SITE SPECIFIC ANALYSIS
PART 2

DRAFT

ENVIRONMENTAL STATEMENT

Development of Coal Resources in Central Utah

Cover:
Artist's sketch of the abandoned portal facilities of the Larson-Rigby mine located in spruce-fir, Wasatch Plateau coal field. The task force found the site used as a mid-day bed ground by a group of does and their fawns.

Since the preparation of this document, significant changes have occurred in the roles of the Office of Surface Mining, U.S. Geological Survey, and the Bureau of Land Management regarding Federal coal management. The basic roles are defined in Division of Functions and Responsibilities Concerning Management of Federal Coal Between the Office of Surface Mining, U.S. Geological Survey, and Bureau of Land Management, signed on July 5, 1978, by Under Secretary of the Interior, James A. Joseph. This draft EIS does not reflect the responsibilities of OSM, BLM, and USGS as outlined in the above-mentioned document. Such changes in responsibility will not affect the impacts defined in this EIS. Appropriate changes will be made in the Final Environmental Statement to reflect the provisions of the agreement.

ENGLISH-METRIC CONVERSION FACTORS

To convert English unit	Multiply by	To obtain Metric unit
Inches (in)--------------	2.54	Centimeters (cm).
Feet (ft)----------------	3.048×10^{1}	Centimeters (cm).
	3.048×10^{-1}	Meters (m).
Miles (mi)---------------	1.609	Kilometers (km).
Square feet (ft^2)--------	9.290×10^{-2}	Square meters (m^2).
Acres--------------------	4.047×10^{-1}	Hectares (ha).
	4.047×10^{-3}	Square kilometers (km^2).
Acre-feet (acre-ft)------	1.233×10^{3}	Cubic meters (m^3).
	1.233×10^{-3}	Cubic hectometers (hm^3).
Cubic yards (yd^3)--------	7.646×10^{-1}	Cubic meters (m^3).
Pounds (lb)--------------	4.536×10^{-1}	Kilograms (kg).
Short tons (tons)--------	9.072×10^{-1}	Metric tons (t).
Pounds per acre (lb/acre)	4.883	Kilograms per hectare (kg/ha).
Btu/lb-------------------	2.326	Kilojoules per kilogram (kJ/kg).
Gallons (gal)------------	3.785×10^{-3}	Cubic meters (m^3).
Gallons per minute (gal/min)--------------	6.309×10^{-2}	Liters per second (L/s).
Degrees Fahrenheit (°F)--	([1])	Degrees Celsius (°C).

[1]Temperature in °C =(temperature in °F - 32)/1.8.

DEPARTMENT OF THE INTERIOR

DRAFT

ENVIRONMENTAL 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

1978

VOLUME CONTENTS
Part 2
SITE SPECIFIC ANALYSIS

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: Unites States Steel Corporation

Site Specific Statement

United States Steel Corporation

B Canyon Mine

CONTENTS

Page

Page

ILLUSTRATIONS

TABLES

UNITED STATES STEEL CORPORATION

B CANYON MINE

CHAPTER I: DESCRIPTION OF THE PROPOSED ACTION

A. INTRODUCTION

A plan 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), has been submitted for U.S. Geological Survey (USGS) approval by the United States Steel Corporation, in accordance with Title 30 (Mineral Resources) CFR Part 211 (Coal Mining Operating Regulations). Also, plans and land-use applications for all of the proposed primary surface facilities to support the underground operation have been submitted for Bureau of Land Management (BLM) 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.

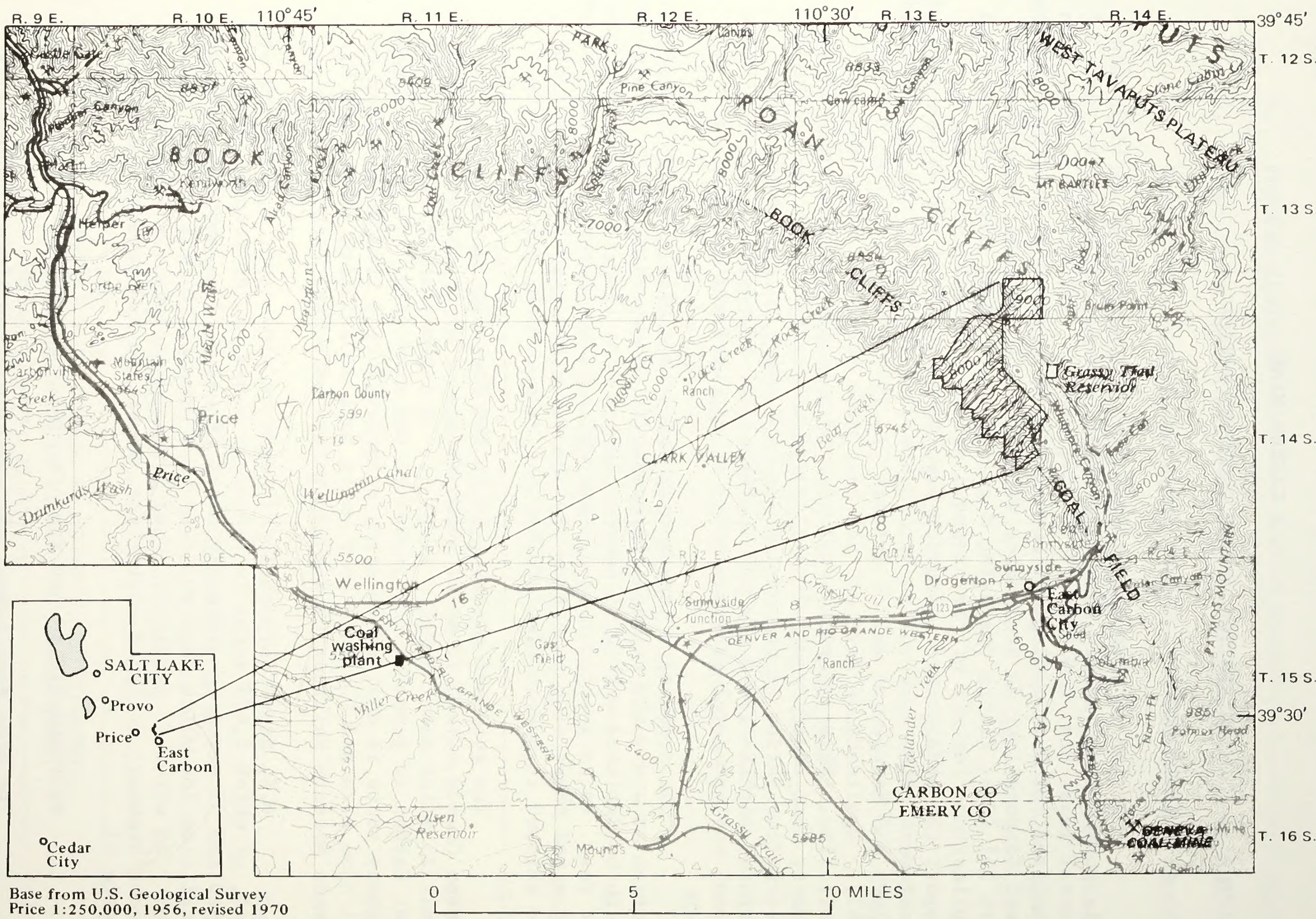
The proposed B Canyon mine would be similar in size and production to and would replace the company's Geneva mine, which is expected to be depleted within 10 years. Geneva mine coal, about 600,000 tons per year, is rail-shipped to a preparation plant near Wellington, washed and mixed there with coal 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.

U.S. Steel Corporation intends to mine about 3,922 acres of coal, of which 2,629 acres is federally owned, 1,261 acres is State owned and 32 acres is privately owned (figs. 2, 3). Support surface facilities for which rights-of-way have been filed will require use of about 750 acres of federally owned land and include a telephone line, access highway, railroad, waterline, powerline and several buildings (table 1).

B. PROPOSED MINING AND SURFACE OPERATIONS

The mine development plan and projected mining sequence is



Base from U.S. Geological Survey
Price 1:250,000, 1956, revised 1970

Figure 1.--Index map showing United States Steel Corporation's B Canyon property, Carbon County, Utah.

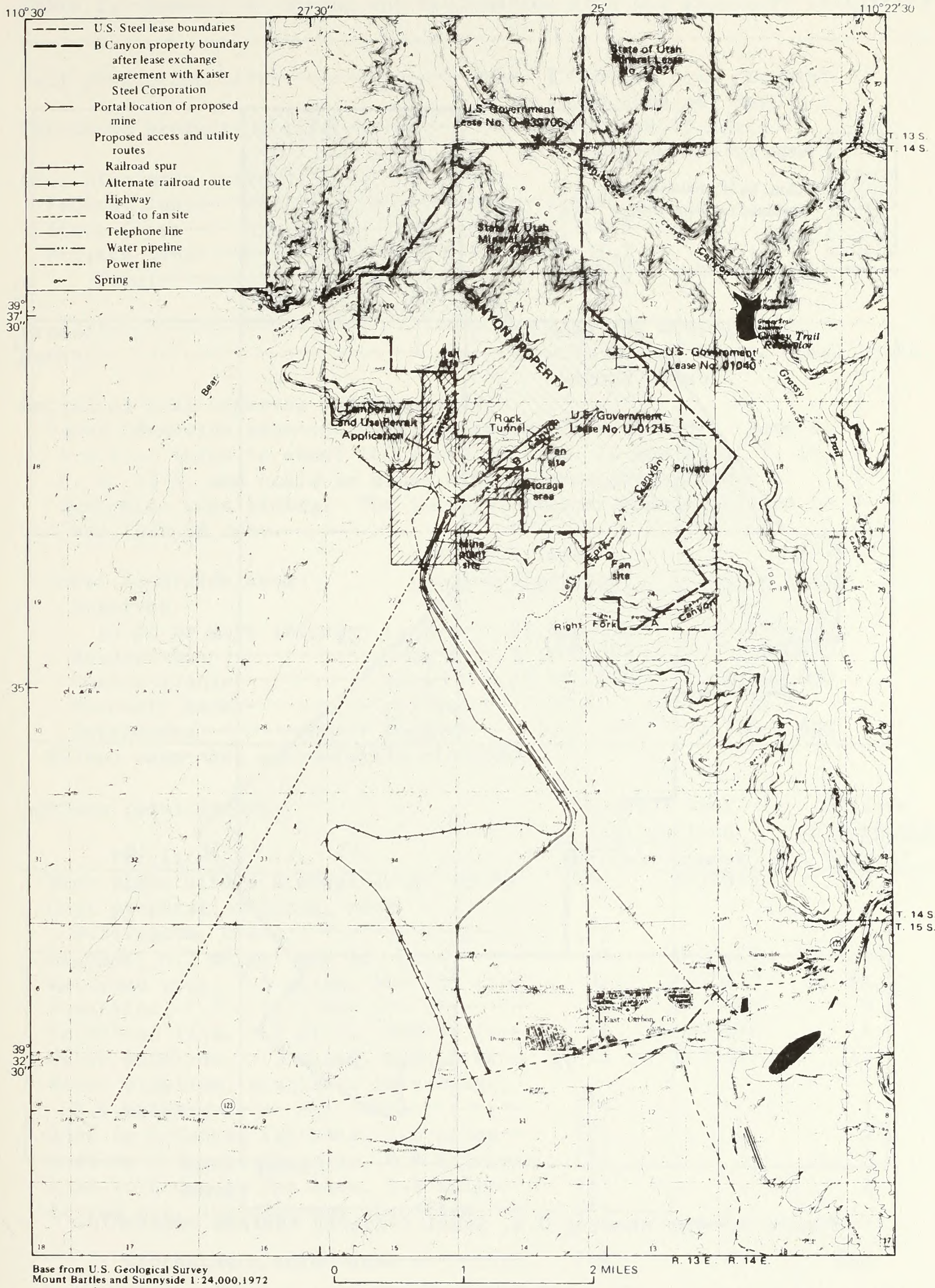


Figure 2.--Map showing coal lease and proposed B Canyon mine surface facilities.

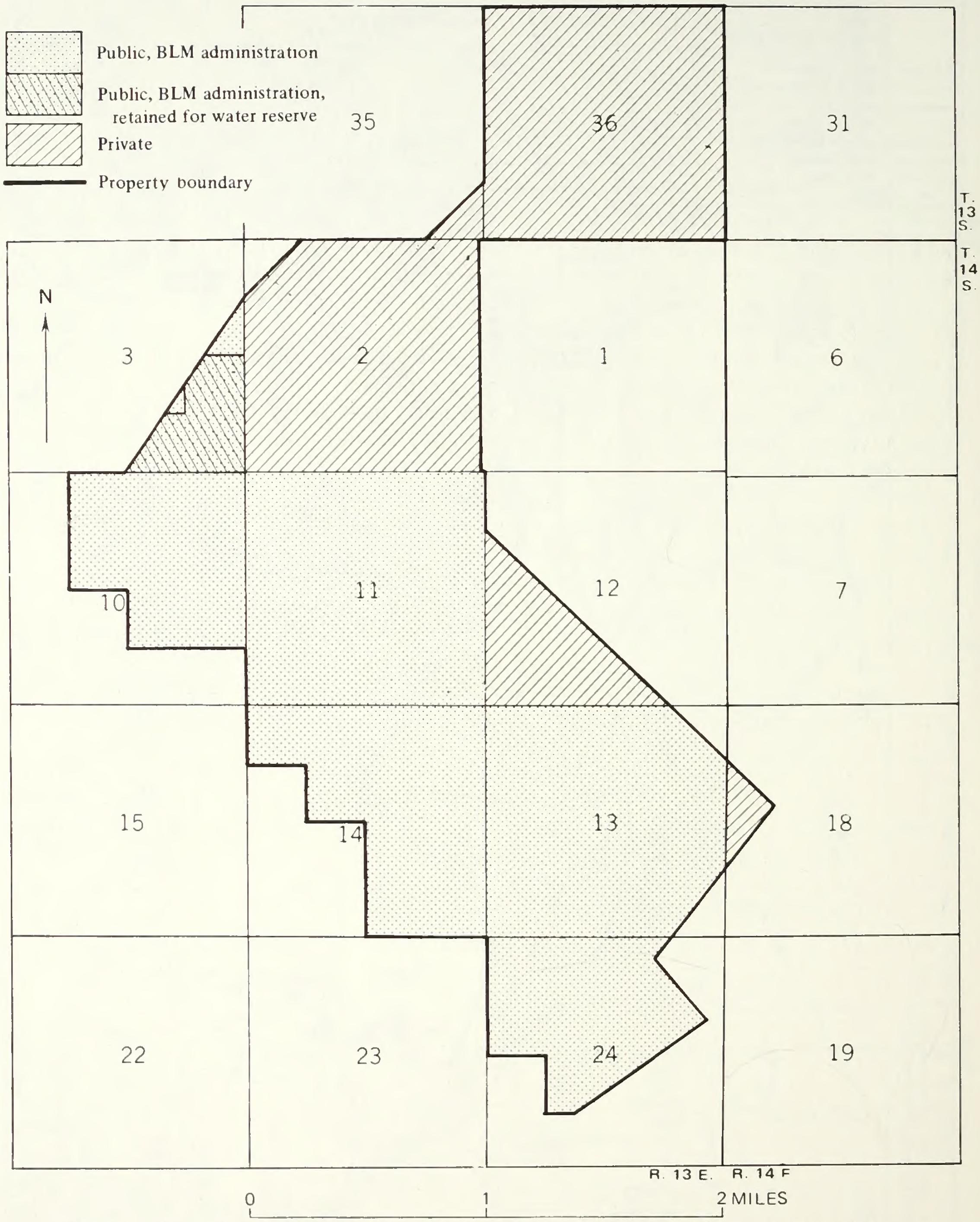


Figure 3.--Map showing U.S. Steel property surface ownership.

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

Full production life	1,000,000 tons per year 4,000 tons per day
Estimated production life	More than 25 years
Mine plan area (acres)	
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.

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

See footnotes at end of table.

Table 1.--Summary of mining and reclamation plant and ancillary facilities--Continued

Mine plant at mouth of B Canyon includes: 60-75 acres-- Office building, 2,100 sq ft; bathhouse and training building complex, 12,000 sq ft; surface shop and warehouse, 14,000 sq ft; mine-car dumping station; transfer and crusher building; bulk oil tank, 20,000 gals; roof-bolt storage shed, 3,000 sq ft; 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; top-soil storage area3 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, wood for roof support-------- 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 w 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.

given in detail in the submitted mining and reclamation plan. This information is available for public review in the office of the Area Mining Supervisor, USGS, Salt Lake City, Utah.

The following description is summarized from the submitted mining plans and subsequent communications from the company.

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 Canyonwarea 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 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 and roof bolts placed in the room-and-pillar mined areas. 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 hauled to the present preparation plant near Wellington (figs. 2, 4).

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 chapt. VIII). The proposed powerline would originate farther west. Table 1 gives the lengths of access routes, the areas included in individual rights-of-way of standard width, and estimated areas of vegetation removal and surface disturbance from construction. 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 326 acres.

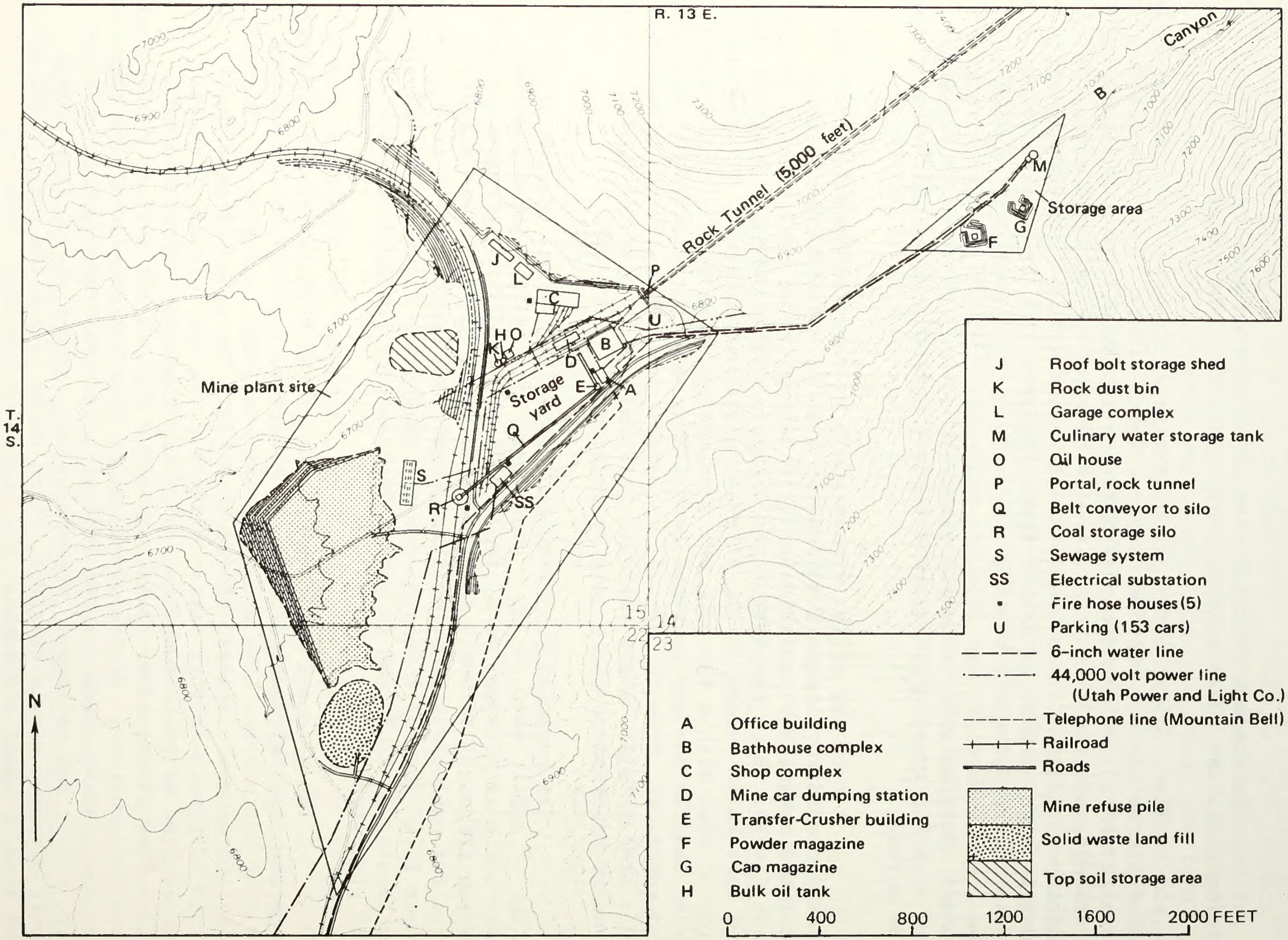


Figure 4.--Map showing proposed surface facilities at mine plant and storage area.

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.

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 would be mined during the construction period. Trucks would transport the cgal so mined; the present road in B Canyon would, therefore, have to be improved. Also, temporary loading and dumping facilities would have to be installed. The mining plan does not include details or specifications on needed facilities.

For purposes of analysis in this report, the Task Force has assumed that 290 employees including support personnel would be required to mine 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 operatgr 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 eining 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 afd 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

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 and Reclamation Act (SMCRA) of 1977 (PL 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, in this statement the applicable initial regulations are considered as a required Federal mitigating measure.

The mining and reclamation plans will be returned to the operator together with a request that they be revised in accordance with the applicable initial regulations. As soon as the mining and reclamation plans are revised and returned to the U.S. Geological Survey (USGS) they will be evaluated with the Office of Surface Mining to determine compliance with the requirements of Federal regulations at 30 CFR 211 and 30 CFR 700. The eining and reclamation plans cannot be approved until they conform to all applicable requirements.

1. LAND

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. This will require a network of monitoring stations. The mined area will be reduced near coal outcrops in the Book Cliffs to insure sufficient support for overburden and to avoid excessive rock slides and rock falls from the cliffs.

All suitable topsoil within a proposed disturbed area will be stockpiled to specifications of the BLM.

Soil will be kept out of drainageways during construction to avoid loss or impacts on water quality.

The revised Utah State Antiquities Act (1977) provides for the preservation and (or)wprotection of paleontological values on State land. Discovery of such values on Federal land will be brought to the attention of the local BLM land administering office.

2. WATER

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 authorizing officer of the proper office, to safeguard the public interests, after investigation of the facts, circumstances, and conditions in connection with each individual case."

Mine water shall not be discharged unless it meets the quality standards required by the State (title 73-14-1, et al.) of EPA, whichever is applicable.

3. AIR

Each 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 should use an appropriate combinatign of the following fugitive dust controls:

1. Pavement or equivalent stabilization of all haul roads used or in place for more than one year.

2. 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.

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

4. 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.

4. WILDLIFE AND FISHERIES

The vicinity of proposed use will be examined for black-footed ferrets. Such examination will include consultation with the U.S. Fish and Wildlife Service,wunder the provision of sec. 7 of the Endangered Species Act (PL 93-205).

5. VEGETATION

The access road right-of-way will be fenced. The fence design will permit deer passage. 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 for threatened or endangered plant species will be taken. Any listed species found will be protected. (See part 1, chapt. III-7, Endangered Species.) Reclamation to restore vegetation to 90 percent of original productivity may require as much as 10 years, and, if so, it will be required. (See part I, chapter IV.)

6. ARCHEOLOGIC AND HISTORIC VALUES

The BLM and USGS entered into an agreement in July 1977, to protect the cultural resources on mineral leases. Under the agreement the BLM will be responsible for the cultural resource protection requirements for mineral leases on public lands.

The authorizing office (BLM) would comply with the basic 1906 Federal Antiquities Act (PL 59-209; 34 Stat. 225), the National Historic Preservation Act of 1966 (PL 89-665, 80 Stat. 915), the Historical and Archeological Data Preservation Act of 1974 (PL 93-291), and the subsequent Federal regulations which provide legal backing and instruction for cultural resource inventory and protective consideration of sites.

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 culturad 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).

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 (fig. 1, 2). The highway and railroad routes climb from 6,100 feet near East Carbon to 6,800 feet at the plaftsite.

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, part 1, chapter II.

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.

