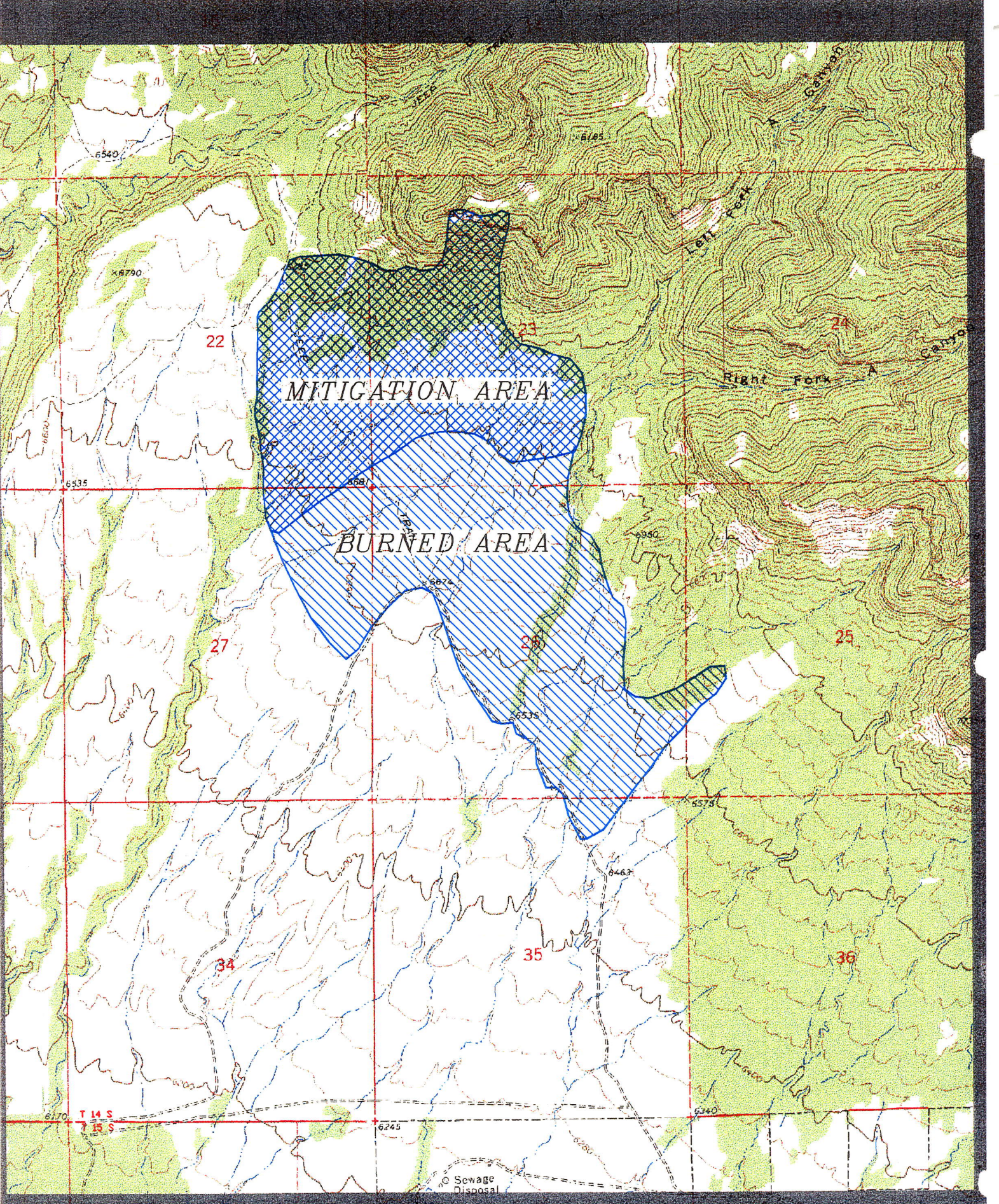


Figure II-7
BLM Mitigation Area
T 14 S, R 13 E, Sections 22, 23, 26