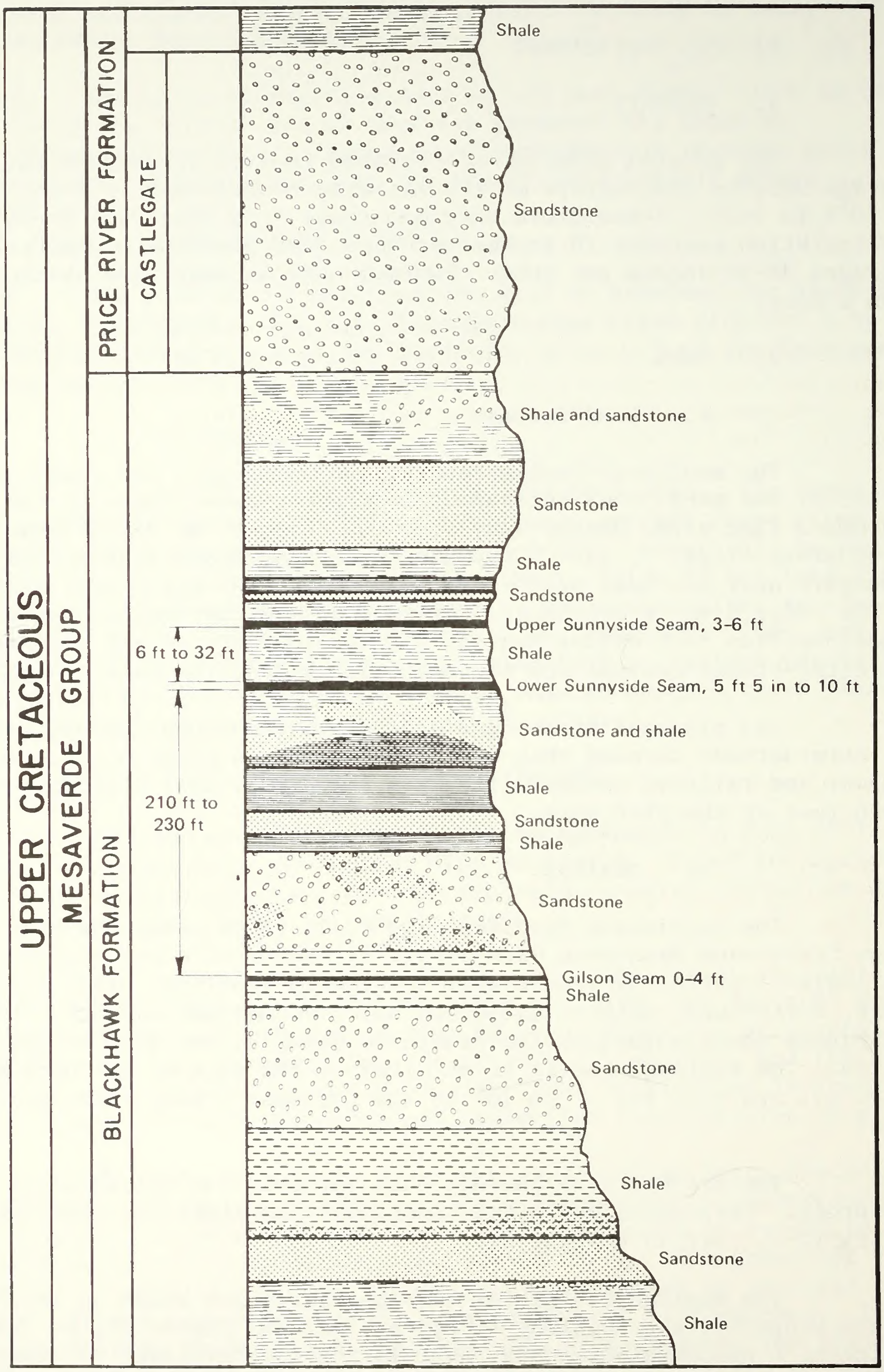


Figure 6.--Sketch showing age and sequence of rock units in the B Canyon property area.

c. Energy and Minerals

Coal, the major energy resource, and the Book Cliffs coal field, are discussed in part 1, chapter II.

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 (part 1, chapt. II, fig. II-5). No use is being made 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. (See part 1, chapt. II, fig. II-5).

The pre-Cretaceous rocks, in which uranium deposits have been found in the area of the San Rafael Swell 40 miles to the south, are present in the subsurface at B Canyon, but they have not been tested by drilling.

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.

<u>Soils on clifflands and canyons</u>.--These soils occur on the steep terrain of the Book Cliffs and have formed primarily from parent materials of sandstone and minor shale. They are typically medium textured, thin to moderately thick, and cobbly to stony. They are well drained to excessively drained.

On south aspects, soils tend to be thin and rocky with a low revegetation potential. Many rocks crop out on these hot, dry slopes. On north aspects, soils are cooler, moister, better developed, and more productive.

<u>Soils on pediments</u>.--Soils in this area 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 thick, 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 steepen locally along drainage dissections and small ridges, particularly near the mouth of B Canyon. Where slopes are steeper, soils are more cobbly and stony.

Erosion hazard by water action, should vegetation be removed, is low to moderate. Wind-erosion potential is moderate.

The probability of successful range reseeding, based on reseeding per year, is estimated at 3 to 5 out of 10 years.

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 commun., 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, which flows through Sunnyside and East Carbon City and generally southeastward to the Price River (figs. 1, 2). 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 frgm 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 aquifers 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

Particulates would be the only significant contributors to air pollution at the B Canyon mine. Increases in concentration of other pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide and photochemical oxidants would be insignificant.

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 (ug/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 demonstrated an average of 67 miles for the period September 1970 to March 1971.

Average visual range calculated from particle size distribution at Bear Creek and Huntington Canyon in 1974, was approximately 45 miles.

Analysis of photographs taken at Clawson, Utah, 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, have shown averages between 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, chapt. 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 varietywof 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, cougar (mountain lion), black bear, coyote, red fox, gray fox, kit fox, bobcat, raptors, chukar partridge, blue and ruffed grouse, mourning doves, and rabbits.

The proposed mine would be in the southern part of Utah's 1,169,000-acre deer herd unit 27B (part 1, chap. II, fig. II-18). Winter range is the limiting factor on deer population. All mine facilities would be in winter deer habitat. Winter deer habitat in the B Canyon mine vicinity (fig. 7) are areas covered by the Pinyon-Juniper and Grassland types and a transitional cover of pinyon-juniper-mountain brush-grass. The following shows deer habitat affected by the proposal and the optimum population for deer herd unit 27B (Utah Dept. of Fish and Game, 1967; written commun., L. J. Wilson, 1977):

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

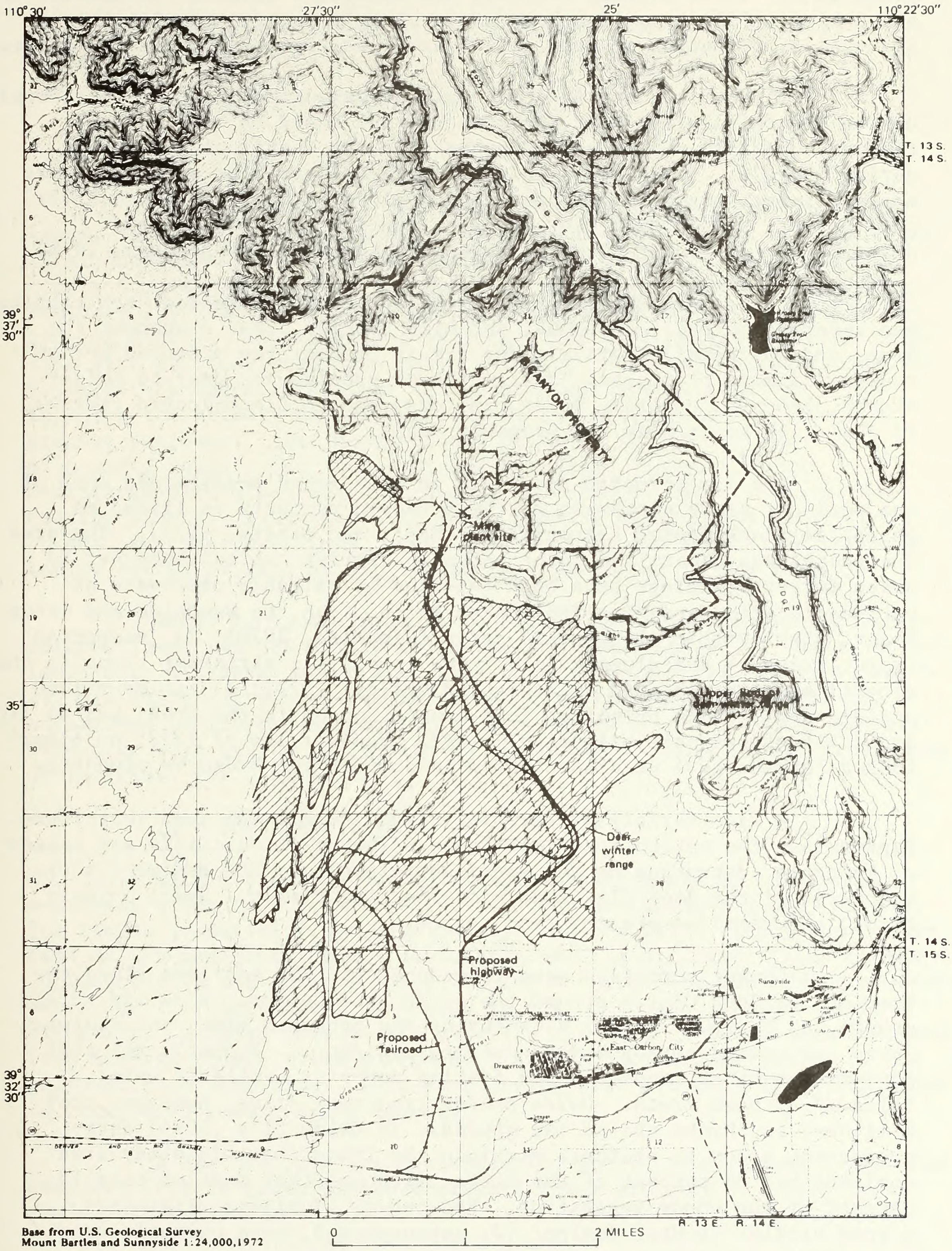


Figure 7.--Map of B Canyon area showing winter range of deer.

Cougar (part 1, chapt. 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. No census methods are in general use to determine black bear populations, but 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).

Cottontail rabbits, black-tailed and white-tailed jack rabbits, and several squirrel, chipmunk, and mice species occur thoughout the area, and white-tailed prairie dog are in or near the proposed access routes and mine plantsite. Most of these species are prey to badgers, skunks, bobcats, coyotes, foxes, raptors, and to black-footed ferrets, if any exist in or near the property areas.

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 (Scott and others, 1977). The area designated was determined to be potential ferret habitat because: 1) seven ferret sightings have been reported by reliable observers at various locations ranging from north Price, Utah, to Woodside and Green River, Utah, within the past 11 years (Hinckley, 1970); 2) suspected ferret trenches and plugged holes were found in prairie-dog towns in the general area of reported sightings (Hinckley, 1970); 3) white-tailed prairie dogs, their principal food source, occur in the area; and 4) it is within the ferrets historical range. 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 found 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, followed by nest trees. Doves prefer tree nest sites; however, they will nest in shrubs afd on the ground. In Caldwell's (1964) dove-production study in southern Michigan, he found that his study area conifers had 86 percent of the nests, although they made up only 18 percent of the woody vegetation. Red cedars (Junipers virginiana), a tree similar to Utah Juniper (J. osteosperma), were commonly used.

There are no gamefish in the immediate area.

Several species of lizards, snakes, and other reptiles are found throughout the area.

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 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 darectly proportional to local mine employment (part 1, chapt. II). Price, about 25 miles to the west (fig. 1), is the nearest major shopping center to the communities.

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

Archeologically, little is known of the B Canyon property area and close vicinity, adthough 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.

A reconnaissance survey of the property area, which did not locate any archeological sites, was done in September 1977, by K. K. Pelli, Utah (Pierson, 1977).

One small historic building, much in ruin, was found in B Canyon near the mouth of the canyon. Indications (wire nails) are that the cabin is of recent origin.

The National Register of Historic Places lists no cultural values for the area.

7. RECREATION

Recreation use on the property, transportation and utility corridors, and plantsite is low (less than 500 visitor days annually). The potential for recreation is slight. No services or facilities have been developed for recreation, and none are planned. Access is limited to four-wheel drive or heavy-duty vehicles on 15-20 miles of interior, low standard roads. The vicinity of proposed ancillary facilities lacks perennial potable water, significant user attractions, or outstanding and unique qualities.

Potable water and minimal user attractions are present on the property northeast of the proposed plantsite, but use is restricted primarily to hunting big game on horseback because of inadequate or nonexisting access.

No recreation use or activity records have been kept, but on-site evidence and observations (BLM, U.S. Steel, Utah State Division of Wildlife Resource, and Interagency Task Force on Coal personnel) indicate that primary recreation uses and activities are: a) driving for pleasure in heavy-duty or four-wheel drive vehicles and sightseeing, b) hunting mule deer and small game species, c) target and practice shooting, and d) gathering pine nuts and firewood, rockhounding, etc. Some predators are trapped and ORV's are used on the pediment southwest of the property. ORV use is restricted, even in this area, because of the rocky, dissected terrain.

Recreation users are primarily from Carbon and Emery Counties, and activities are oriented toward daytime use and travel.

The regional recreation resource, as it relates to secondary impacts as a result of this proposal, is discussed in part 1, chapter II.

8. ESTHETICS

The two areas that would be impacted are the slopes southwest of the Book Cliffs (fig. 2) and the toeslopes at the base of the Book Cliffs. The southwest slopes, where the proposed main access road, railroad, and power, telephone, and waterlines would be located, have minimal (class C) scenery quality. Pinyon-juniper has been removed and the area replanted to grasses and shrubs. Landforms, line, color, and texture have little variation and the area demands little notice. The toeslopes, 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. Visual amenities are extensive, but not outstanding or unique (fig. 5).

The plantsite and the various access routes and service lines to it would involve lands located from 3-15 miles from US 6, the only major travel routes in the area (fig. 1). Little if any development would be seen from this route. Segments of the access road, railroad, and power, water and telephone lines, would be visible within 3 miles of Dragerton, Sunnyside, or parts of U-123, and would fade into the background or be hidden at greater distances.

The plantsite would be located in a seldom-seen area that lies behind a ridge between B Canyon and the pediment to the southwest. Except for a low-standard road and a test portal entry, the natural landscape of B Canyon is presently undisturbed. Industrial modifications of the natural landscape character within B Canyon or on the pediment to the south would cause little concern to the general public. The area is seldom visited, except for individuals living in East Carbon, and Sunnyside, where similar modifications are commonplace.

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 after the life of the project should restore a natural landscape c'aracter to the area.

C. FUTURE ENVIRONMENT

The B Canyon mine is located near presently 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-C and I-D. Methods, procedures, or changes that might further reduce adverse environmental impact are suggested and described in chapter VIII.

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 2). The amount of earth that would be moved is not estimated in the mining plans.

The surface above the mined area of 3,922 acres would be subject to subsidence (part 1, chapt. III). Studies of comparable mined lands by Dunrud (1976) indicate at the planned depth of mining, 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. Mining of the overlying Upper Sunnyside seam might result in additional subsidence.

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, there is no record ofwsubsidence in adjacent areas, mined for 75 years, to reach hazardous conditions.

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 awresult 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 fossiliferous 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 presently assessed due to a general lack of specific data on such activities.

Due to the present lack of data and accepted evaluatory criteria for determination of significance, no meaningful assessment can be presently 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 nonrecoverable coal is 27 million of the 48 million tons of total estimated reserves. An unestimated amount of coal in the Upper Sunnyside and Gilson seams is also nonrecoverable (table 2). 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 nonrecoverable 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 2). On about 13 acres only some 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 raifstorm. Unforseen changes in landforms and erosion control structures also would affect erosion rates (Pacific Southwest Inter-Agency Committee System, 1968). 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). 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 (chapt. VI).

2. WATER

a. Water Supply

1. <u>Surface Water</u>

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, chapt. III). 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

The main sources of total suspended particulates (TSP) will be the mine portal and dust from auto and truck travel on unpaved roads, coal storage, transfer, and conveying.

During the first 2-3 years, coal will be transported from the portal to rail by truck. The transport will be over an unpaved road less than 1 mile (1.5 km) in length. Thereafter transport to the railroad will be by conveyor. AeroVironment (1977) determined the maximum 24-hour TSP increment during the period coal is truck hauled to be 150 ug/m^3 within 110 yards of the road if the surface is unpaved and watered. This is equal to maximum Federal secondary NAAQS standard (which may not apply in this case). 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 on an unpaved road).

Due to the large size of coal particles, most will settle out within six-tenths of a mile (1 km) downwind of the mine.

Visibility would be impaired in the immediate vicinity of the road from dust associated with vehicle travel to and from the mine. The impact would be highly localized in nature and short-term in duration, being confined to periods of heavy traffic.

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 to mine facilities. 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 and noise, lights, activity, and traffic associated with mine construction and operation. Habitat destruction can be measured and quantified for some species, but avoidance caused by mine construction and operation cannot be precisely quantified.

Offsite impacts indirectly attributable to mining would accrue. Improved access into the B Canyon vicinity would bring more rockhounds, hunters, and casual explorers into an area now relatively unvisited. More visitors would disturb more sensitive species, such as black bears, cougars, 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 2). The destruction would affect different wildlife in different ways. There would be 228 acres of winter deer range destroyed, not including the habitat destroyed (in construction) 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 (at its optimum capacity). This 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. In this zone deer feeding could be expected to be 50 percent less than elsewhere in this wintering range. Avoidance would be expected to be total at disturbance sources, decreasing with distance outward.

Implementing the proposed action would destroy 75 acres of winter deer range in the pinyon-juniper-mountain brush-grass complex, and deer would be expected to partly relinquish 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, relinquishing partially 158 more such acres would reduce potential another five head. Additionally, 153 acres of replanted Grassland deer winter range would be destroyed, and deer would be expected to partly relinquish 532 acres more (about 5 percent of the Grassland deer winter range). In summary, habitat destruction would reduce the reseeded range potential by 12 head, and relinquishment would reduce the potential by another 21 deer.

Added to the loss of the potential to support 44 deer would be fawn production. The 5-year population structure means for 1972-76 in unit 27B indicated the herd was made up of 32 percent bucks and 68 percent does (47 bucks; 100 does), and had an annual production of 71 fawns per 100 does. This translates into a loss of 21 fawns with deer numbers at the full potential.

The loss of potential to support deer and intrusion into B Canyon would probably reduce the cougar population potential in unit 27B by two animals, one male and one female, based on Seidensticker's findings (1973) that cougar 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 presently 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 would make water available for chukars in new areas, probably benefiting them. Base data are insufficient, however, to predict how many chukars would be affected or whether beneficial effects would offset adverse effects.

The impacts on mourning dove 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 dove may use the nine known springs (fig. 2). Drying of these springs would cause doves to 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 would provide a key requirement for dove nesting, as all other habitat elements appear available. Whether the expected beneficial effects will equal the adverse effects on mourning dove 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, chapt. 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, chapt. II).

The presence of 150 workers and their families during the construction period would increase pressure on game and fish. The demand for game and fish would increase, and illegal activities related to all wildlife would be expected to increase.

B. CULTURAL ENVIRONMENT AND LAND USE

1. RANGE AND TIMBER

The vegetataon 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.

2. 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 will help maintain the East Carbon-Sunnyside, and Price area business economy, the city and county tax base, and total regional income, currently dependent in part on the Geneva mine.

3. TRANSPORTATION AND UTILITIES

Impacts would result from a railroad spur, access highway, power and telephone lines, and a waterline (fig. 2, tables 1, 2).

The proposed road and railroad spur would intersect or cross U-123, disturbing vehicular traffic somewhat during construction. Traffic safety would be impacted but railroad and road traffic to the Geneva mine would decrease, enhancing safety.

Additional 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.

4. ARCHEOLOGIC AND HISTORIC VALUES

No sites were found during Pelli's cultural resource survey, however, 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 due to mining 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.

5. RECREATION AND ESTHETICS

Developing the proposed mine would displace present minor recreation in the plantsite or property area (fig. 2). Recreation on the pediment south of the plantsite would increase because of improved access.

Except for hunting, trapping, and ORV use, impacts to the recreation resource from legitimate increased use would be minimal, even if use increased severalfold. Road kills of wildlife from increased traffic and increased speed on improved access roads, increased hunting pressure, and habitat loss could reduce wildlife populations and subsequently lower hunting and trapping success. Mule deer harvest within this part of deer herd unit 27B (Range Creek) could be reduced as much as 5 percent (35 to 45 deer annually). The loss of trapping success would be in proportion to loss of prey species. Increased ORV use on the pediment could result in disturbance and loss of soil, vegetation, wildlife habitat, wildlife, and watershed values.

An increase in littering and vandalism would result from increased use of the area. Noise and air pollution within and adjacent to the area would increase.

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. Developed facilities and activities associated with the proposal would be viewed primarily on site. Based on orientation of the majority of anticipated visitors 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 to the area would have major concerns about modifying the ranching-natural landscape character to one including industrial facilities and activities.

CHAPTER IV: MITIGATING MEASURES

Approval of the proposed action will include requirements for mitigating measures to eliminate or minimize adverse impacts. The operator is committed to those mitigating measures proposed in the mining plan, as described in chapter I-C, and is subject also to other legally enforceable mitigations, as described in chapter I-D. Other mitigation measures are discussed in chapter VIII.

CHAPTER V: ADVERSE EFFECTS THAT CANNOT BE AVOIDED

A. NATURAL ENVIRONMENT

1. LAND

Unavoidable destruction, disturbance, and removal of paleontological resources, both exposed and unexposed, would occur. The significance of this impact cannot be presently meaningfully assessed due to the lack of data and evaluatory criteria.

Adverse effects on the land surface from surface facilities and waste disposal would not be totally mitigated by reclamation after mining, but nearly all the land could probably be returned to its previous uses. In undermined areas, however, subsidence and potential subsidence would endanger surface construction, even though grazing and hunting would not be affected.

The overburden is too thick for the coal to be recovered other than by underground mining, but 50 percent or more of the minable coal in the Lower Sunnyside seam must remain unrecovered in pillars and barriers. Although the Upper Sunnyside seam is of minable thickness over about 1,740 acres of the southern part of the property, less than 10 percent is minable because proximity to the lower seam makes mining unsafe.

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, erosion rates may be expected to increase two to three times that at present, and return to near natural rates following required erosion control and revegetation.

2. WATER

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.

3. AIR

Twenty-four hour TSP increments would not exceed the secondary NAAQS standard of 150 ug/m^3. Temporary truck haul would create 310 tons TSP per year. Visibility would be impaired near the portal and road.

4. WILDLIFE AND FISHERIES

Some wildlife habitat would deteriorate from destruction and disturbance. Vehicle-wildlife and bird-powerline collisions would occur. These impacts would reduce wildlife numbers and reduce the habitat potential to support them.

B. CULTURAL ENVIRONMENT AND LAND USE

1. RANGE AND TIMBER

Development of the proposed mine would result in a loss of 25 AUM's of grazing capacity per year and some disruption of normal grazing patterns, for the life of the proposed mine.

2. ARCHEOLOGIC AND HISTORIC VALUES

Increased population in the area may result in vandalism to the cultural resources within the region. The direct impacts cannot be determine until an intensive survey is completed.

3. RECREATION AND ESTHETICS

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 also would increase, even with increased law enforcement.

The ranching-natural landscape character would unavoidably 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 due to 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 of 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 that unestimated 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 will be lost on as much as 262 acres of land (table 1), of which would be rehabilitated after mining.

If left after mining, land occupied by transportation systems (about 25 acres) would 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 about 5 years--but perhaps as long as 10 years--after mining ceases.

The decreased wildlife population potential resulting from proposed mining activities would be short term. If new access routes remain after mining, human encroachment through the routes would continue to depress wildlife productivity over the long term.

Impacts from mining on transportation 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 reasonably permanent feature of the landscape. 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 or impact the opportunity for recreation on a short- or long-term basis. Opportunities to participate in the same activities as at present would still be available and could be enhanced by improved access. 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 activaties during the life of the mine. After mining and reclamation, only the paved access route and minor residuals of mining would remain. The presence of the road and residual 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.

The 20.6 million tons of coal (estimated) that would be removed from the Lower Sunnyside seam would be consumed as a nonrenewable resource. Unmined coal, estimated at 27.4 million tons, would remain in place as pillars, fire walls, and other roof-supporting structures. This amount and an unestimated amount of coal that cannot be recovered from the Upper Sunnyside seam will remain as irretrievable resources unless and until suitable recovery methods can be developed.

Eroded soilwand lost soil productivity would be irretrievable.

Changes in ground-water flow patterns resulting from mining and subsequent subsidence would be irreversible.

Termination of coal mining operations would lead to a termination of pollutant emissions. Emissions from secondary growth and its related activity such as traffic, urban fuel consumption, etc., induced by the proposed action would be more permanent in nature and result in a long-term commitment of the air resource 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 irretraevably lost.

Proper reclamation of the disturbed areas will prevent irreversible commitment of grazing and vegetal resouces.

Wildlife lost, including individuals and their progeny and wildlife habitat potential affected, would be irretrievable.

Wildlife habitat destroyed and mine and nonmine related access into the general area remaining after mining would be irreversible.

Use of materials in the road, railroad, and waterline would constitute an irretrievable commitment of resources, as would the use of energy in construction. Other materials would be salvageable.

Irreversible and irretrievable commitment of resources by transportation would consist of the energy and materials to move the coal and the energy and materials for worker commuting.

Employment is expected at 238-290, commuting an average of 7.1 miles one way over at least 25 years. Over 25 years, commuters would travel 12.9 million miles and consume half a million gallons of gasoline.

During commuting hours, more than 80 cars and light trucks per hour would be using the access road, not counting supply trucks.

Based on national data, train transport over 19 miles would require 10^9 Btu to transport 10^{12} Btu of coal.

Any cultural resources found 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 irreversible 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

Considered here are alternatives to developing the B Canyon property. Regionally applicable technical and energy-source alternatives are described in part 1, chapter VIII.

A. NO ACTION

Pursuant to implied covenants of both the Federal mineral leasing laws and the existing lease agreements, the Secretary is obligated to respond to a legitimate application to conduct mining operations on a valid lease, provided that all terms and conditions thereunder have been met. His response may be approval as proposed, rejection on various legitamate grounds, approval in part and rejection in part, or approval subject to such additional conditions and requirements or modifications as he may impose under the laws. He may also defer decision, based on proper grounds, as described elsewhere in this chapter.

"No action" on proposals for continuation of approved ongoing mining operations would equate to closing down existing operations; under existing regulations, operations may not proceed in the absence of approved mining plans and related permits. The impacts of taking no actions in such cases would be approximately the same as those described under the following subsection C (2), "Cancel the leases."

"No action" on mining proposals for the initial development of existing leases would equate to maintaining the status quo on those leases. The impacts of taking no action in these cases would be the same as described subsequently under subsection C, "Prevent further development on existifg leases."

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 for 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. There could be significant mobility gut of the area, leaving approximately 10 percent of the permanent homes vacated.

B. DEFER ACTION

For proper cause, the Secretary may defer final action on a proposed mining and reclamation plan. These could include, but are not limited to, the need and time required for:

1. Modification of the proposal to correct administrative or technologic deficiencies.

2. Redesign to reduce or avoid environmental impact.

3. Acquisitions of additional data to provide an improved basis for technical or environmental evaluation.

4. Further evaluation of the proposal and (or) alternatives.

The principal effect of deferring action on a proposed mining and reclamation plan on these grounds would be a comparatively short-term delay in the imposition of all related impacts of the proposal as previously described in the unavoidable adverse impacts section of this statement.

Once a mining and reclamation plan is approved, the regulations and lease terms require that all subsequently proposed departures and deviations therefrom be approved in advance by the USGS. The regulations (30 CFR 211) also permit the USGS to direct that changes be made in previously approved operations. For example, changes could be ordered to accommodate new, improved, or revised administrative requirements, technologic improvements, environmental concerns or requirements, or revisions of prior evaluations thereof in the light of experience or previously unknown factors.

C. PREVENT FURTHER DEVELOPMENT ON EXISTING LEASES

The only alternatives to allowing development of existing leases is to prevent such development or to impose additional conditions and restrictions on the operations. The several apparent means of preventing full development are discussed below.

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, other comparable quantities of coal or sources of energy would be required to meet national needs. The development of other sources and related impacts is discussed later.

1. 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, and future suspensions of operations for reasonable periods, with proper grounds, could be imposed. The Secretary cannot, under present circumstances, suspend operations to the extent that a de facto 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 operations pending legislation remains available. Impacts of this alternative would be similar to those described in subsection C (2), "Cancel the leases."

2. CANCEL THE LEASES (NO NEW DEVELOPMENT)

The Secretary does not possess authority to unilaterally cancel the leases except on the ground defined therein (section 7 or 8 of the lease terms--"Proceedings in case of default"). The authority to cancel on other grounds would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees as may be necessary. The Administration has not entered a request for such legislation, and the Congress has not initiated such action in 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 non-environmental concerns.

Present production could be interrupted temporarily or terminated completely, as could further development of all existing leases.

To the extent that coal production from existing leases was curtailed or halted, alternative sources of energy would be required to meet present needs and demands. These could be foreign and (or) domestic and are discussed in later pages. The time required to replace the resource foregone could range from scant to a number of years, depending on the specific alternative(s) selected and its state of production.

Environmental impacts of the proposals could range widely, depending on the administrative action taken on existing leases. If these leases were cancelled through Congressional authorization, proposed mines would be avoided. Conversely, should development eventually be authorized, environmental impacts as discussed in the impact chapter would occur. The net result would be a deferral and perhaps reduction of impacts through changed technology or requirements imposed at that time.

3. FEDERAL ACQUISITION OF LEASES

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 under subsection C (2).

4. REJECT THE MINING AND RECLAMATION PLANS

Rejection of the proposed mining and reclamation plans would result in no environmental impact on the leased lands, and they would continue in their present condition, subject to modification by natural process and by the condition of other existing activity and uses--and to further modification by the surface owner to meet other uses.

The Secretary may reject any individual proposed activity 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 designed course of action by the lessee (operator). 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 Congress. Viability of this option is dependent upon timely legislative action; the option of rejecting the proposed plans pending legislation remains available. Impacts of this alternative would be similar to those described under subsection C (2), "Cancel the leases."

D. RESTRICT DEVELOPMENT ON EXISTING LEASES

The subject leases convey the right to develop, produce, and market the Federal coal resource thereof if all other terms and conditions have been met by the lessee. In general, the Secretary does not possess the authority to arbitrarily constrict development. 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.

Thus, under present conditions, a general effort to restrict or regulate development of existing leases 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 decisaon, as it relates to impacts, possible litigation, and the need for authorizing legislation, would be relevant in this instance.

E. APPROVE THE MINING PLAN AFTER MODIFICATION

A number of the impacts identified and described in chapter III of this statement could be more fully mitigated by the selective application of those measures described that are supplemental to the proposals of U.S. Steel Corp. or by implementation of one or more of the alternatives described below. In addition, special conditions could be added to the approved plans relating to the secondary effects of the mining. Such conditions must be reasonable and, if unacceptable to the lessee, could result in the lessee not developing the lease areas with the resultant impacts previously discussed under subsection C (4) "Reject the mining and reclamation plans."

Mitigations that are not mandatory but that would enhance the mining and reclamation plan include:

1. A 1.5-acre topsoil storage area was proposed in the miningwplan (fig. 4). Most of the topsoil at the facilities site is very cobbly, however, and of relatively poor quality. Rather than storing all topsoil, poorer soils could be used as fill, where needed, and reused later during reclamation. Only where the soil can logically be retrieved should it be used for fill. Less disturbance of the land and more efficient use of surface materials would result. Some better topsoil is present, especially in sagebrush openings. This soil should be stockpiled or used for reclamation concurrent with construction, where applicable.

2. In some places, where cut slopes blend into the landscape and do not conflict with other planned uses, it is more desirable to leave a gentler configuration than a steep slope. The land may thus be rendered more useable, and soil erosion woudd also be reduced.

3. Supplemental irrigation should be provided, if necessary, during reclamation because of scant and unpredicatable precipitation. If plant-growth response so indicates, the soil should be fertilized as long as necessary after seeding to maintain permanent vegetation.

4. The railroad right-of-way should not be fenced, which would allow livestock and big game easy movement across the tracks and use of feed in the right-of-way. As only one train per day is planned, the potential for collisions with animals should be minimal.

5. Either potential change in railroad location (fig. 8) would change impacts on vegetation and grazing only to a minor extent. Grouped rights-of-way could reduce the total area of disturbance, but they would widen livestock crossings. Other impacts and uses would be similar to

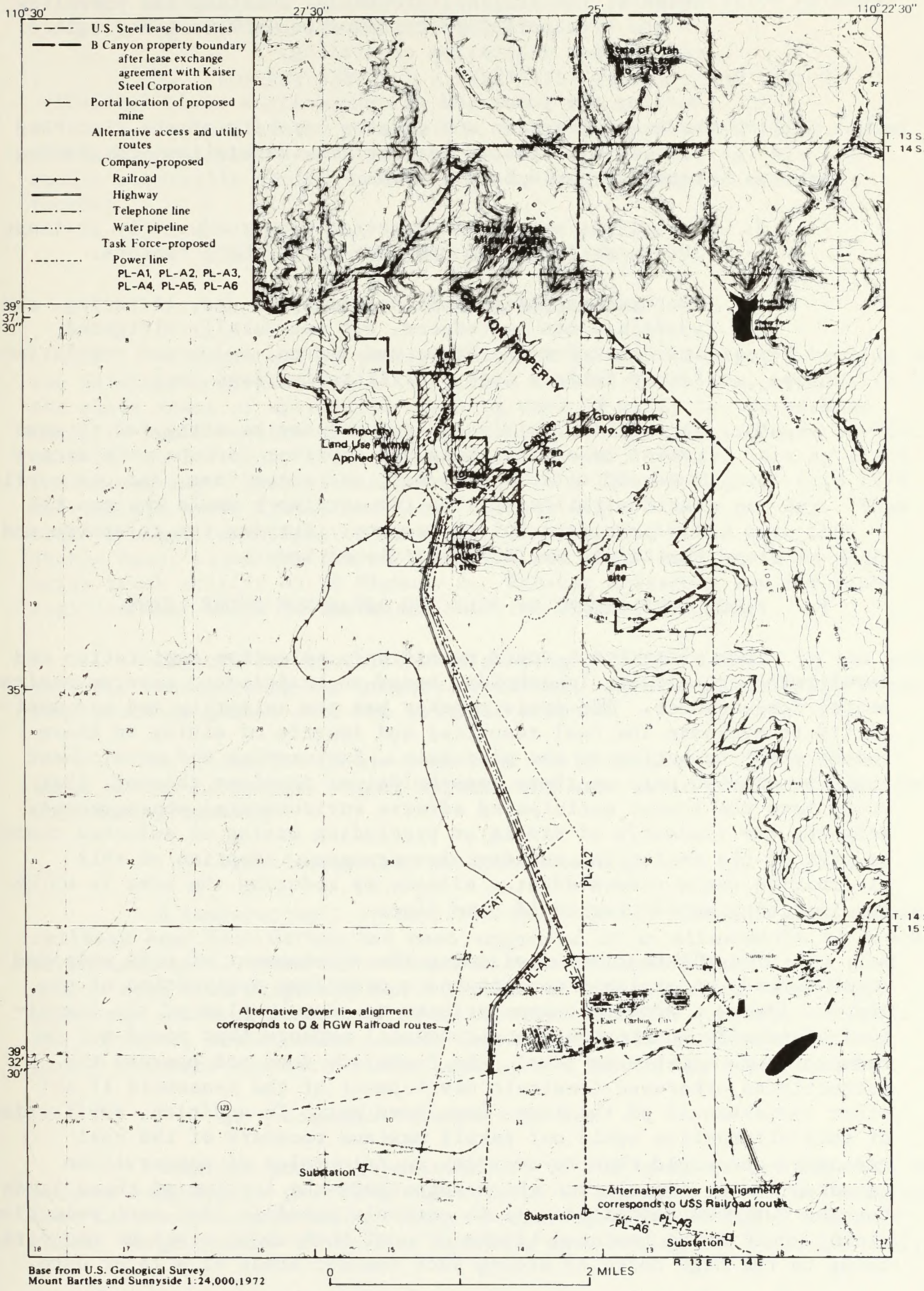


Figure 8.--Map showing alternate access and utility routes.

those of the original proposal. Locating the powerline in the transportation corridor would have a negligible effect upon vegetation or grazing.

6. Burying the power and telephone lines would initially reduce vegetation and grazing capacity of the disturbed area. After proper reclamation, vegetation and grazing capacity would be restored.

7. Powerlines should be separated from roadways by at least 300 yards to reduce shooting of perching raptors.

8. Impacts resulting from increased ORV use, littering, and vandalasm can be reduced, but not totally mitigated through enforcing State and Federal rules and regulation (State Vehicle Code, antilittering laws, etc.).

9. Impacts to the visual resource can be mitigated to some extent by establishing one corridor for the main access road and telephone, power, and waterlines, and one corridor for the railroad. The two corridors would replace the five proposed by the company. Burying the telephone and waterlines would reduce visual impact.

F. ALLOW DEVELOPMENT OF SELECTED AREAS NOW UNDER LEASE

This alternative would permit only selective exploration and development on existing leaseholds, based on anticipated adverse environmental consequences. The decisionmaker has the authority and responsibility to evaluate the coal resources and impacts of mining on these leases prior to acting on the proposals. Exploration and development could be allowed only on these leaseholds, or portions thereof, that would have the lowest anticipated adverse environmental consequences. Weighing the tradeoffs of mining or precluding mining on selected tracts is part of the evaluation and decision process. Adoption of this alternative would reduce adverse effects by reducing the area in which the impacting activities could take place.

The alternative of allowing the development of only selected areas already under lease constitutes a selective application of the above. Absent a showing lease-by-lease or plan-by-plan of the likelihood of totally unacceptable environmental impacts that could not be reduced to an acceptable level, the Secretary does not possess the authority to otherwise constrain development of the leasehold if all other requirements of the lease have been met. In addition, application of this alternative wguld not permit maximum recovery of the coal resources and would then 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.

G. ALTERNATIVE LOCATION OF FACILITIES, TRANSPORTATION METHODS AND ROUTES, AND UTILITY ROUTES

1. COMPANY-PROPOSED ALTERNATIVES (table 2 and fig. 8)

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

2. TASK FORCE-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.

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,

Table 2.--Summary company-proposed alternative transportation and utility routes (see fig. 8)

	Right-of-way			
	Miles	Width	ROW (acres)	Surface disturbance (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

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.

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 on figures 2 and 8. Three Task Force-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 on 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., wherewit 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 3.--Length and acreage of primary and alternate proposed utility routes, B Canyon mine, Carbon County, Utah

	Length miles	ROW acreage required Federal	State	Private	Total acres
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.

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 R/W needed	6.32	0	[1]-0.11	6.20	19.2	[1]-0.8	[1]- 0.3	18.0
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 R/W 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

Bureau of Land Management; Geological Survey; USDA Forest Service; Fish and Wildlife Service; Soil Conservation Service and National Weather Service.

B. UTAH STATE AGENCIES

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

Southeastern Association of Governments

D. PRIVATE INDIVIDUALS AND ORGANIZATIONS, INDUSTRY AND NONINDUSTRY

United States Steel Corporation
Vaughan Hansen Associates

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.

Hinckley, D. K., 1970, A progress report on attempts to locate black-footed ferrets, Mustella nigripes, in Utah: Div. 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, Anc., 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:w 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 and O'Connor Mines

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

Proponent: Valley Camp of Utah, Inc.

Site Specific Statement

Valley Camp of Utah, Inc.

Belina No. 2 and O'Connor Mines

CONTENTS

ILLUSTRATIONS

TABLES

VALLEY CAMP OF UTAH, INC.

BELINA NO. 2 AND O'CONNOR MINES

CHAPTER I: DESCRIPTION OF PROPOSED ACTION

A. INTRODUCTION

Valley Camp of Utah, Inc., submitted plans in 1976 for approval to mine 2.4 million tons of coal per year (mty) from two proposed underground mines on the same Federal leasehold (all or parts of Federal lease Nos. U-017354, U-067498, U-073120, U-020305, and U-044076) within the Manti-La Sal National Forest. The entire mining area covers 2,740 acres of Federal, private, and Carbon County lands (table 1). The purpose of this statement is to analyze environmental impacts that could result from approval of these mining plans. Future modification of the plans may require additional impact.

Mining operations of the Belina No. 2 and O'Connor mines would be integrated with the company's existing Belina No. 1 mine on the same leasehold. Environmental impacts have been assessed and Federal approval granted in February 1977 to mine coal from the Belina No. 1 mine.

The company also has submitted preliminary plans for transportation, utilities and other facilities that will be needed to implement the mining plans (table 1). These are all on private land except for 0.1 mile of road in Boardinghouse Canyon.

B. PROPOSED ACTION

The proposed mines are located about 20 miles NW of Price and 4 miles SW of Scofield, Utah (fig. 1). Main access to the mines would be in Whisky Gulch, a side canyon off Eccles Canyon, and Boardinghouse Canyon. There also would be a personnel entry in Finn Canyon (fig. 2).

There are three known commercial coal beds on the leasehold, the Upper and Lower O'Connor beds and the McKinnon bed. Regional faulting has separated the beds into three mining areas. These areas are the Connelville block between the Connelville and O'Connor faults, the area west of the Connelville fault, and the area east of the O'Connor fault (fig. 2). Lease exchanges between Valley Camp of Utah, Inc. and Routt County Development Ltd. (McKinnon No. 1 and 2 mines described elsewhere in this document) have been negotiated to more efficiently recover the coal across the Connelville fault (fig. 3). Mining plans provide for mining the upper beds before lower bed recovery. Mining techniques are proposed that could result in maximum recovery of the coal resource in the thicker portions of the beds of the Belina No. 2 and O'Connor mines.

The minability of a fourth underlying bed, the Flat Canyon bed, has not been determined.

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

Area included in mining plans (acres)		
Federal lease area	2,087	
Routt County Development, Ltd. Federal lease exchange	203	
Carbon County lease	240	
Sublease of part Routt Development, Ltd. Carbon County lease	50	
Private coal land	160	
Total	2,740	
Product	Steam coal (high volatile bituminous)	
Market	Unidentified (probably electric power)	
Coal resource, estimated reserves, in million tons	Belina No. 2	O'Connor
In place	52	27
Recoverable	26	13
Expected mine life, in years	25	10
Production rate, million tons per year	1	1.4
Schedule		
Months until initial production	3	20
Months until full production	12	32

Ancillary facilities

Belina No. 2--(a) Belina No. 1 development has created needed roads and powerlines.
(b) Belina No. 1 mine 2.5-mile conveyor belt to rail loadout facility not yet constructed.
(c) Belina No. 1 rail loadout facility not yet constructed.

O'Connor------(a) Upgrade 2 1/2 miles Boardinghouse Canyon road (24-foot roadway, graveled surface).[1]
(b) Upgrade 2 1/2 miles Finn Canyon road for personnel access. Build 1/2 mile road to portal area.[1]
(c) 1.4 miles O'Connor to Belina No. 2 conveyor.
(d) 0.6 mile powerline.

Land surface disturbance (acres)[1]	Belina No. 2[2]	O'Connor[3]
Portal facilities	None	10.6
Conveyor	None	5.6
Access	None	5.0
Powerline	None	1.2
Yearly resource requirements		
Water first 10 years, acre-feet	400	600
Water next 15 years, acre-feet	400	0
Yearly personnel requirements[4]		
Construction, workers	50	50
First 10 years, workers	290	405
Next 10 years, workers	290	0

[1]All private land except 0.1 mile of road in Boardinghouse Canyon.
[2]No new disturbance area prepared in Belina No. 1 mine facilities site construction.
[3]Mine operated at this site 1956-67. Only new disturbance listed.
[4]Based on 15 tons per manshift (includes support).

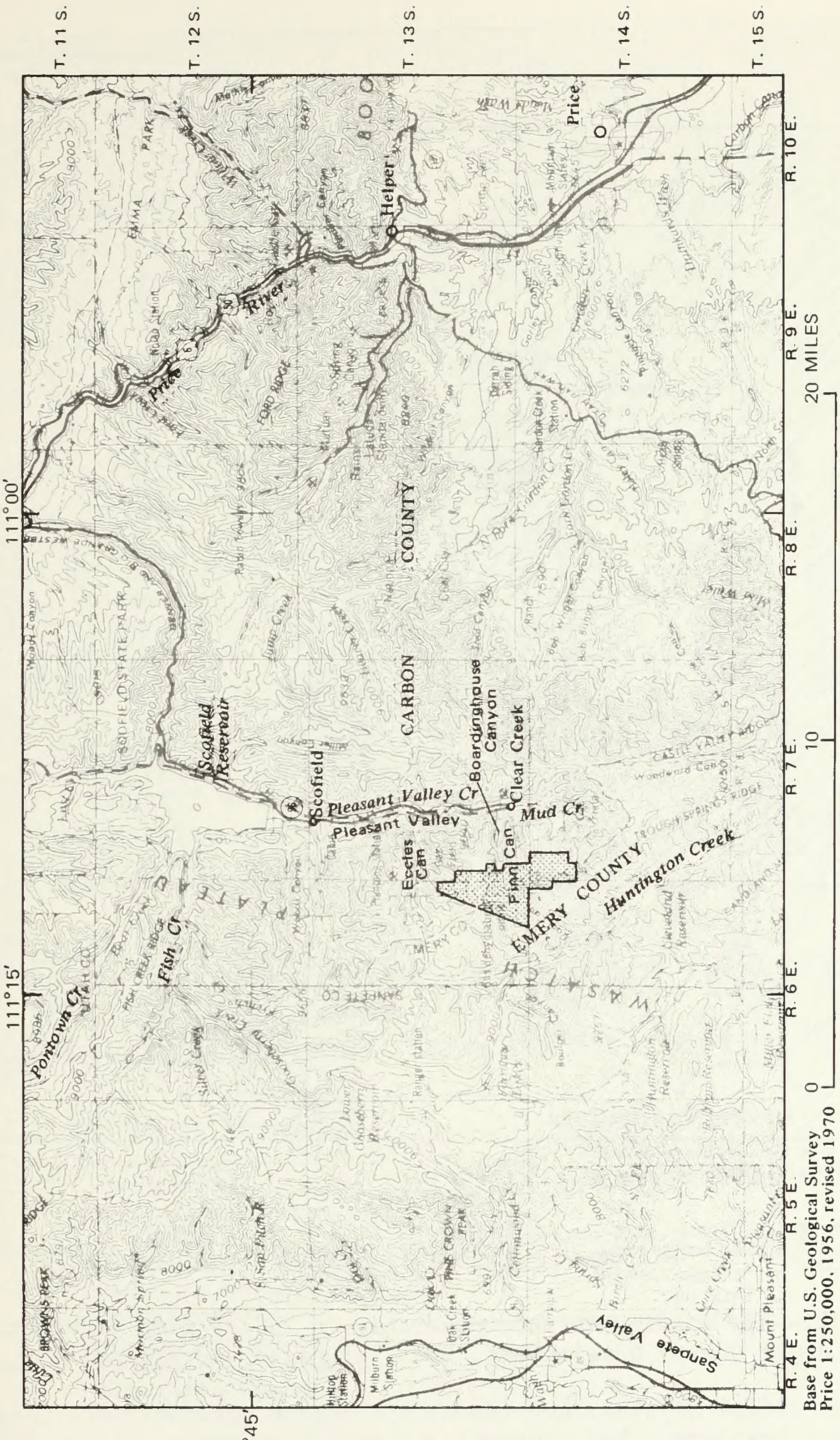


Figure 1.--Index map showing Valley Camp of Utah, Inc., properties, Carbon and Emery Counties, Utah.

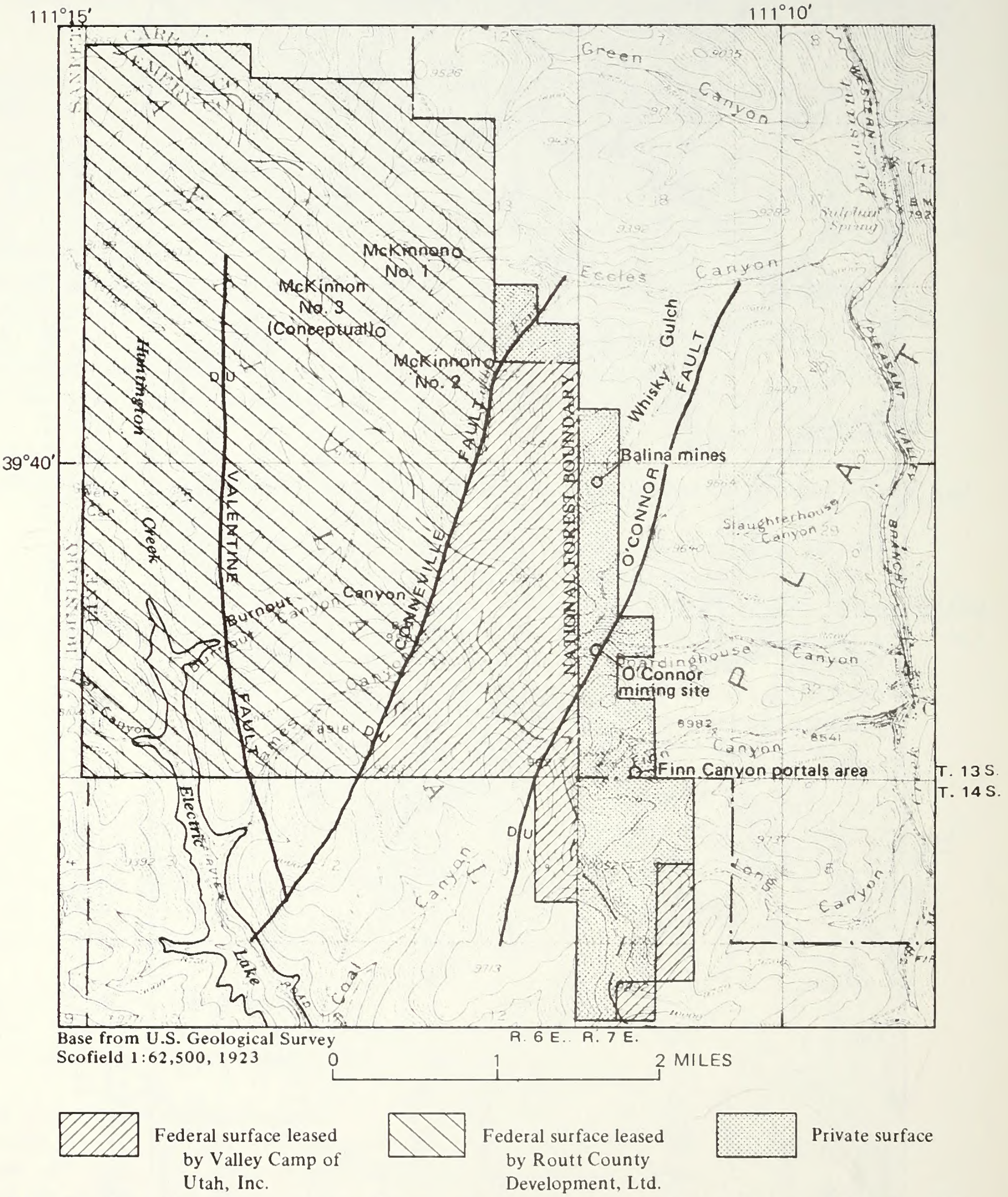


Figure 2.--Map showing surface ownership in Valley Camp of Utah, Inc., and Routt County Development, Ltd., proposed operations.

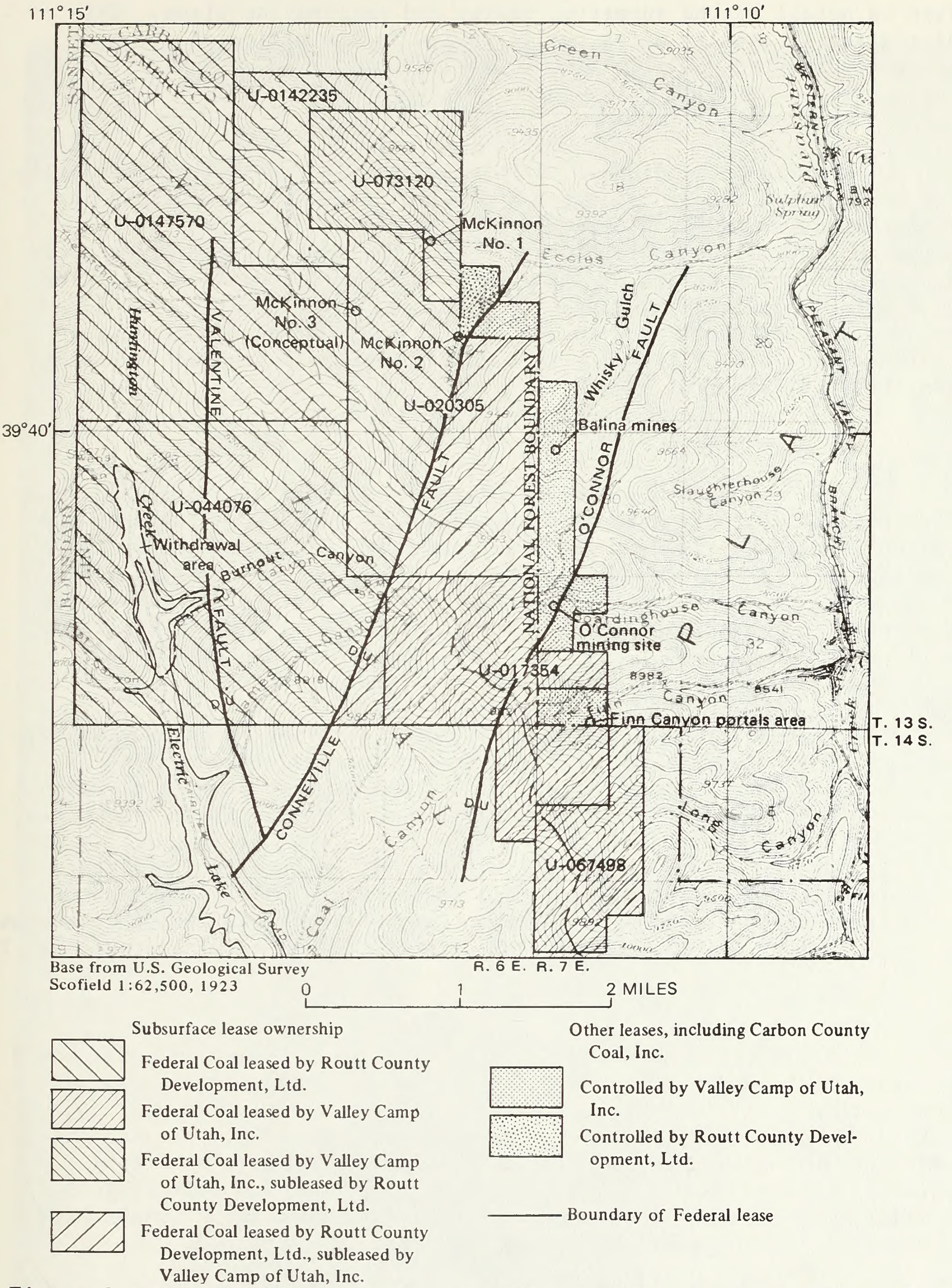


Figure 3.--Map showing subsurface (coal) ownership in Valley Camp of Utah, Inc., and Routt County Development, Ltd., proposed operations.

The mine development plan and projected mining sequence is given in detail in the submitted mining and reclamation plans. This information is available for public review in the office of the Area Mining Supervisor, USGS, Salt Lake City, Utah.

Belina No. 2 mine

The company plans to extract 1.0 million tons of coal annually from the Upper O'Connor bed through the Belina No. 1 mine portals on private land in Whisky Gulch. The proposed Belina No. 2 mine would recover coal from the Lower O'Connor bed. The mine entries are on private land adjacent to and in the area of surface disturbance of Belina No. 1, also on private land (fig. 4). Except for a 7-entry portal, the same surface facilities constructed for Belina No. 1 mine will be used in mining from Belina No. 2 (fig. 5). The McKinnon bed is absent from the initial mining area.

O'Connor mine

The proposed O'Connor mine is located in Boardinghouse Canyon on private land at the site of previous mining (fig. 6). The proposed mine would remove coal from the Upper and Lower O'Connor beds on the east side of the O'Connor fault. It would also recover coal from the McKinnon bed on the west side of the O'Connor fault. The McKinnon bed is missing in the area of initial mining of the Belina mines (fig. 7). No plans have been submitted to mine the McKinnon bed east of the O'Connor fault in those areas where it is present.

Initially a 5-entry portal system, settling ponds, warehouse, parking area, bathhouse, drain field and power substation will be needed at the plant site (fig. 8). This will require 2 acres of new surface disturbance. All of these facilities are on private land.

As mining progresses south and east, an auxiliary plantsite and portal for personnel access would be opened in the Upper O'Connor bed in Finn Canyon (fig. 9). The Finn Canyon site would include personnel and ventilation portals, bathhouse, drain field, and parking area (fig. 10).

O'Connor to Belina conveyor

Until the O'Connor mine approaches full production, coal would be hauled by trucks on the Boardinghouse Canyon access road. The company then plans to install 1.4 miles of conveyor to transport coal from the O'Connor mine to the Belina minesite. Here it will join the estimated 2.5-mile conveyor belt to be installed to move coal from Belina No. 1 down Whisky Gulch and Eccles Canyon to the rail loadout facility (fig. 15). The entire conveyor system from the O'Connor mine to the rail loadout would be on private land.

Figure 4.--Photograph showing Belina No. 1 portals and other surface facilities in Whiskey Gulch, Carbon County, Utah. Foreground is Conifer-Aspen type vegetation and background is Aspen type.

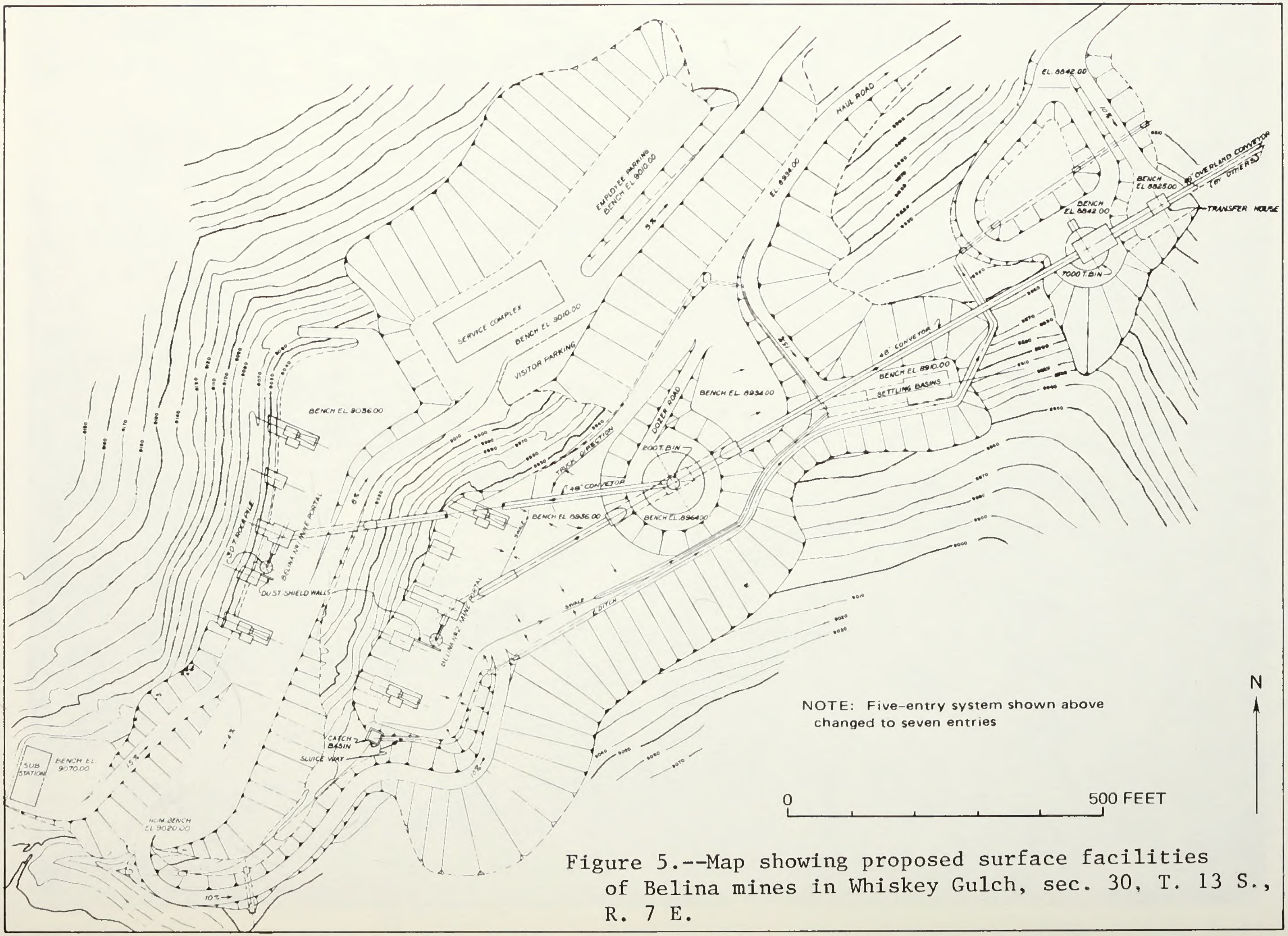


Figure 5.--Map showing proposed surface facilities of Belina mines in Whiskey Gulch, sec. 30, T. 13 S., R. 7 E.

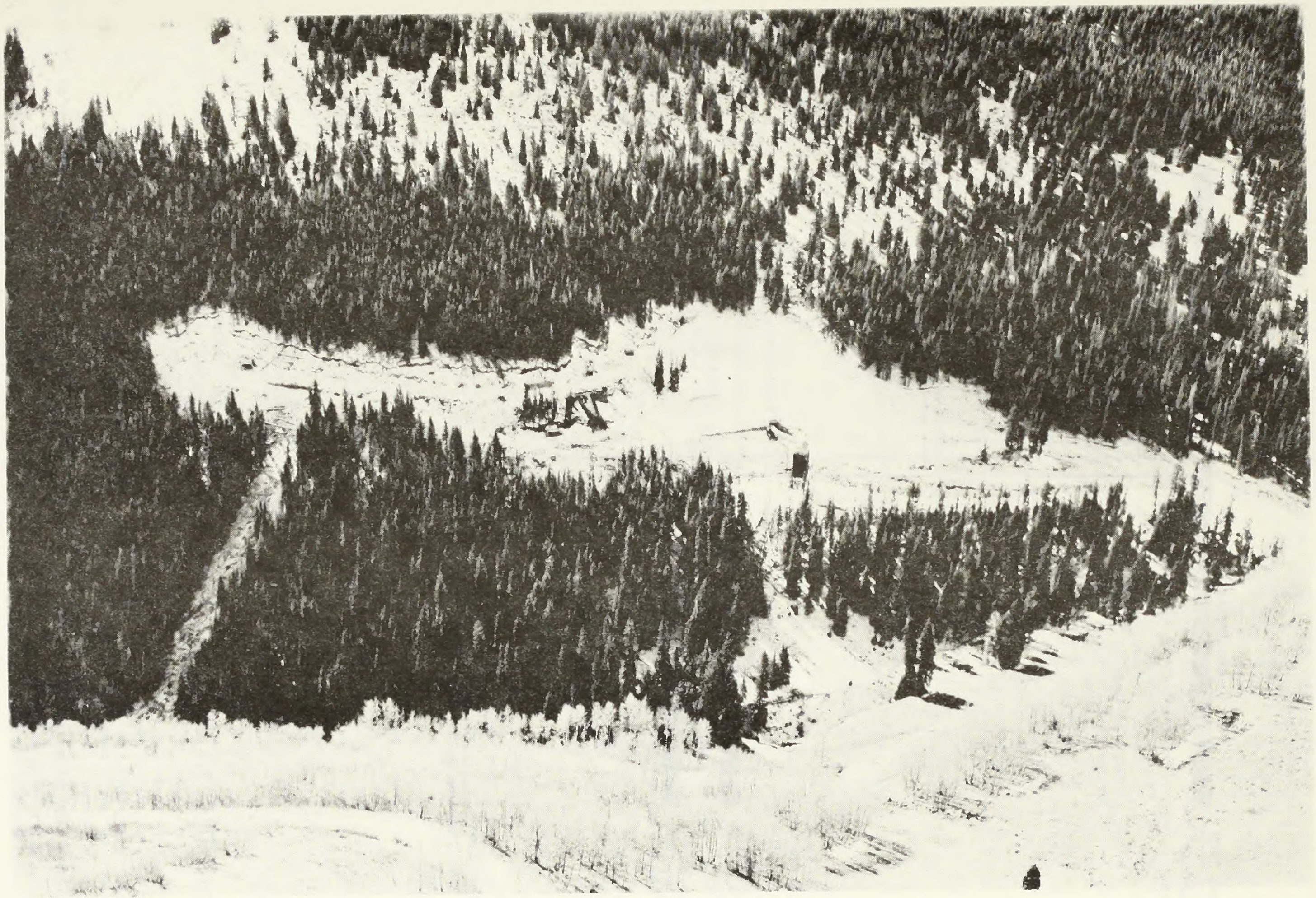


Figure 6.--Photograph showing O'Connor minesite in Boardinghouse Canyon, Carbon County, Utah. Foreground is Aspen type vegetation and background is Conifer-Aspen type.

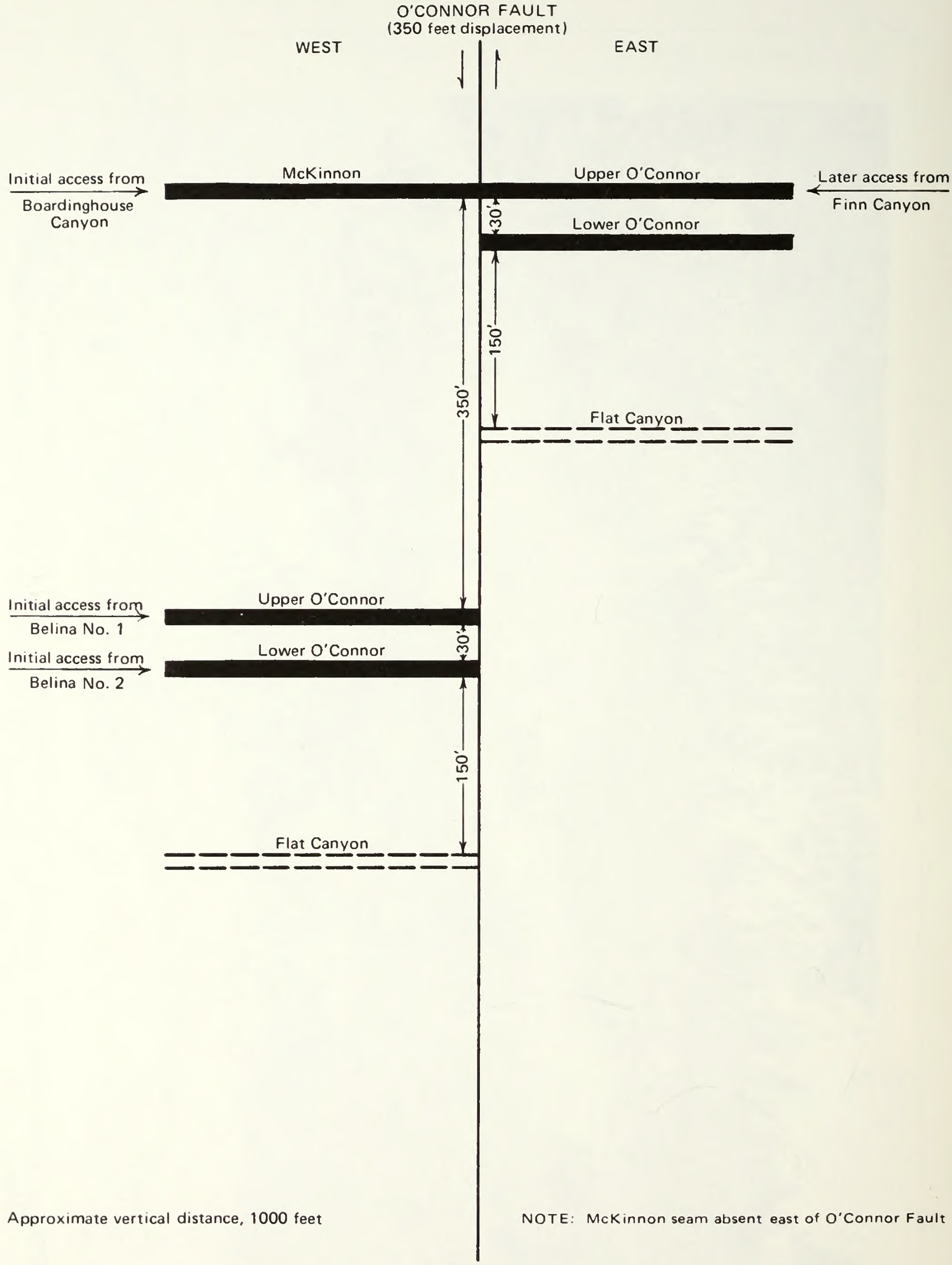


Figure 7.--Cross section of coal beds and O'Connor fault at O'Connor mine, sec. 36, T. 13 S., R. 7 E.

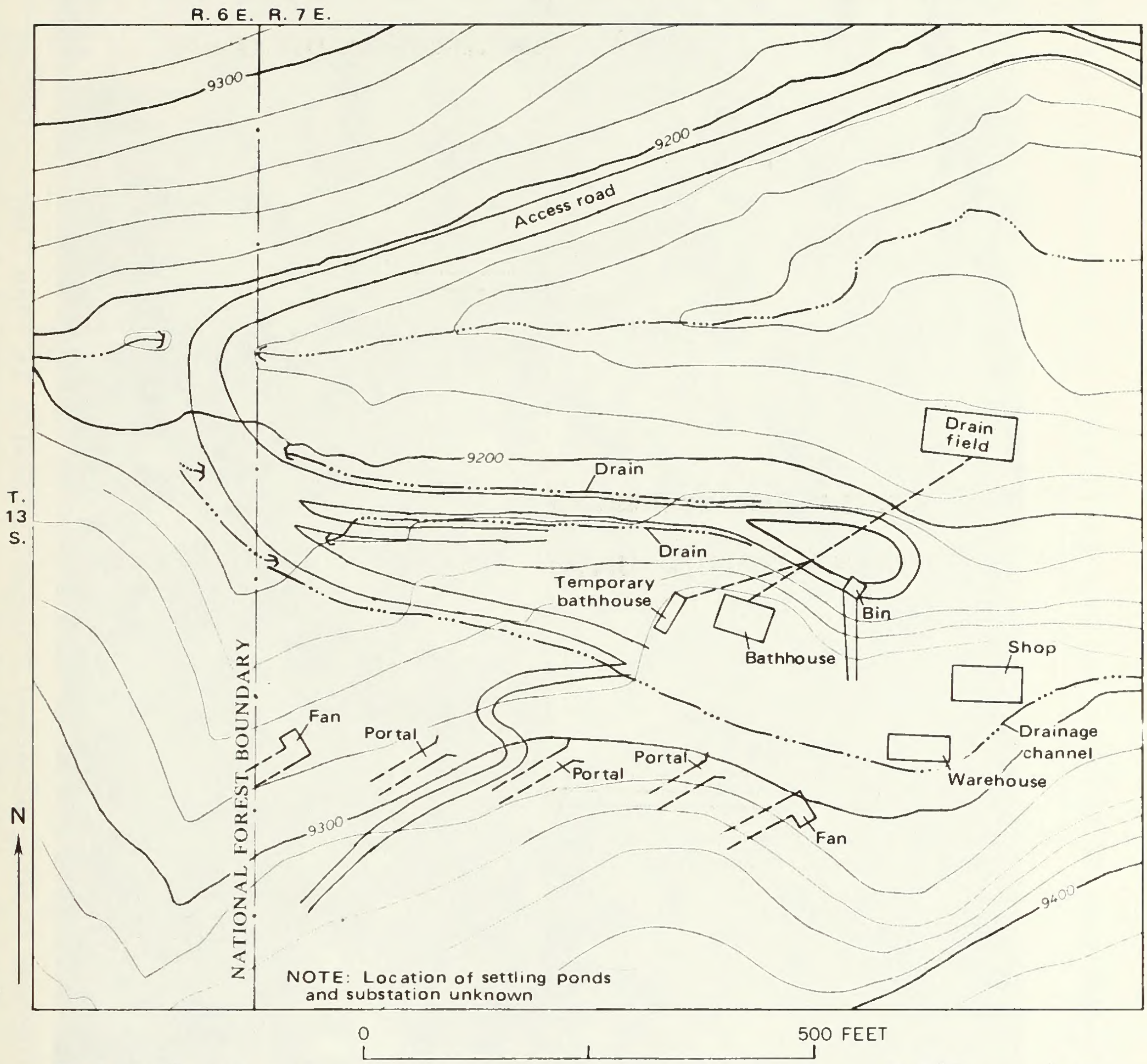


Figure 8.--Map showing proposed surface facilities of O'Connor mine in Boardinghouse Canyon.

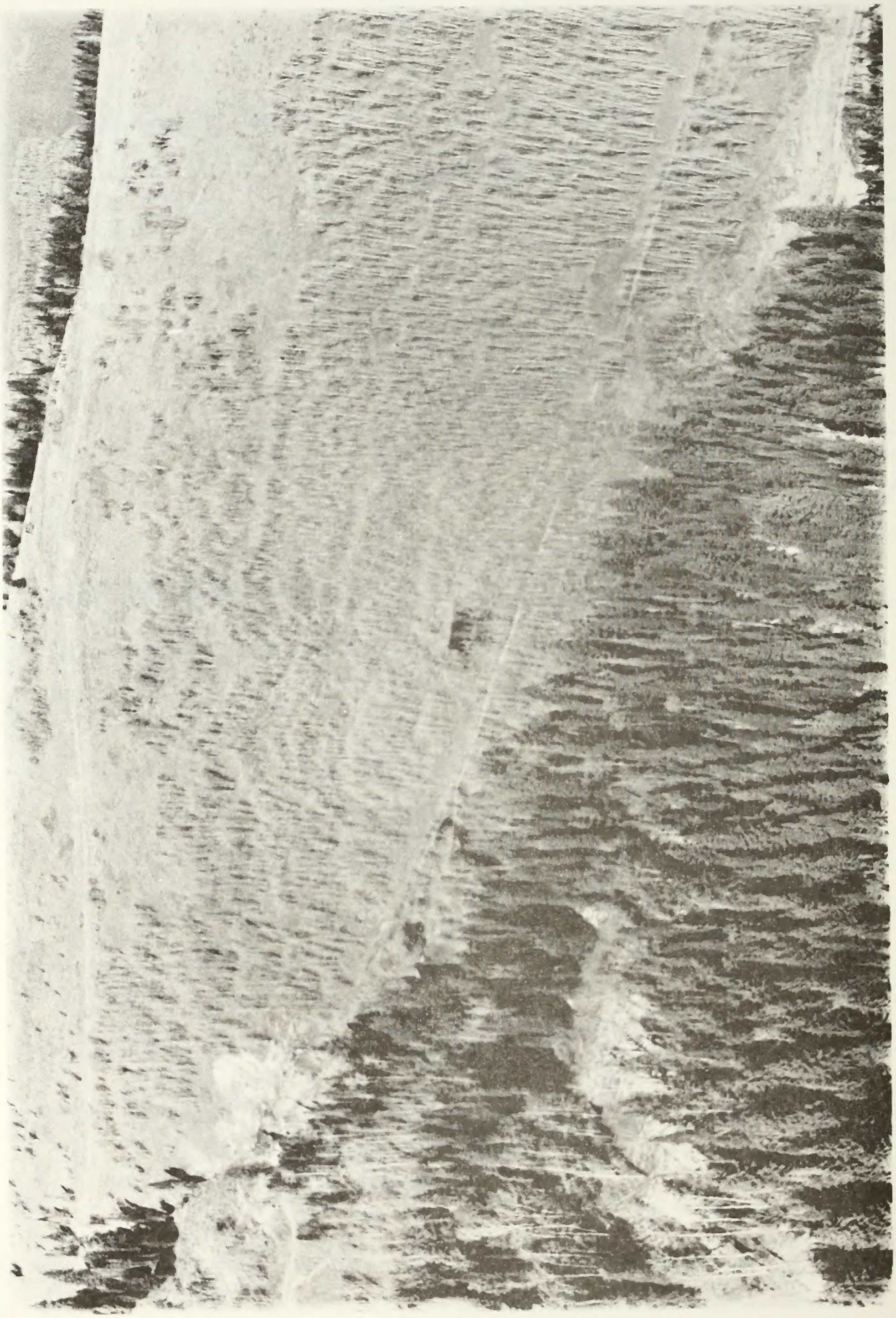


Figure 9.--Photograph showing proposed O'Connor minesite in Finn Canyon, Carbon County, Utah. Foreground is Conifer-Aspen type vegetation and background is Aspen type.

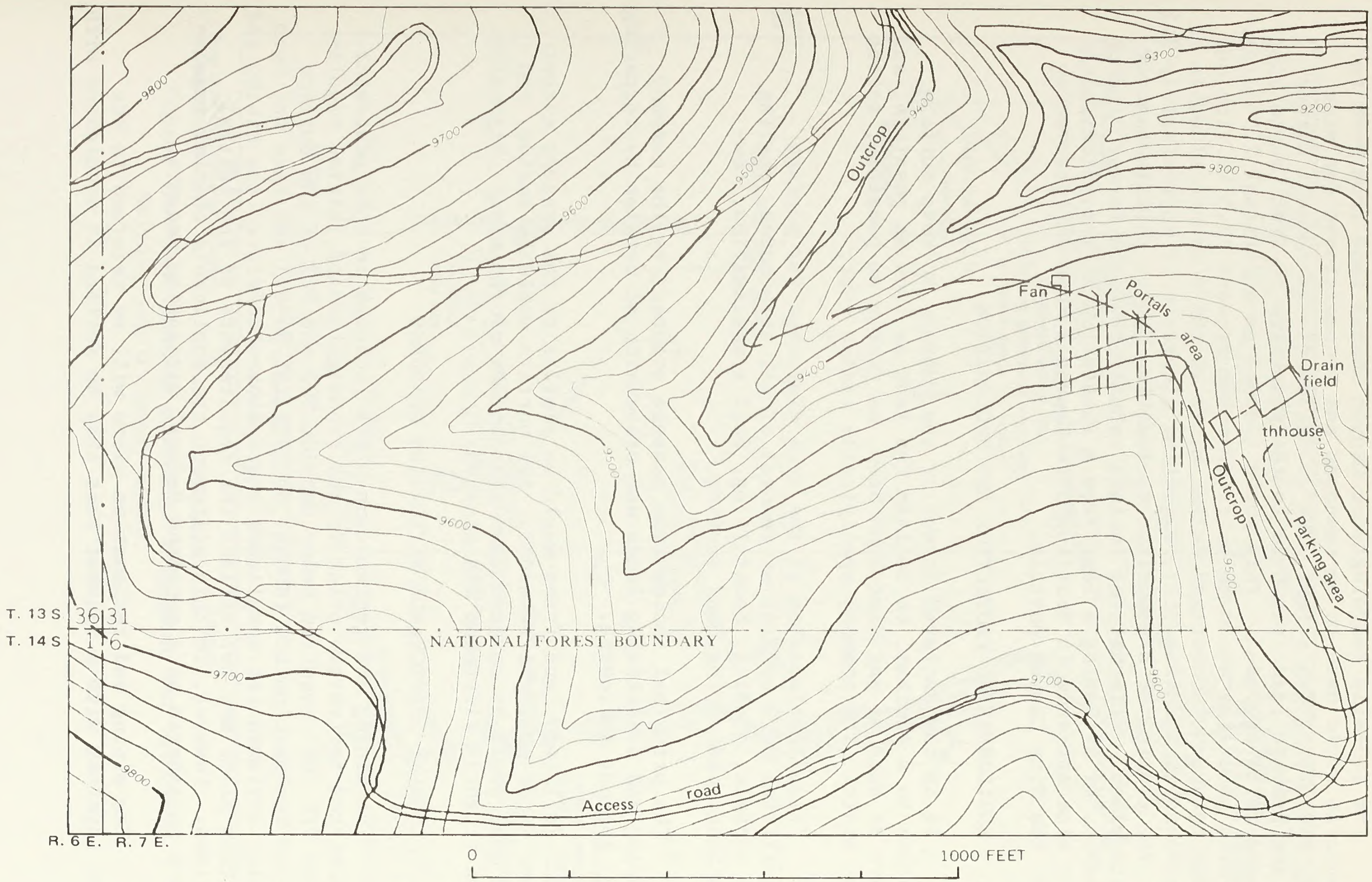


Figure 10.--Map showing proposed surface facilities of O'Connor mine in Finn Canyon.

Associated actions

The 2.5-mile Boardinghouse Canyon access road from U-96 to the plantsite would have to be reshaped and reconditioned for mine traffic, disturbing 2.5 acres. The 2.5 miles of the present Carbon County and private road from U-96 to the plantsite in Finn Canyon also would need to be upgraded. This would disturb an additional 2.5 acres. An 0.6-mile powerline would be built from the present 12.5 kV line on the ridge between O'Connor and Belina mines to the O'Connor minesite in Boardinghouse Canyon (fig. 11), requiring clearance of approximately 1.2 acres. The routing of a powerline to the Finn Canyon portals has not been determined. Alternatives include rehabilitating a former line up Finn Canyon, or extending a line from a substation at the principal O'Connor mine entrance in Boardinghouse Canyon across an intervening ridge to the Finn Canyon portals.

C. ENVIRONMENTAL PROTECTION AND RECLAMATION

It is the declared intent of the company to keep surface disturbance to a minimum, to reclaim the land as soon as possible, and to return as much of any disturbed area, as nearly as possible, to the original state. The company specifically states that:

> "Final reclamation of the area disturbed for surface facilities will consist of removal of all structures, sealing of portals, grading, backfilling, soil stabilization, compacting, contouring, and seeding."

The principal reclamation measure proposed by the company are shaping and stabilizing lands and prevention of erosion by terracing and (or) contour furrowing.

Reclaimed land forms would be similar to the present except that some roads would be retained. All portals would be sealed, and exposed coal would be covered upon abandonment of the mine. Highwalls would be slightly flattened and planted.

D. LEGALLY ENFORCEABLE MITIGATION MEASURES

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 and Reclamation Act (SMCRA) of 1977 (PL 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, in this statement the applicable initial regulations are considered as a required Federal mitigating measure.

The mining and reclamation plans will be returned to the operator together with a request that they be revised in accordance with

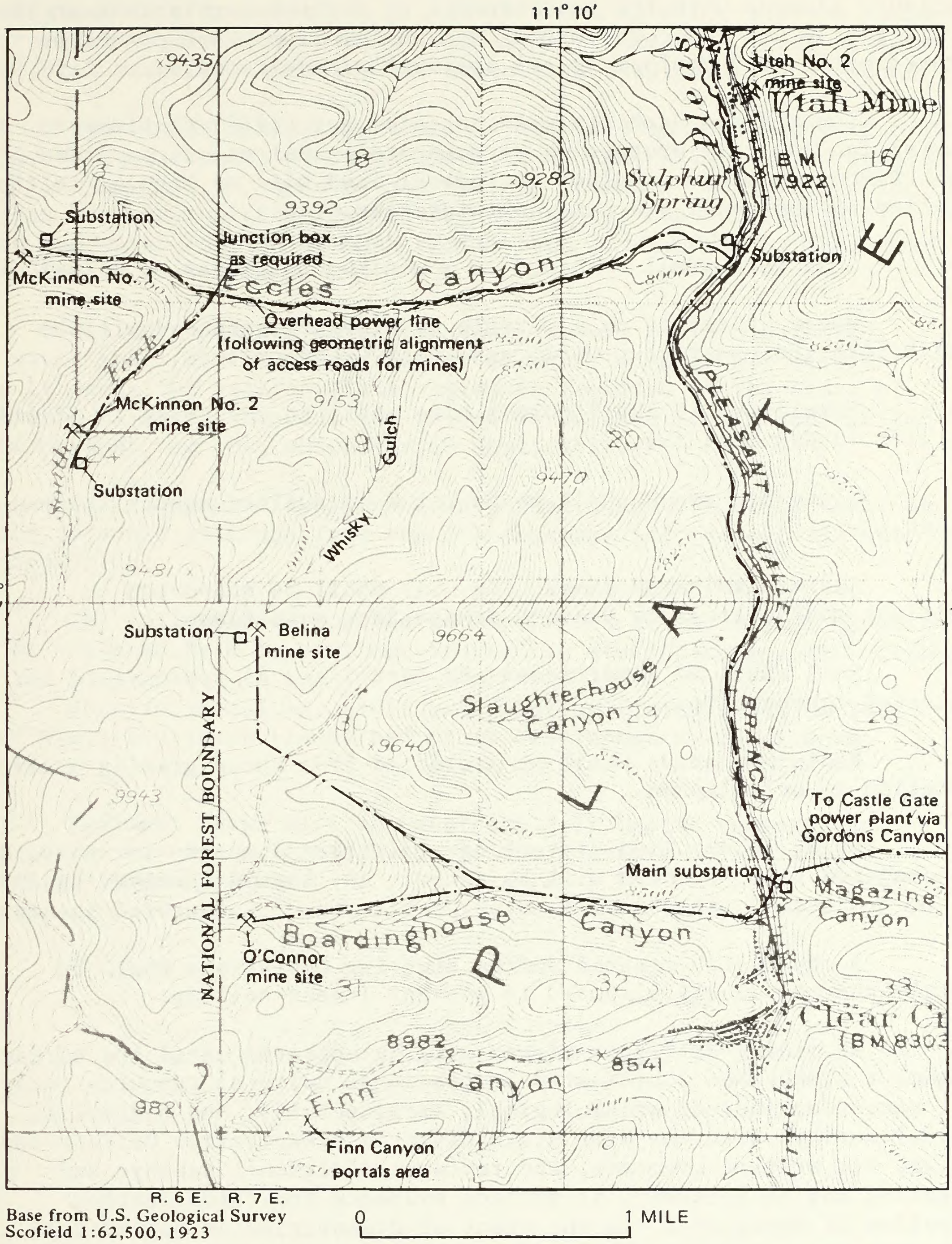


Figure 11.--Map showing powerline alignment for McKinnon, Belina, and O'Connor mines.

the applicable initial regulations. As soon as the mining and reclamation plans are revised and returned to the U.S. Geological Survey (GS) they will be evaluated with the Office of Surface Mining to determine compliance pliance with the requirements of Federal regulations at 30 CFR 211 and 30 CFR 700. The mining and reclamation plans cannot be approved until they conform to all applicable requirements.

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 local BLM land administering office.

Coal beds shall be mined to a minimum thickness of 4 feet.

Where it exists as a minable bed the McKinnon bed will be mined before the underlying Upper and Lower O'Connor beds.

Subsidence at the O'Connor mine shall be monitored in accordance with 43 CFR part 211.

Disturbed areas shall be restored to surface agency recommendations.

Gas transmission lines (fig. 14) shall be supported by sufficient coal pillars to prevent damage from subsidence.

Soil shall be conditioned and fertilized as appropriate for successful revegetation.

Reclaimed areas shall be protected from sheep grazing until vegetation is established.

Prior to any land disturbing activities a survey for threatened or endangered plant species will be taken. Any listed species found will be protected. (See part I, chapter III, No. 7 Endangered Species.)

Woody debris created during clearing operations shall be promptly and completely disposed to prevent insect buildup.

No mining or rights-of-way will be approved until the surface management agency has coordinated professional cultural resource (cultural resources include archeological, architectural, and historical remains) surveys with the Utah State Historic Preservation Officer and received his written comments, and review. Additional surveys and mitigation may be necessary if surface evidence indicates further evaluation is necessary. In the event of discoveries of buried cultural resources as the result of exploration or mining activities the operator will notify the GS and the surface management agency immediately and suspend operations.

The authorizing office will comply with the basic 1906 Federal Antiquities Act (PL 59-209; 34 Stat. 225), the National Historical Preservation Act of 1966 (PL 89-665; 80 Stat. 915), the Historical and Archeological Data Preservation Act of 1974 (PL 93-291), and the subsequent Federal regulations which provide legal backing and instructions for cultural resource inventory and protective consideration of sites.

Hydrologic monitoring shall be required in accordance with 30 CFR 211, or requirements of state agencies or EPA, whichever is applicable. If the flow or yield of any spring, stream or well from which water has been appropriated is reduced by mining, the company shall replace the water in kind or make restitution as required by the State of Utah (title 73-3-23).

Wastes shall not be placed where waters will be polluted. Waste water shall not be discharged or allowed to enter any waters unless it meets the water-quality standards required by the State of Utah (title 73-14-1, et al.), the Office of Surface Mining Reclamation and Enforcement, or EPA, whichever is applicable.

Coal conveyors shall be covered and transfer points shall be enclosed to avoid spillage into the drainageways and protect against wind dispersion.

The collapsed corrugated metal culvert at the Belina minesite shall be replaced by a culvert constructed to avoid plugging or collapse.

Wherever feasible, undisturbed buffer strips shall be left between disturbed areas (roads and other developments) and stream channels.

Sediment traps will be constructed if onsite measures and buffer strips are not sufficient to prevent significant sediment delivery to stream systems.

CHAPTER II: DESCRIPTION OF EXISTING ENVIRONMENT

A. NATURAL ENVIRONMENT

1. CLIMATE

The general climate of the area is described in part 1. Average monthly temperatures at the proposed minesite range from 15° F in January to 60° F in July. Extreme temperatures are about -40° and 80° F. Average annual precipitation is 25-30 inches, including 8 inches of rainfall from May to September. Snow generally falls from October through May, and snow accumulation averages about 4 1/2 feet. Maximum snow accumulation expected is 8 feet.

2. LAND

a. Land Surface and Geology

The proposed mines would be located at the northern end of the Wasatch Plateau, which reaches elevations of 10,000 feet in the proposed mining area. The lease areas are characterized by rugged surfaces with slopes of 25 to 33 percent common.

The proposed mining area is underlain by the Star Point Sandstone, Blackhawk and Price River Formations of the Upper Cretaceous Mesa Verde Group. The Blackhawk Formation is the coal-bearing unit. Figure 12 shows a stratigraphic column at the proposed O'Connor minesite. Detailed descriptions of the formations are given in part 1.

The dominant structural feature of the mining area is the north-trending Clear Creek Anticline. The Anticline is cut by several faults in this area, the largest being the Pleasant Valley Fault, east of the mining area, which trends north-northeast.

The project area has not been surveyed for paleontological resources. Vertebrate and plant fossil-bearing areas are described in regional EIS, part 1, chapter II.

Due to the present lack of data and accepted evaluatory criteria for determination of significance, no meaningful assessment can be presently made as to the importance of these paleontological resources to science, education, or other values, hence to the significance of potential impacts on the fossil record.

The GS and BLM are currently developing a Memorandum of Understanding relating to the protection of paleontological resources on Federal lands. These agencies are also developing technical guidelines to define the resource, provide evaluatory criteria, and measures for protection. When finalized, the provisions of these documents will serve as a basis for management of paleontological resources and appropriate protective programs.

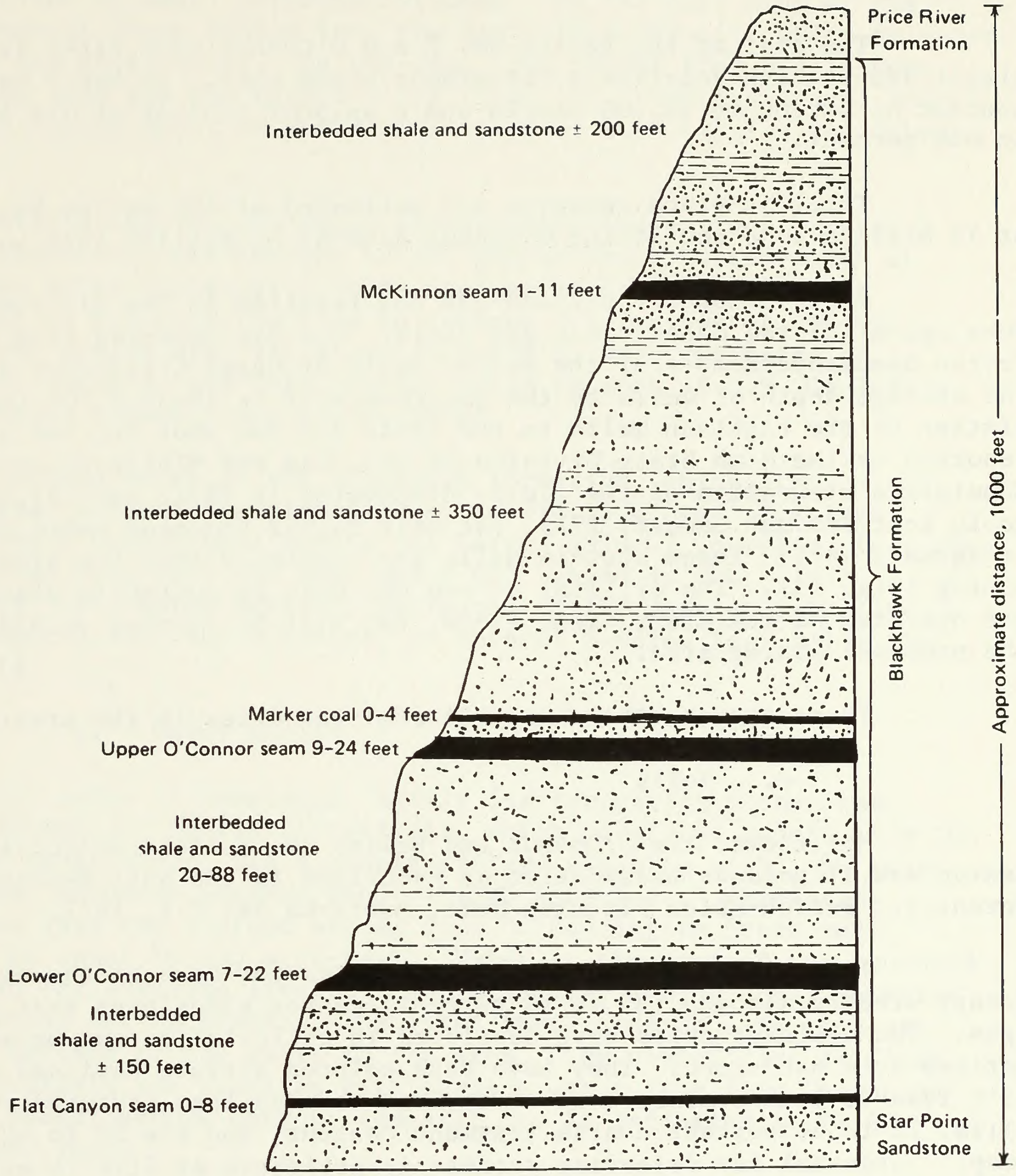


Figure 12.--Generalized stratigraphic column, O'Connor mine, sec. 31, T. 13 S., R. 7 E.

b. Energy and Minerals

Coal, the principal energy resource, and the Wasatch Plateau coal field, are discussed in part 1, chapter II.

The coal at the Belina No. 2 and O'Connor mine sites is classified as high volatile B bituminous steam coal. It has a heat content of 11,300 to 12,700 Btu/lb and a sulphur content of 0.4 percent to 0.8 percent.

Total in-place reserves are estimated at the Belina No. 2 mine at 52 million tons and at the O'Connor mine at 27 million tons.

Exploration for oil and gas has resulted in the discovery and development of the Clear Creek gas field. Gas was produced from the Ferron Sandstone Member of the Mancos Shale of Upper Cretaceous age. The average depth of wells to the gas reservoir is about 4,700 feet. Sixteen of the eighteen wells in the field are now shut in; two are reported by the Utah State Division of Oil, Gas and Mining as producing. Cumulative production of the field, discovered in 1951, was 135,781 million cubic feet through January 1978, but only 14,952 thousand cubic feet in January 1978. Three shut-in wells are located within the area of mining (fig. 15). The drilling of one new well is currently planned by the operator of the Clear Creek field, but will be located outside of the proposed mining area.

There are no other known mineral resources in the area.

c. Soils

Soils over the O'Connor and Belina No. 2 mines belong to the Canyon and Ridgelands Association as described in the Soil Resource Inventory, Ferron-Price Planning Unit, Munti-La Sal N.F. 1977.

The portal and mine facilities sites for each of the mines occupy steeply sloping (30 to 50 percent) canyon sideslopes near drainages. The dominant soils have developed in colluvial parent materials derived from sandstone. They have dark colored surface horizons with a silt loam to loam texture over sandy loam to clay loam textured subsoils, 20 to 60 percent coarse fragment content, and are 20 to 40 inches deep. Potential for reseeding success is estimated at five to eight years out of ten (based on Hagihara, and others 1972). Natural erosion by water where vegetation is present is estimated at about 0.2 cubic yards per acre per year, but the erosion potential could approach 20 cubic yards per acre per year when the soils are exposed.[1]

Suitabilities of the soils are limited primarily by their steep slopes which make them physically difficult to manage, increase the chance of instability, and increase the runoff potential.

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[1]Estimated using the Universal Soil Loss Equation described by the Soil Conservation Service (1975).

3. WATER

The proposed mining area is drained on both sides of the drainage divide by small perennial streams. On the east side of the divide, Pleasant Creek drains into the Scofield Reservoir, which releases water into the Price River. On the west side, water from Huntington Creek drains into the San Rafael River (fig. 13). Average annual runoff is about 10 inches based on water yield maps of Utah (Bagley and others, 1964).

Within the two drainages ground-water bodies feed perennial streams. Therefore, any changes in the ground-water system--such as lowering the water table--will cause changes in the surface-water system--such as reducing the flow to streams. Relations of the two basins to the mining area are shown in table 2, with estimates of ground-water recharge and infiltration based on work of U.S. Geological Survey (written commun., Don Price, 1976).

Perched water in the Blackhawk Formation, which lies in and above the coal beds in the mining area, is little known. Previous mining of the O'Connor beds during the period 1956-67, however, indicated that the mines were wet, and some water was pumped to the surface periodically. The water table is estimated to lie just above Eccles Creek at about 8,300 feet altitude, or several hundred feet below the mine portals.

a. Water Supply

All water is committed, mainly for irrigation downstream (about 98 percent). Scofield Reservoir, which regulates runoff from the upper Price River basin, has a usable storage capacity of 65,780 acre-feet. Annual releases average about 45,000 acre-feet. Streamflow records show that the average annual flow of Huntington Creek near Huntington is about 70,000 acre-feet. Water in the area of the proposed mine is used for watering livestock and wildlife, mining coal, domestic use, fisheries, and recreation; the first three consume less than one-tenth of 1 percent of the water in the area. The communities of Clear Creek and Scofield are supplied with surface water from Finn Canyon and springs in Boardinghouse Canyon; domestic use is estimated to be 40 acre-feet per year.

Data on ground-water use is scant. Wells in the Scofield area are estimated presently to supply 50 acre-feet per year for mining and domestic use. Well yields are not expected to be more than 50 gal/min. from sandstone beds and fractured shale.

b. Water Quality

Surface waters in the upper Price River basin are fresh and are generally of the calcium bicarbonate type (Mundorff, 1972). Chemical analysis of 10 samples collected from Pleasant Valley Creek above

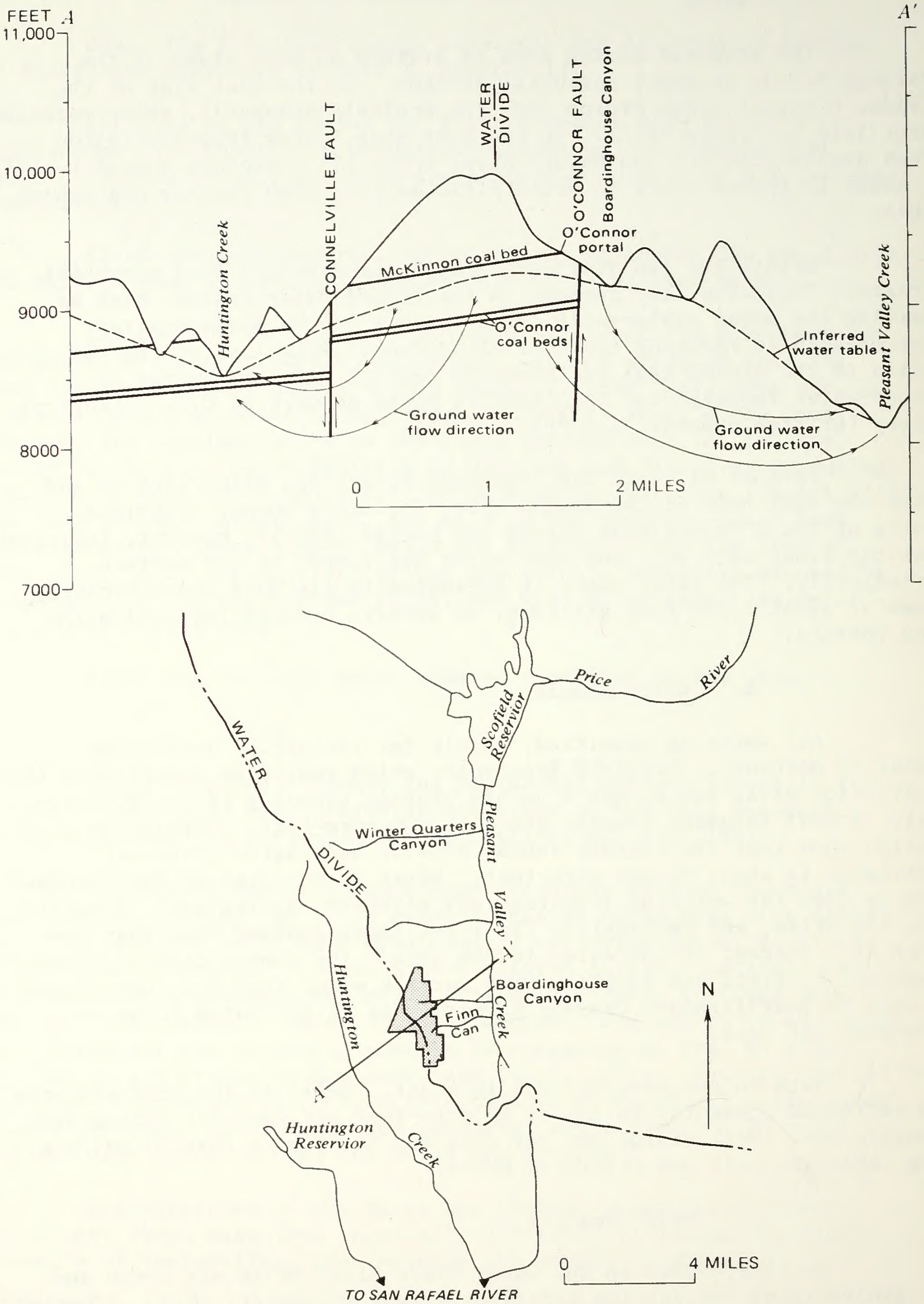


Figure 13.--Section and map through O'Connor lease area, showing probable ground-water flow. Coal beds assumed dip of 5° NW.

Table 2.--Water resources in the Belina-O'Connor mining area

	Pleasant Valley drainage	Huntington Creek drainage
Drainage area (acres)	37,800	[1]120,320
Mining area (acres)	1,980	760
Percent of drainage area	5.24	0.63
Total runoff (ac-ft/yr)	31,500 (estimated)	60,060
Estimated runoff from mining area (ac-ft/yr)	1,650	630
Estimated ground-water recharge on mining area (ac-ft/yr)	410	160
Estimated ground-water infiltrating through coal beds in mining area (ac-ft/yr)	100	40
Percent of total runoff	0.3	0.06

[1]At USGS gaging station (discontinued) 7 miles northwest of Huntington.

Scofield Reservoir in 1975-76 contained dissolved-solids concentrations ranging from 380 to 566 mg/L; only one sample exceeded the limit of 500 mg/L recommended by the Public Health Service for human consumption.

Ground water in the mountainous headlands normally contains concentrations of less than 500 mg/L dissolved solids. However, three samples of mine drainage, probably from the Blackhawk Formation, contained dissolved solids ranging from 374 to 794 mg/L. All three exceeded allowable limits for human consumption in iron content but were within allowable limits for heavy metals and trace elements.

Disolved-solids concentrations increase as ground water migrates eastward toward the discharge areas of the Price and Green Rivers. Also dissolved-solids concentrations normally increase with depth. However, deep gas wells in Pleasant Valley have tapped fresh water (310 mg/L dissolved-solids) at a depth of 3,865 feet in the Ferron Sandstone member of Mancos Shale.

4. AIR

Particulates are the only pollutants that would make a significant contribution to air pollution as a result of mining activities. Increases in other pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, and photochemical oxidants would be negligible.

An annual average background level for TSP in rural central and southern Utah areas of 20 micrograms per cubic meter ($\mu g/m^3$) has been estimated (AeroVironment, 1977). This is significantly below the Federal secondary standard of 60 $\mu g/m^3$. Because of proximity to existing mines (part I, chapter II, background total suspended particulates (TSP) levels may be higher than average for rural areas. The short term (24 hours) NAAQS can be exceeded in rural Utah as a result of windblown dust.

The background visual range was estimated to be 37 miles (60 km), 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 demonstrated an average of 67 miles for the period September 1970 to March 1971. Average visual range calculated from particle size distribution at Bear Creek and Huntington Canyons in 1974 was approximately 45 miles.

Analysis of photographs taken at Clawson, Utah 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 have shown averages between 94 miles in November - December 1976 and 54 miles in April 1977 (Pueschel and others, 1978).

5. VEGETATION

Most of the area overlying the project is covered with the Conifer-Aspen type on the north-facing slopes and the Aspen type interspersed with Mountain Meadows on the south-facing slopes. The Conifer-Aspen type includes Douglas fir, Englemann spruce, alpine fir, aspen, current and very little understory vegetation. The Aspen type produces aspen with a heavy understory including big sagebrush, Gambel oak, bitterbrush, lupine, dandelion, snowberry, mountain bluebells, wheatgrass, brome, fescue, sedge, yarrow, and aster. The Mountain-Meadow type includes slender wheatgrass, bluegrass, needlegrass, yarrow, larkspur, cinquefoil, sedges, sagebrush, and rabbit brush.

The range areas are generally in fair condition, while the spruce trees are being infested with spruce bark beetles. The Task Force files contain a more detailed description of these vegetative types including a species list.

No threatened or endangered plants have been identified on the lease tract (Welsh, 1977).

6. WILDLIFE AND FISHERIES

The project is in mule deer summer range on deer herd unit 32 (part, 1, regional EIS, chapter II). Winter range, which is outside the lease area, limits the herd population during the winter. Present deer population is below the carrying capacity of the range, and productivity is slightly below the State average. Parts of the lease area are known to be used for fawning. During 1970-76 the average deer highway mortality on the unit was 26 per year. Most of this highway kill was on US 6 between Helper and Soldier Summit, an access route to the proposed mine.

Elk use parts of the lease area for calving and for summer range. Moose use it year round, and the riparian habitat in Boardinghouse and Eccles Canyons is critical winter range. The present use of the road in Eccles Canyon and the additional disturbance expected because of proposed construction and use of a conveyor to the operating Belina No. 1 mine (fig. 15) will eliminate the potential use of Eccles Canyon by moose.

Cougar range throughout the lease area; they follow deer and (or) elk. In the 1975-76 season, hunters spent 79 days hunting cougar in unit 32 and killed 4.

Drainages provide habitat for an extensive beaver population. The trapping unit that includes this area ranks as one of the better beaver trapping areas in the state. During the 1975-76 season, licensed trappers harvested 51 beaver on the unit, and Utah Division of Wildlife Resource trappers took 26 beaver in response to nuisance complaints by landowners. River otter have been trapped illegally from the Fish and Pondtown Creek drainage west of Scofield Reservoir recently, which indicates they are still present but not included in State reports. Other species include various raptors, bear, snowshoe hare, blue grouse, ruffed grouse, and mourning dove. Sage grouse are found north and east of the town of Scofield. A strutting ground is located approximately 2 miles north of Scofield Reservoir. Mink and muskrat are furbearers found in the riparian habitat in canyon bottoms.

The American peregrine falcon is an occasional visitor. No other threatened or endangered species are known to occur.

Fisheries in and near the area include Scofield Reservoir, Price River, Huntington Creek, and their tributaries. The only fishery that may be directly impacted by mining is along Huntington Creek upstream from Electric Lake (fig. 14). The low flow is the critical limiting factor controlling production from the cutthroat nursery in that section of Huntington Creek. A description of fisheries in the region of this mine is included in chapter II, part 1, regional EIS.

B. CULTURAL ENVIRONMENT AND LAND USE

1. LANDS

The proposed operations include 640 acres of private surface-Federal coal ownership and 1,650 acres where both the surface and the coal are federally owned. The Forest Service is the Federal surface management agency.

Township 13 South, Range 6 and 7 East presently includes four unimproved graded dirt roads and two graded dirt roads. Nearly all of the proposed surface disturbance is on private land. Only small segments of the access road near the O'Connor mine portals in Boardinghouse Canyon would be on public lands. These are on lease and included in the mine plan.

The zoning ordinances of Carbon County permit coal mining in the proposed area. All mining development on National Forest land will be subject to the Forest Service Ferron-Price Unit Management Plan, which will be completed in 1978, and the present Price Ranger District Multiple Use Plan.

The Forest Service, through the land-use-planning process, has determined that subsurface mining is compatible with other uses of this land. Principal surface uses at present include producing forage and habitat for livestock and wildlife, watershed, recreational use by sightseers and hunters, and sparse timber production.

There are special land-use permits within the lease boundaries. Tenneco Oil has a 1.8-mile road right-of-way, which is used for

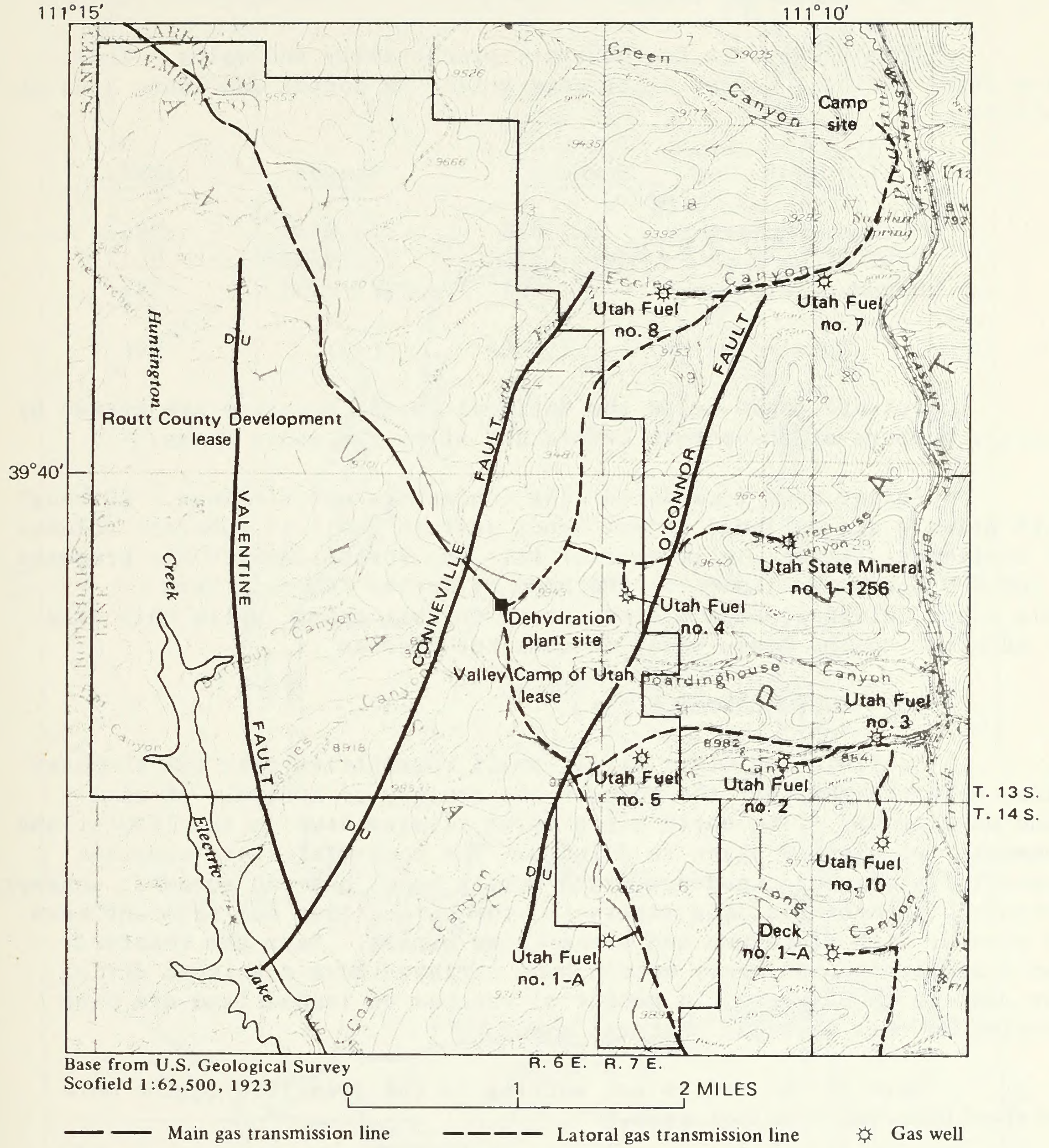


Figure 14.--Map showing gas lines and wells on Routt County Development, Ltd., and Valley Camp of Utah, Inc., properties and vicinity.

access and maintaining well sites on private land. Mountain Fuel Supply Company and Utah Natural Gas Company have a gas pipeline easement, which trends along the present road (fig. 14). Sanders Associates, Inc. has a special use permit for a communications building.

2. RANGE AND TIMBER

This range area has moderate productivity and value. Sheep from three National Forest Allotments graze the portal and lease area as follows:

Allotment	Numbers	Season	AUM's
Burn out----------	628	7/1-9/30	384
Coal Ridge--------	377	7/1-9/30	201
Monument Ridge----	601	7/1-9/30	361
Total--------	1,606		946

Private lands below the National Forest Boundary are grazed by similar numbers of sheep both before and after the above dates.

Forest uses include cutting fenceposts and firewood. Although both private and National Forest lands sustain small to moderate volumes of sawtimber, little use is made of it. The Forest Service has proposed a 500,000 board feet sale for the head of Eccles Canyon. This sale would salvage insect-killed spruce in that area. While this sale is adjacent to the lease area, it does not overlap it.

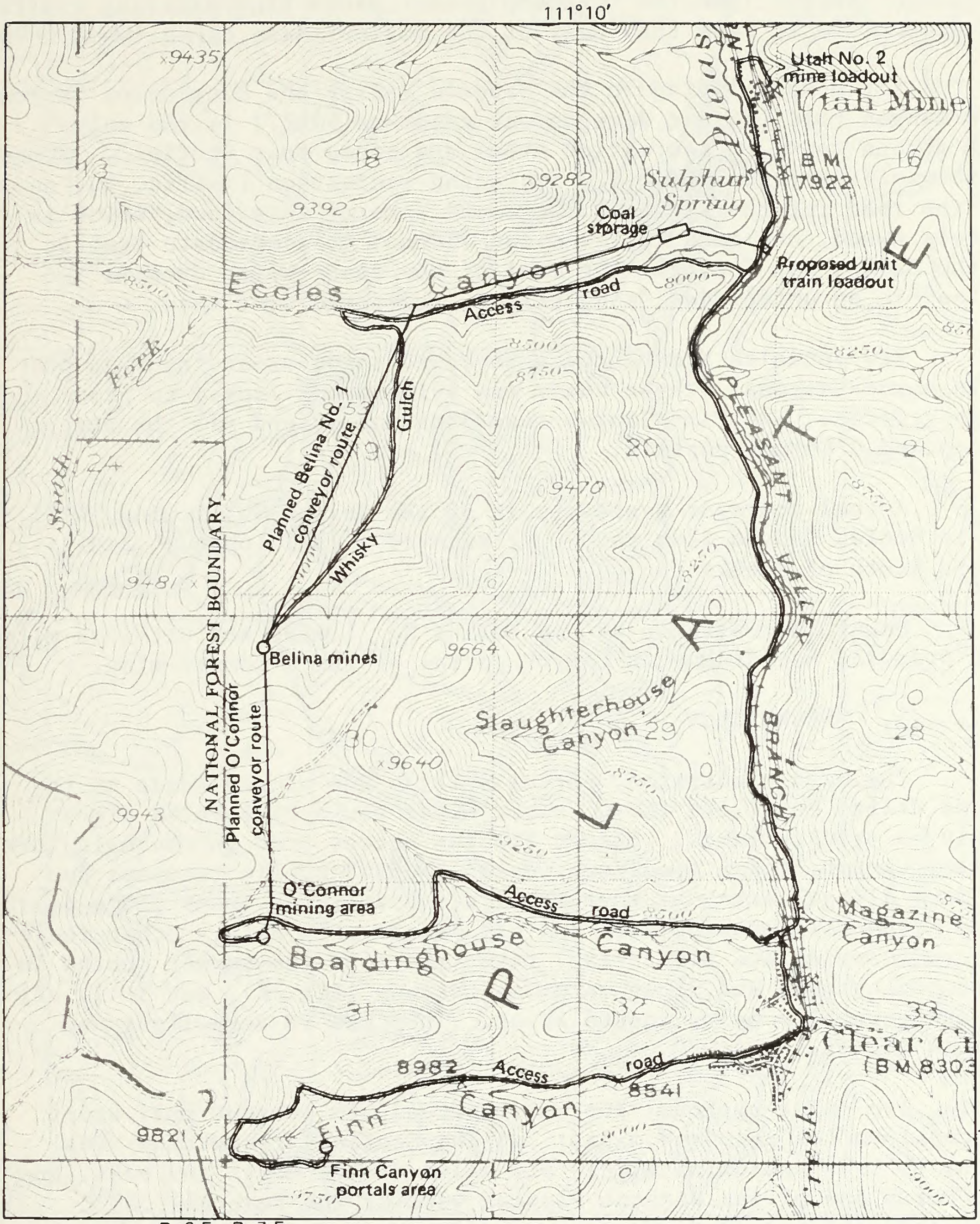
3. SOCIOECONOMICS

Scofield and Clear Creek, small communities near the proposed mine, were created near the turn of the century as a result of coal mine development. The early mines began closing down in the 1930's, and community population began to dwindle. The communities are composed essentially of small wood-frame and mobile homes and are somewhat unkempt. Because of nearby Scofield Reservoir, the communities and adjacent area is popular with fishermen and summer home owners. Near the reservoir small mobile and temporary wooden home enclaves have developed during the last 10 to 20 years. A number of ranches on leased land are also located in this markedly pastoral scene.

Most of the miners now working in the area live in the more metropolitan Price-Helper area.

4. TRANSPORTATION AND UTILITIES

The mine area is accessible from US 6 and via Utah 96 (U-96) and present roads up Eccles, Boardinghouse, and Finn Canyons (fig. 15). The Denver and Rio Grande Western Railroad maintains the rail spur from their mainline at US 6 up to a short distance above Scofield for the present mines; the section from just below Eccles Canyon to Clear Creek is in disrepair (fig. 15).



Base from U.S. Geological Survey
Scofield 1:62,500, 1923

Figure 15.--Map showing access roads and conveyor systems for Belina and O'Connor mines.

U-96 is the only all-weather or improved asphalt access route to the Pleasant Valley-Scofield area. About 345 vehicles per day (v.p.d.), including recreation traffic, travel this route. It is fairly easy to travel but has some bad curves near the Scofield Reservoir. Anticipated traffic from the Belina-O'Connor mines plus existing traffic would accumulate to less than half of the maximum safe capacity of U-96.

For people living in the Sanpete Valley and Huntington Canyon, Eccles Canyon road (forest development road No. 50227) is the only direct access route to recreation areas and mines near Scofield. Summer traffic would average 50 v.p.d., including recreation traffic, but snows close the road for the winter. The lower part of this road, which is privately owned, has been improved and widened to accomodate traffic from the Belina No. 1 mine. The rest of the road--which crosses two counties--is an unimproved, single-lane, low-speed dirt road.

Few vehicles travel the unimproved roads ascending Finn and Boardinghouse Canyons. These roads are private and locked to prevent through traffic. The Finn Canyon road does not extend all the way to the proposed O'Connor portals.

A coal conveyor system, part of the Belina No. 1 mine, will be built in Eccles Canyon from the No. 1 mine to a rail loadout facility near the mouth of Eccles Canyon.

Power is available at the Belina No. 1 mine and within a mile of the proposed Boardinghouse Canyon portal of the O'Conner mine.

5. RECREATION

The mine plantsites, portal entries and access roads to the proposed Belina No. 2 and the O'Connor mines would be located almost entirely on private lands. Except for the access road in the main fork of Eccles Canyon, these lands are posted against public trespass and use. Some illegal entry by four-wheel drive vehicles takes place in these canyons, especially during deer and elk season each fall. Other recreation use (camping and picnicking) takes place in the summer months in Finn, Boardinghouse and Slaughterhouse Canyons (fig. 2), but it is off-lease and generally below posted areas. This use is very light and causes no impact.

Two major regional recreation areas are present only short distances from the proposed mines: a) The Scofield recreation area adjacent to U-96 approximately 10 air miles to the north and east, and b) the north end of the Wasatch Plateau west of the Federal coal leases (fig. 16).

Access to the Scofield Reservoir area is by U-96; the upper elevation areas on the north end of the Wasatch Plateau can be reached by U-31. The Eccles Canyon Road (Forest development road 50227) is the only direct connecting access route between the two areas. Above the

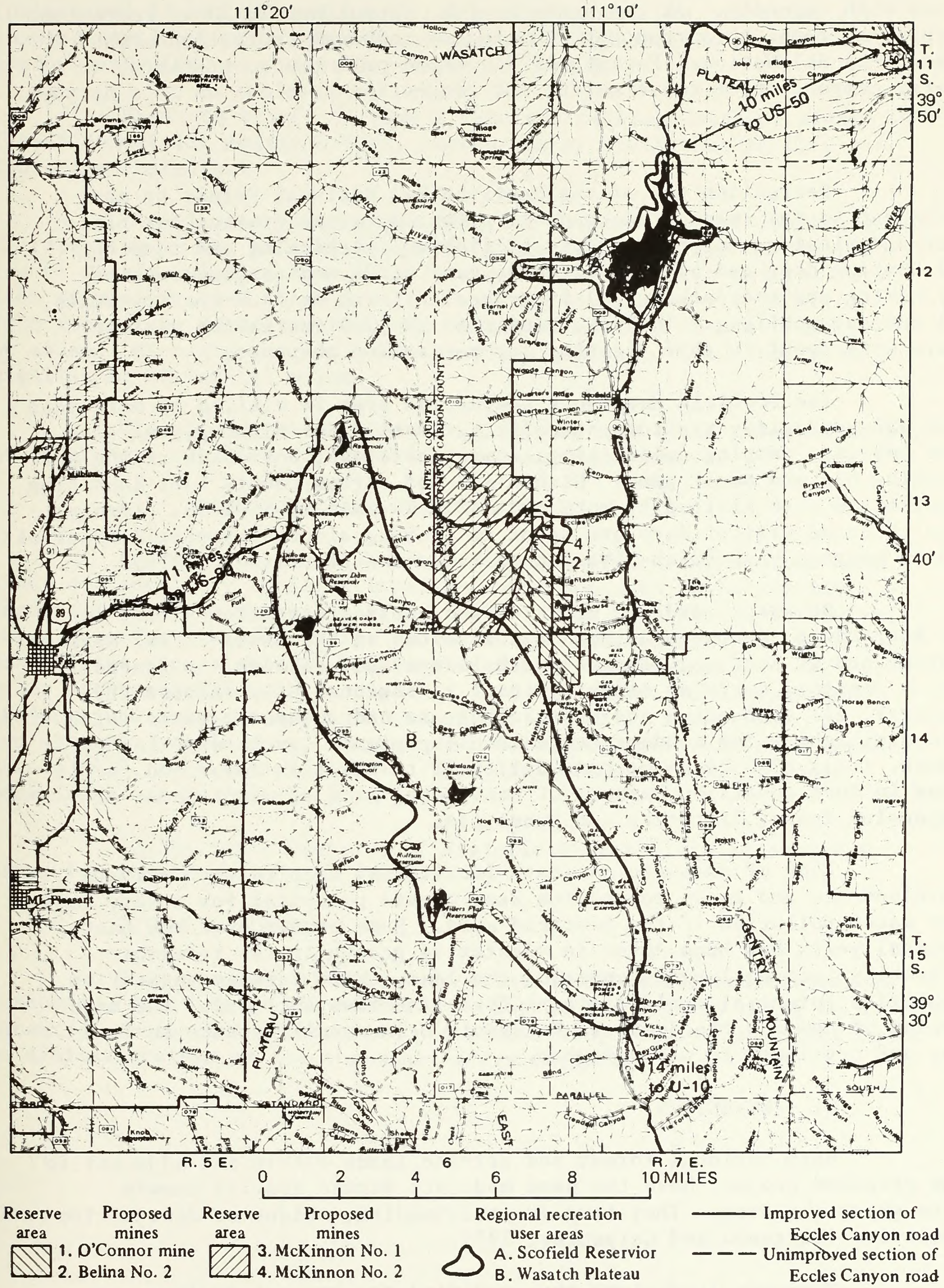


Figure 16.--Map showing regional recreation user areas in the north portion of the Wasatch coal field.

Belina No. 1 mine turn-off, the Eccles Canyon road is a single lane dirt road with turnouts. At the present time, approximately 30-40 recreation vehicles travel this road between the two regional recreation areas (Manti-La Sal National Forest, 1977). Some pull boats, trailers, or carry campers which cause safety and congestion problems on this narrow road.

Recreation use of the Manti-La Sal National Forest on and adjacent to the lease area consists primarily of a) driving for pleasure and viewing the environment, b) fishing, picnicking and camping, c) hunting deer and elk, small game, game birds and nongame species, d) hiking and backpacking, e) four-wheel driving on back-country roads, f) and snowmobiling. In 1976, more than 190,000 recreation visitor days were spent in this vicinity for recreation purposes.

The Scofield Reservoir recreation area is visited by more than 100,000 recreation visitors annually, primarily for fishing, but also for boating, camping, picnicking, summer home use, horseback riding and hunting big and small game. Utah State and Carbon County boat launching facilities were visited by more than 42,000 visitors in 1976. Twenty-two thousand visitor days are spent in fishing alone at Scofield Reservoir on an average year (Utah Division of Parks and Recreation, 1976).

Occupancy and use of developed public recreation sites, such as boat ramps, campgrounds, and picnic sites on the Manti-La Sal National Forest and at Scofield, except for holidays and weekends, is generally below designed carrying capacity (part 1, regional EIS, chapter II). However, all such sites are approaching use and occupancy rates which are diminishing the outdoor recreation experience levels expected by users. It is also becoming more difficult to maintain developed facilities in good condition because of heavy use, lack of maintenance or expansion funds, littering and vandalism.

Lack of adequate sanitary facilities, coupled with private developments and heavy recreation use, create potential for severe land and water pollution in the Scofield area. Some change over the past several years has been noted in vegetative growth in the reservoir, primarily from pollutants entering the lake. With further vegetation, fisheries potential could diminish (see fisheries section). The major season of use for the Scofield Reservoir area usually starts in late May and continues to mid-November.

6. ESTHETICS

Both National Forest and private lands within and adjacent to the proposed project have the same moderate scenic quality common throughout the area. They have few outstanding, unique or distinctive qualities (Torgeson and Carpenter, 1975).

Man-made intrusions have modified the natural landscape character on both private and National Forest lands involved in the proposal. Modifications and intrusions consist of numerous low-standard (primitive) roads, oil and gas drill pads, natural gas pipelines and pumping stations, mine remnants, power and telephone lines and range improvements (fences, water developments, etc.).

Visitors expect to view a natural landscape without significant industrial modifications, intrusions or activities in this landscape character.

Visual management objectives for National Forest lands are: a) retention of the natural landscape character seen from recreation travel routes (usually from 0 to 2 miles distance), b.) partial retention or modification which simulate natural conditions 2 to 5 miles from recreation travel routes, and c) rehabilitation of old (inactive or unused) minesites, roads, powerlines, pipelines, etc., not having significant historical value.

Visual management objectives for private lands involved in the proposal have not been identified by private land owners.

7. ARCHEOLOGIC AND HISTORIC VALUES

Recent archeological reconnaissance of the undisturbed mine plant and ancillary facility locations show the area to be heavily vegetated with few natural shelves suitable for prehistoric or historic occupancy sites (Wikle, 1977). No cultural sites or material were found Most of the mine plantsite has been disturbed by previous mining. Previous archeological work in the area for drill pads, mine expansion projects and access roads show no cultural material except for one isolated projectile point fragment (Archeological Environmental Research Corp., 1975, 1976 Walker, 1977). This area probably received only occasional use by Indians.

The National Register of Historic Places lists no cultural sites for the area.

C. FUTURE ENVIRONMENT

This proposed mine is near existing mines and constitutes an extension of mining by the operation. Except for impacts owing to a potential increase in production and population, future conditions would be similar whether or not the mine enters production.

CHAPTER III: ENVIRONMENTAL IMPACTS

A. NATURAL ENVIRONMENT

1. GEOLOGY

The surface above the entire 2,740 acres of mine workings of the Belina No. 2 and O'Connor mines would be subject to subsidence. Over the 1,700 acres of Belina No. 2, an average of 11 feet of the Lower O'Connor bed would be removed. This would be in addition to the 11 feet of the overlying Upper O'Connor bed to be extracted first by the Belina No. 1 mine.

Mine workings at the O'Connor mine would extend over 1,040 acres. East of the O'Connor fault, a minimum of 22 feet of coal probably would be removed from the O'Connor beds, which lie in places within 300 feet of the surface. West of the O'Connor fault, 11 feet of coal probably would be removed from the McKinnon bed, which lies 100-700 feet from the surface; 350 feet of interburden separate the McKinnon bed from the lower-lying O'Connor beds being mined from the Belina mines. Subsidence potential and possible effects are described in general in chapter IV, part 1.

At a recovery rate of 50 percent, an estimated 39 million tons of coal would be removed from the Upper O'Connor, Lower O'Connor, and McKinnon beds. Unmined coal, estimated at 39 million tons, would remain in place as pillars, fire walls, and other roof-supporting structures.

Impacts to paleontological resources would consist of losses of plant, invertebrate, and vertebrate fossil materials for scientific research, public education (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 fossiliferous 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 presently assessed due to a general lack of specific data on such activities.

Due to the present lack of data and accepted evaluatory criteria for determination of significance, no meaningful assessment can be presently 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.

2. SOILS

The proposal would result in disturbance of soils on 22 acres in the Canyons and Ridgelands Landtype Association in addition to the lands already disturbed (table 1). When the project is completed, a total of 96 acres would be reclaimed, 74 of which had been disturbed prior to the proposed action. Part of the 96 acres might remain occupied by permanent structures such as roads, and not regain productivity.

Soil impacts would be quite severe at the minesites because of cutting and filling for leveling on the steep slopes. Onsite erosion rates could increase by 20 cubic yards or more per acre per year on exposed soils. With erosion control structures, however, the rates should be less than 6 cubic yards per acre per year. Sediment leaving the disturbed areas would be minimal if proper erosion control measures were implemented. Nevertheless sediment delivery to the streams in Boardinghouse Canyon and Finn Canyon could be a problem as a result of a severe climatic event.

The soils have good potential for revegetation. Productivity on the reclaimed sites would not be significantly reduced, although productivity of disturbed lands would be lost during the life of the project.

3. WATER

If dewatering from beneath Huntington drainage is required during mining, water may be diverted from Huntington Creek basin to Pleasant Valley. Diversions likely would be much less than the 40 acre-feet per year that infiltrates through the coal beds in the mining area, because intercepted water would tend to percolate downward into the underlying strata. Forty acre-feet per year is 0.06 percent of the average annual flow of Huntington Creek.

It is not known whether mining-induced subsidence would cause perched water zones to rupture and infiltration to increase. If it did, its significance is impossible to ascertain because too little is known about perched water in the area. Probably as much as 400 acre-feet per year of surface water above mines could be diverted into the ground, but would return to springs or streams down gradient.

a. Water Supply

Obtaining the 1,000 acre-feet per year (850 for municipal use and 150 for mining) needed to implement the proposed action may cause as much as a 575 acre-foot-per-year reduction in the water available to immediate downstream users for about 10 years. (About half of the municipal water would be returned to the hydrologic system as treated effluent and be available to users farther downstream.) For an additional 15 years, about 400 acre-feet per year of water would be needed, which would correspond to a 225 acre-feet-per-year-reduction for downstream users. The secondary impacts of withdrawing 575 acre-feet per year are not expected to be significant, because 575 acre-feet per year is only 0.5 percent of the amount normally used.

b. Water Quality

The chemical quality of water in the area might be deteriorated. Subsidence and subsequent fracturing of the overburden would tend to cause more ground-water movement and increase the potential for leaching of chemical constituents. This might lead in turn to increased concentrations of dissolved solids (perhaps as much as 10 percent in local surface and ground waters. However, chemical changes in water quality in Scofield Reservoir, the Price River below Scofield, and Huntington Creek probably would be insignificant.

4. AIR

The main sources of total suspended particulates would be dust from vehicle travel on the Eccles Canyon, Whisky Gulch, Boardinghouse Canyon, and Finn Canyon roads, and coal particles at coal handling sites. Most coal particles would settle at 0.6 mile (1 kilometer) downwind. Should the access roads not be paved, heavy traffic at shift changes would cause high levels of TSP.

Relating dust emissions AeroVironment (1977) has estimated maximum 24-hour average concentration of TSP associated with vehicle travel on an unpaved road network to the mine portals, assuming a 50 percent reduction for watering unpaved roads. The incremental increases in TSP due to the Belina No. 2 mine could be as high as 75 $\mu g/m^3$. When the 75 $\mu g/m^3$ value is added to other sources of TSP along the Eccles Canyon road, including dust from the Belina No. 1 and McKinnon Nos. 1 and 2 mine traffic and the natural background, it is estimated that maximum 24-hour TSP concentrations could be as high as 300 $\mu g/m^3$. Concentrations along the Whisky Gulch road could be as high as 170 $\mu g/m^3$. The Federal secondary standard, which does not apply here, is 150 $\mu g/m^3$.

Incremental increases along the Finn Canyon and Boardinghouse Canyon roads leading to the O'Connor mine could be as high as 40 $\mu g/m^3$ and 65 $\mu g/m^3$, respectively.

Total annual potential emissions from the Belina No. 2 mine (coal storage, transfer, and conveying) and fugitive dust from auto and supply truck travel on the unpaved Eccles Canyon and Whisky Gluch roads would be an estimated 400 tons (50 tons from mining activities and 350 tons from traffic on the unpaved roads. Total annual emissions from the O'Connor mine (coal storage, transfer, and conveying) and fugitive dust from auto and supply vehicle travel on the unpaved Finn and Boardinghouse Canyon roads would be an estimated 540 tons (60 tons from mining activities and 480 tons from traffic on the unpaved roads.

Visibility would be impaired significantly in the vicinity of the Eccles Canyon, Whisky Gulch, Boardinghouse Canyon, and Finn Canyon roads by dust associated with travel to and from the mines. The impact would be short term in duration, confined mainly to periods of heavy traffic.

5. VEGETATION

The most serious impacts on vegetation would be caused by the portal facilities, access roads, powerlines, and coal conveyor. Approximately 22 acres in the Conifer-Aspen, Mountain Meadow, and Aspen vegetative types would be destroyed. An additional 41 acres already have been impacted by existing facilities. No impact is foreseen on the vegetation overlying the mines during the life of the proposed project.

No threatened or endangered plant species would be impacted by the proposal.

6. WILDLIFE AND FISHERIES

Wildlife would lose habitat by the amount of land occupied by or disturbed in the construction of the various ancilliary facilities. The conveyor from the O'Connor to the Belina mines would block big-game migration and reduce wildlife habitat. Numbers of such animals would be reduced. A greater loss in habitat would result from wildlife avoiding areas with the noise, lights, traffic, etc. The impacts may be short term, depending on the quality of rehabilitation after mining. The impacts on deer and elk would be as follows:

	Deer	Elk
Loss of summer habitat due to occupancy (acres)	22	22
Reduced summer habitat use due to activity (acres)	782	1,890

Increased traffic would increase the vehicle-strike hazard for birds and increase the risk of perching raptors being shot if the powerline is within 100 yards of the road.

Beaver habitat and numbers would be reduced by new roads, culverts, and bridges. Because of the impact upon new transportation facilities from beaver-originated damming and flooding, the Utah Division of Wildlife Resources would have to reduce the beaver population in the Scofield Reservoir drainage.

Changing surface-water and ground-water conditions may affect the distribution of terrestrial animals. Data on potential change are not adequate to quantify the possible animal losses or changes. Loss or reduction of water flows in Eccles, Boardinghouse, or Finn Canyons could degrade beaver, mink and muskrat habitat.

In the long run, increased water drainage into Huntington Creek would make Huntington Creek above Electric Lake a better cutthroat nursery. However if mine dewatering diverts water from Huntington Creek to Pleasant Valley, natural cutthroat production in Electric Lake could be affected adversely. Even a small decrease in already-low summer flows in Huntington Creek would affect adversely cutthroat production. Other fisheries in the region would be impacted by the population increase accompanying this proposal.

B. CULTURAL ENVIRONMENT

1. RANGE AND TIMBER

The vegetation destroyed by the project would reduce the livestock grazing capacity by approximately 4 AUM's. The access roads, coal conveyor, and portal facilities would disrupt normal grazing patterns to a moderate degree. Watering places might be changed or lost through subsidence. This also might cause the vegetation to change to a more dry-land type less suitable for grazing causing some loss of grazing capacity.

A small volume of fenceposts and firewood along with 20 mbf of sawtimber also would be destroyed by the project. Access for harvesting forest products would be enhanced by the improved roads, but conflicts might occur with mine and increased recreation traffic. Insect populations could build up in the woody debris caused by the clearing operation and damage nearby timber.

2. SOCIOECONOMICS

The proposed action could add about 4,350 residents. (This is about 15 percent of the population at the projected production level--see part I). Distribution of this new population is not known, however, a large percentage undoubtedly would live in the Price City-Carbon County area.

Greatest impacts would be due to local urbanization associated with mine development, i.e., development of additional permanent or mobile housing, construction of new school space, and changes in existing community services.

Other impacts would be taxation and bonding of local residents (or perhaps county or state-wide residents) to construct, operate, and maintain sewers, water systems, streets, garbage and trash collection, police, fire, and public health services.

The mine would produce higher average incomes and an increased tax base. This would expand the economy in Carbon (see part 1, chapter IV, socioeconomics).

3. TRANSPORTATION AND UTILITIES SYSTEMS

The most severe transportation-related impact would be the short-term (10-year) conflict between mine and recreation traffic. About 4 hours a day commuting miners in a hurry to get to and from work would compete with slower recreation traffic. This conflict would be compounded by increases in traffic. Volume on U-96 is expected to triple and that on the Eccles Canyon road to double (an increase of 330 v.p.d., 40 of which would be supply trucks). Physically, the increase is within the capacity of U-96 and the upgraded section of Eccles Canyon Road.

Upgrading roads and thereby improving access into Finn and Boardinghouse Canyons will have little impact. Traffic on the Boardinghouse and Finn Canyons roads would increase from virtually nothing to about 480 v.p.d. each, including commuting miners and supply trucks. This would not affect other traffic, however, as there is little traffic in the canyons now and access would be controlled during mining and prohibited afterwards.

The conveyor system on private lands from the Belina mines to a coal loadout facility near the mouth of Eccles Canyon has not been built yet, but is to be part of the Belina No. 1 mining operation. The extension of the conveyor system from the Belina mines to the O'Connor mine would substitute for the movement of 500 truckloads per day from the three mines (Belina Nos. 1 and 2 and O'Connor) to the rail loadout.

4. RECREATION

Increased safety hazards and user dissatisfaction will occur along U-96 in the Scofield area from increased industrial traffic.

Placement of a conveyor-belt system and (or) increased industrial traffic in Eccles Canyon will seriously restrict or conflict and could eliminate some recreation traffic in this canyon.

Use of the recreation resource at Scofield and higher elevation areas on the north end of the Wasatch Plateau are expected to increase by at least 7.1 percent per annum without the proposed actions. At full mine production, recreation use of the two regional areas of concern could increase by an additional 27,270 visits and 50,900 recreation visitor days annually. Increased pressures for recreation pursuits could result in lowering of hunting and fishing success and decreasing uncrowded or unconfined recreation opportunities. There will be increased littering, vandalism and deterioration of developed and dispersed areas of use. Increased pollution of Scofield Reservoir will occur from additional use.

5. ESTHETICS

Proposed industrial developments, such as road realinement and widening, coal conveyor-belt systems and other ancillary facilities in

Eccles Canyon and vicinity would impose additional and significant industrial intrusion in the natural landscape. Much of the conveyor system would be prominent from travel routes within the area.

6. ARCHEOLOGIC AND HISTORIC VALUES

No sites were found during recent cultural resource surveys; however, sites may be found during 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 due to mining may result in more vandalism of cultural resources in the region. Surveys will add to the cultural resource knowledge of the region.

CHAPTER IV: MITIGATING MEASURES

Company-proposed and legally enforceable mitigations are included in chapter I, as they will become a part of the approved mining plan. Any other mitigations for the residual impacts defined in chapter III would be optional or alternative courses of action and are described in chapter VIII.

CHAPTER V: ADVERSE EFFECTS THAT CANNOT BE AVOIDED

The following adverse impacts would occur as a result of the proposed action.

Unavoidable destruction, disturbance, and removal of paleontological resources, both exposed and unexposed, would occur. The significance of this impact cannot be presently meaningfully assessed due to the lack of data and evaluatory criteria.

Twenty-two acres of previously undisturbed land would have vegetation removed and soils disturbed, resulting in temporary increased erosion rates of up to 20 cubic yards per acre per year and a loss of productivity over the life of the mining project.

Subsidence may occur over some of the 2,740 acres included in the mining plan. Some water resources, such as springs, probably would be adversely affected by dewatering.

Mining would divert 1,000 acre-feet of water per year from current irrigation use to mine or municipal use for 10 years, and 400 acre-feet for 15 additional years.

Even if Eccles Canyon Road were paved, the estimated maximum 24-hour incremental increase in TSP due to the Belina No. 2 and McKinnon Nos. 1 and 2 mine traffic would be approximately 60 $\mu g/m^3$. This would be well below the secondary NAAQS. Increases due to the Belina No. 2 mine alone would be approximately 20 $\mu g/m^3$. If the Finn Canyon, Boardinghouse Canyon, and Whisky Gulch roads were paved, incremental increases could be about 10, 20, and 20 $\mu g/m^3$, respectively.

Vegetation and the associated range and forest products would be lost on 22 new disturbed acres for the life of the mines.

Approximately 4 AUM's per year of grazing would be lost until the plantsite is rehabilitated.

About 20 mbf of timber would be lost on the new 22 acre disturbed area.

Impacts on deer and elk would include loss of 68 acres of habitat for mines and ancilliary facilities. Mine-induced activities would cause the loss of an additional 782 acres of deer habitat and 1,890 acres of elk habitat.

The O'Connor to Belina mines conveyor would block migration of big game and reduce wildlife habitat.

Increased commutor traffic would increase vehicle strike hazard for animals and birds.

The beaver population would have to be reduced.

Cutthroat reproduction in Huntington Creek above Electric Lake, may be adversely affected temporarily, if mine dewatering is necessary and affects the low flow of Huntington Creek.

Hunting and fishing success and satisfaction would decrease as a result of the proposed action and the increased populations and hunting and fishing pressures it would induce.

Accidents would increase as a result of competition between commuting miners or mine traffic and recreation traffic, especially during the summer. Conflict would occur on both U-96 and the Eccles Canyon road.

Increased use by the greater population caused by mining would exceed the capacity of present recreation facilities. It could also increase pollution of Scofield Reservoir and affect its fishing potential.

Some developed and underdeveloped recreation facilities and sites would be subject to overuse and deterioration.

Littering and vandalism would increase at the minesites, along roadways, and in recreation areas on the Wasatch Plateau.

Additional modifications and intrusions would impact the forest landscape of Eccles Canyon.

Increased population in the area may result in vandalism to archeological and historical sites within the region.

The direct impacts cannot be determined until an intensive survey is completed.

CHAPTER VI: SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Mining in the vicinity of the proposed Belina No. 2 and O'Connor mines is a long-standing land use. The proposed developments are a planned expansion and (or) replacement of existing contiguous and nearby mines. The No. 2 and O'Connor mine lives are 10 to 25 years, following which the area will be reclaimed.

Short term, as used here, includes premining development and construction, mining and coal transport, and post mining reclamation periods. Long term, as used here, begins after reclamation.

An undetermined number of univentoried exposed and unexposed fossil localities could be impacted or destroyed. Knowledge of paleontological resources could be acquired due to surveys and exposure of resources which might never have been found without excavation.

Twenty-two acres of previously-undisturbed land would be affected for the life of the mine. A significant part of the 41 acres devoted to present roads and abandoned plantsite would be rehabilitated with the 10 acres disturbed. This would enhance the watershed, vegetation, and grazing, as well as esthetics. Land subsidence above the 2,740 acres of mine workings would be a short-term impact. Secondary impacts of subsidence, however, would be long term. Additional surface water (as much as 400 acre-feet per year) would be diverted into the ground as a result of surface expressions of subsidence, but would increase recharge to ground-water reservoirs and speed the spring flow restoration.

Wildlife impact would be short term if the area were restored to near its present condition. However, if development and activity continue, some of the wildlife impacts described in chapter V would remain.

Short-term use of Eccles Canyon for mine-related traffic and the coal conveyor system would create immediate and serious conflicts of use and safety problems for recreationists travelling Forest Road No. 50227. After mining and reclamation, conflicts and safety problems would be reduced.

Increased use of the Wasatch Plateau for recreation purposes, resulting from the proposal, would be expected to continue after mining ceases.

The proposed conveyor belt system and other ancillary facilities in Eccles Canyon would create an immediate short-term change in the natural landscape of the canyon. After mining and reclamation, the natural landscape character would be partially restored, but some evidence of past mining activities would still be evident. Expressed in terms of a natural environment, scenic quality within the canyon, would be similar to the present (moderate) quality.

Any archeological sites disturbed during development of the site would result in a long-term impact to the inplace value of that site. Collection of sites that might be found will insure recording of information that could otherwise be lost to natural forces or vandalism.

CHAPTER VII: IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An undetermined number of uninventoried exposed and unexposed fossil localities would be impacted or lost.

The termination of coal mining operations would lead to a termination of pollutant emissions. Thus the air resource would not be irreversibly committed as a result of the mine operation. Emissions from secondary growth and related activity such as traffic, urban fuel consumption etc., induced by the proposed action would be more permanent in nature and result in a long-term commitment of the air resource to some deterioration.

Water would be consumptively used at the rate of 575 acre-feet per year for 10 years and 225 acre-feet per year for an additional 15 years. Changes in the surface and surface-water and ground-water systems because of subsidence could be permanent.

The estimated 39 million tons of coal that would be removed would be consumed as a nonrenewable resource. Unmined coal, estimated at 39 million tons, would remain in place. This amount would remain as an irretrievable resource unless and until suitable recovery methods could be developed.

Scofield Reservoir and higher elevation areas on the Wasatch Plateau would be irreversibly committed to increased recreation use on a long-term basis.

Any cultural resources in the immediate project area could not be preserved in place.

CHAPTER VIII: ALTERNATIVES

General administrative options available to the Secretary of the Interior are discussed in the regional EIS, part 1, chapter VIII. Detailed administrative alternatives and optional mitigating measures are listed below.

A. MITIGATING MEASURES

1. AIR

The application of watering to unpaved road has already been included as a design control method in the analysis of the proposed action. Watering, which is approximately 50 percent effective, would be most beneficial if done shortly before periods of heavy traffic. In another study (ERT, 1978), it was estimated that paving, or treatment with chemical stabilizers which approximate paving, could reduce fugitive dust emissions from roads by an additional 70 percent. If the Eccles Canyon road were paved, the maximum 24-hour incremental increase in TSP along the road could be decreased from about 190 to 60 $\mu g/m^3$. With paving, incremental increases along the Whisky Gulch, Boardinghouse Canyon, and Finn Canyon roads could be decreased from about 70, 60, and 40 $\mu g/m^3$, respectively, to about 20, 20, and 10 $\mu g/m^3$.

2. RECREATION AND ESTHETICS

The following mitigation measures would be needed by administering agencies outside the lease area:

1. Improving U-96 by widening and straightening restrictive or dangerous areas, signing, and imposing reasonable but safe speed limits.

2. Providing an alternate route between Scofield and upper elevation areas to separate mining and recreation traffic and provide adequate room for a conveyor-belt system.

3. Upgrading and expanding existing developed recreation facilities to accomodate increases in recreation use.

4. Providing more law enforcement and administrative services to minimize littering, vandalism, and increased pollution of lakes, streams, roadways, and dispersed areas of use.

B. ALTERNATIVES

1. NO ACTION

Pursuant to implied covenants of both the Federal mineral leasing laws and the existing lease agreements, the Secretary is obligated to respond to a legitimate application to conduct mining operations on a valid lease, provided that all terms and conditions thereunder have been met. His response may be approval as proposed, rejection on various legitimate grounds, approval in part and rejection in part, or approval subject to such additional conditions and requirements or modifications as he may impose under the laws. He may also defer decision, based on proper grounds, as described elsewhere in this chapter.

"No action" on proposals for continuation of approved ongoing mining operations would equate to closing down existing operations; under existing regulations, operations may not proceed in the absence of approved mining plans and related permits. The impacts of taking no actions in such cases would be approximately the same as those described under the following subsection C (2), "Cancel the leases."

"No action" on mining proposals for the initial development of existing leases would equate to maintaining the status quo on those leases. The impacts of taking no action in these cases would be the same as described subsequently under subsection C, "Prevent further development on existing leases."

If the Federal government does not approve the mining and reclamation plans, coal would not be mined from the proposed leases. If coal is not mined, there would be no transportation systems and hence little or no development in the area. The Federal government would need to evaluate purchasing the proponent's rights related to the coal leases, because coal mining would be foregone.

2. DEFER ACTION

For proper cause, the Secretary may defer final action on a proposed mining and reclamation plan. These could include, but are not limited to, the need and time required for:

1. Modification of the proposal to correct administrative or technologic deficiencies.

2. Redesign to reduce or avoid environmental impact.

3. Acquisitions of additional data to provide an improved basis for technical or environmental evaluation.

4. Further evaluation of the proposal and (or) alternatives.

The principal effect of deferring action on a proposed mining and reclamation plan on these grounds would be a comparatively short-term delay in the imposition of all related impacts of the proposal as previously described in the unavoidable adverse impacts section of this statement.

Once a mining and reclamation plan is approved, the regulations and lease terms require that all subsequently proposed departures and deviations therefrom be approved in advance by the USGS. The regulations

(30 CFR 211) also permit the USGS to direct that changes be made in previously approved operations. For example, changes could be ordered to accommodate new, improved, or revised administrative requirements, technologic improvements, environmental concerns or requirements, or revisions of prior evaluations thereof in the light of experience or previously unknown factors.

3. PREVENT FURTHER DEVELOPMENT ON EXISTING LEASES

The only alternatives to allowing development of existing leases is to prevent such development or to impose additional conditions and restrictions on the operations. The several apparent means of preventing full development are discussed below.

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, other comparable quantities of coal or sources of energy would be required to meet national needs. The development of other sources and related impacts is discussed later.

a. 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, and future suspensions of operations for reasonable periods, with proper grounds, could be imposed. The Secretary cannot, under present circumstances, suspend operations to the extent that a de facto 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 operations pending legislation remains available. Impacts of this alternative would be similar to those described in subsection C (2), "Cancel the leases."

b. Cancel the Leases (No New Development)

The Secretary does not possess authority to unilaterally cancel the leases except on the ground defined therein (section 7 or 8 of the lease terms--"Proceedings in case of default"). The authority to cancel on other grounds would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees as may be necessary. The Administration has not entered a request for such legislation, and the Congress has not initiated such action in 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 non-environmental concerns.

Present production could be interrupted temporarily or terminated completely, as could further development of all existing leases.

To the extent that coal production from existing leases was curtailed or halted, alternative sources of energy would be required to meet present needs and demands. These could be foreign and (or) domestic and are discussed in later pages. The time required to replace the resource foregone could range from scant to a number of years, depending on the specific alternative(s) selected and its state of production.

Environmental impacts of the proposals could range widely, depending on the administrative action taken on existing leases. If these leases were cancelled through Congressional authorization, proposed mines would be avoided. Conversely, should development eventually be authorized, environmental impacts as discussed in the impact chapter would occur. The net result would be a deferral and perhaps reduction of impacts through changed technology or requirements imposed at that time.

c. Federal Acquisition of Leases

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 under subsection C (2).

d. Reject the Mining and Reclamation Plans

Rejection of the proposed mining and reclamation plans would result in no environmental impact on the leased lands, and they would continue in their present condition, subject to modification by natural process and by the condition of other existing activity and uses--and to further modification by the surface owner to meet other uses.

The Secretary may reject any individual proposed activity 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 designed course of action by the lessee (operator). 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 Congress. Viability of this option is dependent upon timely legislative action; the option of rejecting the proposed plans pending legislation remains available. Impacts of this alternative would be similar to those described under subsection C (2), "Cancel the leases."

4. RESTRICT DEVELOPMENT ON EXISTING LEASES

The subject leases convey the right to develop, produce, and market the Federal coal resource thereof if all other terms and conditions have been met by the lessee. In general, the Secretary does not possess the authority to arbitrarily constrict development. 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.

Thus, under present conditions, a general effort to restrict or regulate development of existing leases 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.

5. APPROVE THE MINING PLAN AFTER MODIFICATION

A number of the impacts identified and described in chapter III of this statement could be more fully mitigated by the selective application of those measures described that are supplemental to the proposals of Valley Camp of Utah, Inc., or by implementation of one or more of the alternatives described below. In addition, special conditions could be added to the approved plans relating to the secondary effects of the mining. Such conditions must be reasonable and, if unacceptable to the lessee, could result in the lessee not developing the lease areas with the resultant impacts previously discussed under subsection C (4) "Reject the mining and reclamation plans."

6. ALLOW DEVELOPMENT OF SELECTED AREAS NOW UNDER LEASE

This alternative would permit only selective exploration and development on existing leaseholds, based on anticipated adverse environmental consequences. The decisionmaker has the authority and responsibility to evaluate the coal resources and impacts of mining on these leases prior to acting on the proposals. Exploration and development could be allowed only on these leaseholds, or portions thereof, that would have the lowest anticipated adverse environmental consequences. Weighing the tradeoffs of mining or precluding mining on selected tracts is part of the evaluation and decision process. Adoption of this alternative would reduce adverse effects by reducing the area in which the impacting activities could take place.

The alternative of allowing the development of only selected areas already under lease constitutes a selective application of the above. Absent a showing lease-by-lease or plan-by-plan of the likelihood of totally unacceptable environmental impacts that could not be reduced to an acceptable level, the Secretary does not possess the authority to otherwise constrain development of the leasehold if all other requirements of the lease have been met. In addition, application of this alternative would not permit maximum recovery of the coal resources and would then 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.

CHAPTER IX: CONSULTATION AND COORDINATION WITH OTHERS

A. FEDERAL AGENCIES

Bureau of Land Management, Geological Survey, Forest Service, Fish and Service, Soil Conservation Service and National Weather Service.

B. UTAH STATE AGENCIES

Geological and Mineralogical Survey, Division of Water Resources, Division of Water Rights, Division of Health, State Engineer, State Climatologist, Division of Wildlife Resources, Division of State Lands, Division of Parks and Recreation, Department of Transporation, Outdoor Recreation Agency, and Institute for the Study of Outdoor Recreation and Tourism, Utah State University, Logan, Utah.

C. COUNTY AND LOCAL GOVERNMENT

Southeastern Association of Governments

D. PRIVATE INDIVIDUALS AND ORGANIZATIONS, INDUSTRY AND NONINDUSTRY

Valley Camp of Utah, Dan Guy, Engineer, Robert Steel, Vice President and General Manager; Sanders Associates, Bob Blackett.

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.

Archeological Environmental Research Corporation, 1975, Archeological reconnaissance report - June 13, 1975: unpublished written report.

______1976, Archeological reconnaissance report - October 23, 1976: unpublished written report.

Environmental Research and Technology (ERT), 1978, Regional statement components for the southwest Wyoming coal development; environmental statement - climate and air quality section: ERT document P-3661-B.

Hagihara, U. S., Rice, C. M., and Langen, L. N., 1972, Interim guide for rating soils according to their soil suitability for rangeland seeding - Nevada: Bureau of Land Management Technical Filing Code 7312.3, 4 p.

Manti-La Sal National Forest, 1977, Traffic count records, June - October, 1977.

Mundorff, J. C., 1972, Reconnaissance of chemical quality of surface water and fluvial sediments in the Price River Basin, Utah: State of Utah technical publication no. 39, 55 p.

Pueschel R., Allee, P. Z., Wellman, D. L., Roberts, W. F., Wagner, W. W., Thoem T., 1978, Variabilities in visibility in east-central Utah: (in press).

Torgeson, D., and Carpenter, B., 1977, National Forest visual resource management system: U.S. Forest Service unpublished written report.

USDA Soil Conservation Service, 1975, Preliminary guidance for estimating erosion on areas disturbed by surface mining activities in the interior western United States: Denver, Colo., prepared for U.S. Environmental Protection Agency, Region VIII, EPA-90814-77-005, 26 p.

Utah Division of Parks and Recreation, 1976, Visitation Record - 1976.

Walker, Terry, 1977, Archeological reconnaissance report: unpublished written report.

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

Wikle, Les, 1977, Archeological reconnaissance report - August 30, 1977: U.S. Forest Service unpublished written report.

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

Deadman Canyon Mine

Lease Nos. U-010581, SL-027304, and SL-063058

Proponent: AMCA Coal Leasing, Incorporated

Site Specific Statement

AMCA Coal Leasing, Incorporated

Deadman Canyon Mine

CONTENTS

Page

ILLUSTRATIONS

TABLES

AMCA COAL LEASING, INCORPORATED

DEADMAN CANYON MINE

CHAPTER I: DESCRIPTION OF THE PROPOSED ACTION

A. INTRODUCTION

AMCA Coal Leasing, Inc. (AMCA), owns coal leases in the Deadman Canyon area of the Book Cliffs coal field and proposes to develop an underground coal mine on the property (fig. 1). The leases were originally acquired by Centennial Coal Associates, later assigned to Centennial Resources Company and subsequently to AMCA.

A plan has been submitted for approval to mine 1 million tons of bituminous coal per year (mty) from 2,242 acres of private and Federal land (fig. 2, table 1; Federal lease Nos. U-010581, SL-027304, and SL-063058). The company has also submitted plans for transportation, utilities, and other facilities needed to implement the mining plan (table 1). Some of these are off the lease area. The purpose of this statement is to analyze environmental impacts that could result from approval and implementation of the mining and reclamation plan and the associated ancillary facilities for which right-of-way applications have been applied. Future modification of the plan may require additional impact analysis at a later date.

The property is located about 10 miles north-northeast of Price, Utah, in Carbon County (fig. 1). Access is by a graveled county road that extends north from the county airport. The road was used to haul coal from now abandoned mines in Deadman Canyon.

Mining and reclamation plans were submitted by Centennial Coal Associates to the Conservation Division of the U.S. Geological Survey (GS) on May 27, 1976, pursuant to Title 30 CFR part 211. The plan was amended on January 28, 1977. On January 12, 1978, AMCA submitted a proposal to mine coal on contiguous private land (figs. 2, 3). This would preceed development of the Federal leases; however, the proposal does not change the original mining and reclamation plan as amended.

On November 5, 1976, Centennial Resources Company made application to the Bureau of Land Management (BLM) for rights-of-way over public lands for railroad, haul road, water pipeline and power and telephone lines, and indicated intent to apply also for areas to be used for mine plant, coal preparation, and waste disposal sites. Amended applications for rights-of-way were submitted on January 31, 1977, by AMCA. On January 30, 1978 rights-of-way applications were substantially revised, deleting the railroad and waterline and changing other routings. Other, minor, amendments were made on February 2 and March 30, 1978 (fig. 3). The various acts under which the applications were made are now superseded by Title 5 of the Federal Land Policy and Management Act of October 21, 1976, (90 Stat. 2776; 43 USC 1761).

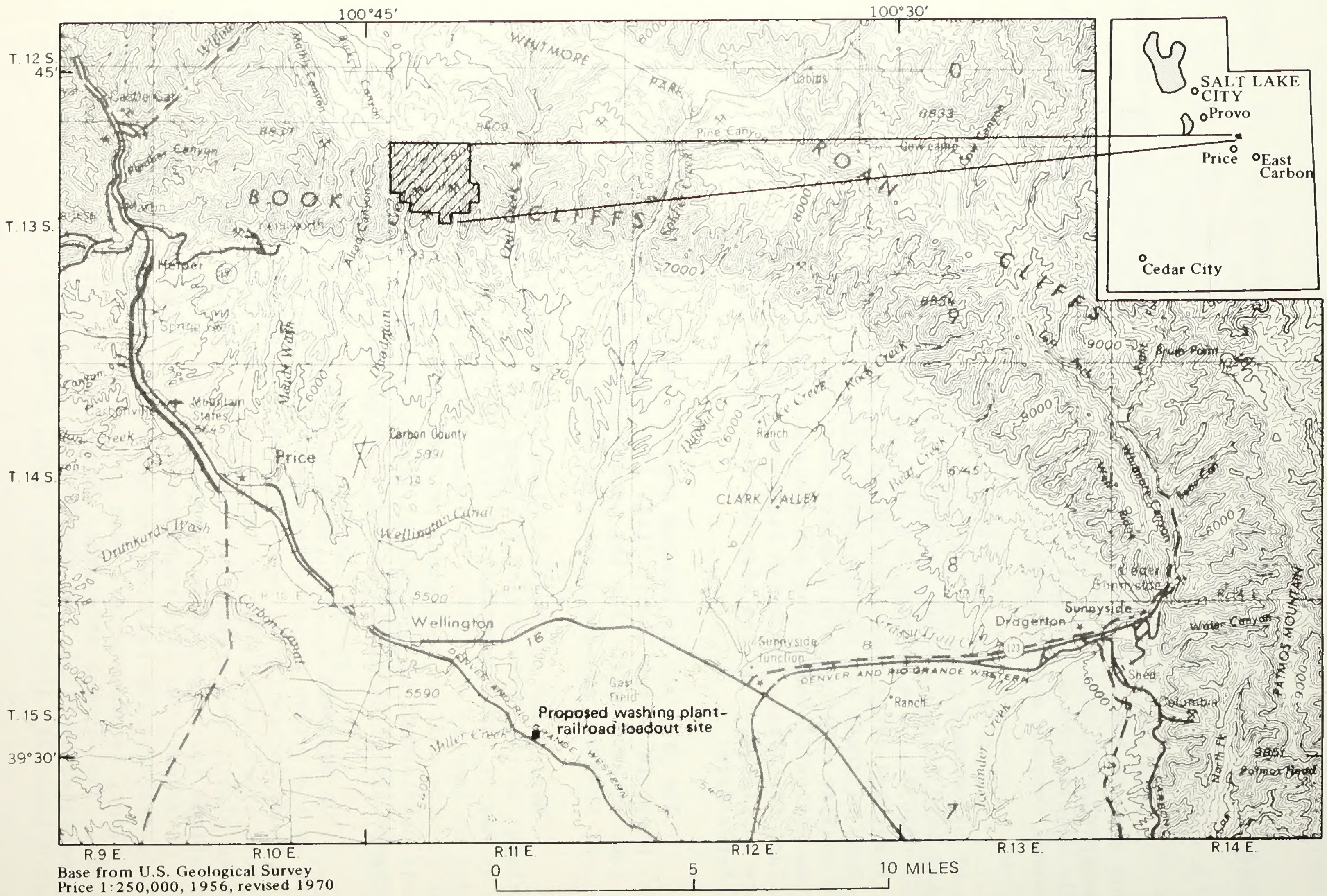


Figure 1.--Map showing location of Deadman Canyon mine property.

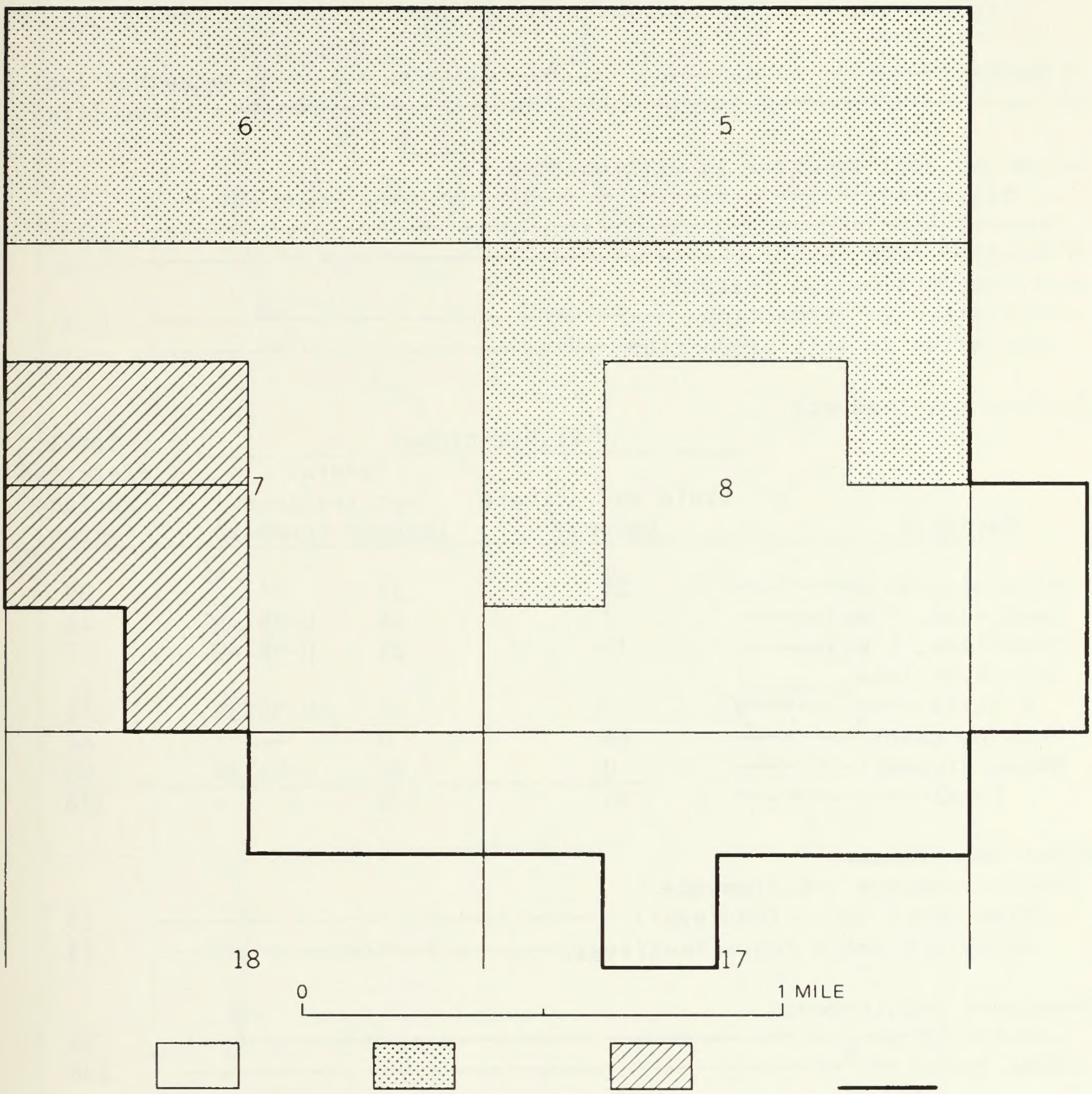


Figure 2.--Map showing surface ownership within boundaries of the Deadman Canyon mine property.

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

Mine plan area (acres)	
Federal lease	2,042
State lease	0
Private land	200
Total	2,242
Product	Washed coal
Market	Unspecified
Estimated coal reserves in million tons	
In place	50
Recoverable	29
Production rate (mty)	1
Development schedule (years)	
Initiation to production	1
Initiation to full production	4

Surface requirements

Facility	Rights-of-way: State and private (acres)	Rights-of-way: Federal applications (acres)	Rights-of-way: Federal applications (number)	Total disturbed surface (acres)
Mine plantsite	24	37	([1])	39
Haul road, 5 miles	7	46	U-36738	46
Powerline, 6 miles	14	21	U-36741	7
Telephone line, 6 miles	5	6	U-36739	([2])
Washing plant[3]	46	0	---	46
Waste disposal	0	60	U-36738	60
Total	96	170		198

Other requirements	
Major resource requirements	
Mine water (acre-feet/year)	25
Washplant water (acre-feet/year)	75
Personnel requirements	
Construction	25
Mine operation[4]	290

[1]On lease, no right-of-way required.
[2]To be buried in roadway, no additional surface disturbance needed.
[3]Private land.
[4]Based on 15 tons per man-shift including support personnel.

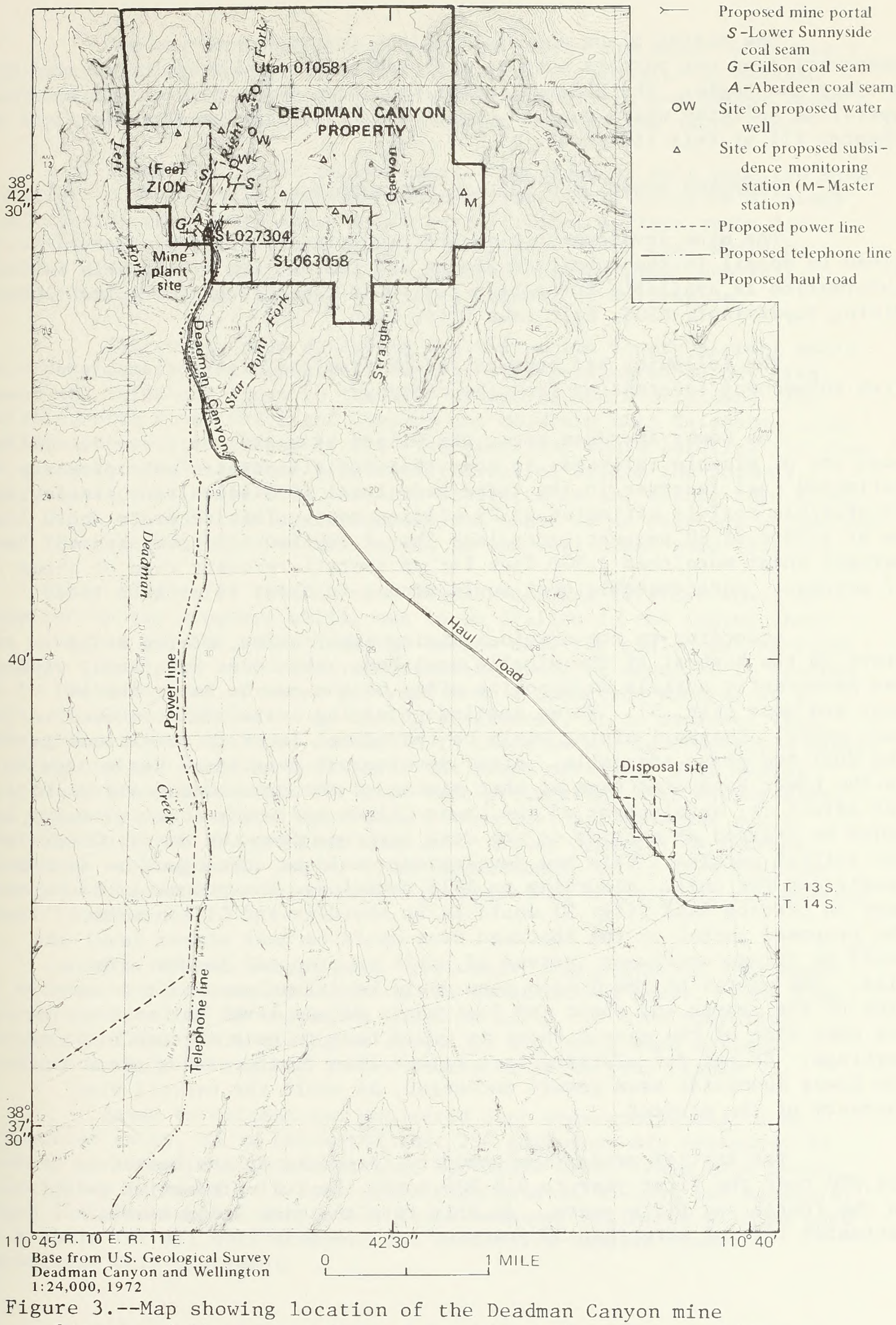


Figure 3.--Map showing location of the Deadman Canyon mine leases and the proposed mine plantsite and surface facilities.

The mining plans and applications for rights-of-way and temporary land use permits must be approved before construction of the project can begin. The Federal, State and local laws, regulations and operating policies which must be complied with are included in part I, chapter III of this statement.

B. PROPOSED MINING AND SURFACE OPERATIONS

The mine development plan and projected mining sequence is given in detail in the submitted mining and reclamation plan. This information is available for public review in the office of the Area Mining Supervisor, USGS, Salt Lake City, Utah.

The following has been extracted from the mining plans, and from subsequent information from the company.

The Lower Aberdeen seam, the Gilson seam and the Lower Sunnyside seam are of minable thickness in some, but not all parts of the property. Estimated coal reserves in the three beds total 50 million tons (table 1). Recoverable coal is estimated at 29 million tons. This recovery would be at a rate of 60 percent under less than 1,500 feet of cover and 40 percent under more than 1,500 feet for an overall recovery rate of about 57 percent. Unrecoverable coal would amount to about 21 million tons.

According to the original mining application, mining would start in the highest of the minable coal beds, the Lower Sunnyside, with two seven-entry portals on opposite sides of the canyon being driven west and east (fig. 3). Three continuous mining units would be used in each entry. Longwall mining would be introduced later if conditions in the coal bed prove adaptable. After development progresses far enough in the Lower Sunnyside seam so that mining of the two lower seams would not affect it, development of the Lower Gilson and Lower Aberdeen seams, would be started at entries on the coal outcrops down the canyon from the initial entries. This new development would be contingent on market conditions for coal. According to 1978 revisions, the proposed development on private land (fig. 3) would be in Aberdeen and Gilson seams. The proposed portal on the Aberdeen seam would be near stream level and would be driven northwest instead of north as proposed in the original plan. The portal of the Gilson seam would be driven west on the west side of the canyon and about 160 feet above stream level rather than on the east side of the canyon where it would have to pass through old mine workings. Except for starting last rather than first, mining plans for the Lower Sunnyside seam remain unchanged, as would the overall coal recovery of the project.

The initial production schedule (projects an increase from 204,000 tons the first year to 816,000 tons, the full production rate, in the fourth and fifth years. At this rate the mine would have an estimated life of more than 30 years.

Surface facilities that would be needed are shown on figure 3 and are described further in table 1. The mine plantsite in Deadman Canyon (fig. 4) would include portals on the Aberdeen and Gilson seams at the south end and on the Lower Sunnyside seam at the north end.

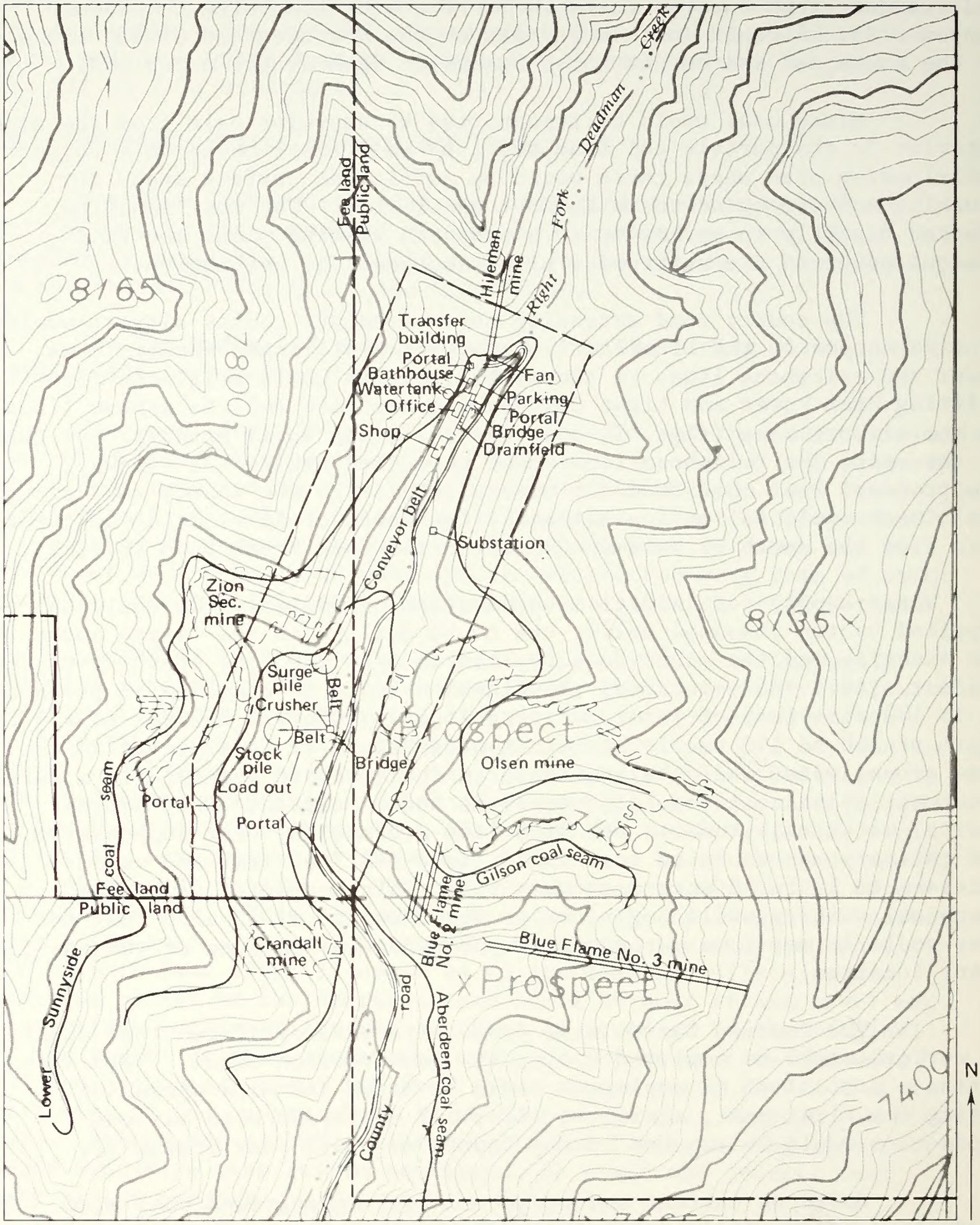
Mined coal would be transported by conveyor belt from the mine interior to the portals and from there by additional belts to a former coal-loading area where there would be sufficient surface space for crushing and stockpile-truck loadout facilities. The coal would be trucked directly to market or to a proposed washing plant and rail loadout point on the railroad 4 miles southeast of Wellington.

The county road extending north from the county airport would provide access to the minesite from the Price-Wellington-Helper area. Power and telephone lines to the mine plantsite would originate from existing Utah Power and Light Company and Mountain Bell Telephone lines in the airport area (figs. 1, 3). The powerline would parallel the road on the west; the telephone line would be buried within the roadway. The proposed haul road from the mine plantsite to the county road along Coal Creek would follow approximately the route of an existing unimproved road from the mouth of Deadman Canyon to the Coal Creek road (fig. 3).

Water supply for initial mine development and services would be supplied by two proposed wells, one to be drilled in the Canyon above the minesite and the other down the canyon near the coal crushing-truck loadout site. The well above the minesite would be expected to produce 50 to 100 acre-feet of water per year from a sandstone aquifer at a depth of 100 to 150 feet. As mining progresses, it is expected that some ground water would be available in the mine and accordingly a water treatment plant would be built near the south portals. When mining starts, water requirements for mine face protection, dust suppression, and culinary use would be less than 4 acre-feet per year and would increase to 25 to 30 acre-feet when full mining capacity is reached. When coal washing would begin, water requirements of 75 acre-feet per year would be met from water rights purchased in the area of the washing plant location.

The Deadman Canyon mine proponents have estimated that about 50 workers would be employed during the construction phase. They also estimate a total of 65 employees would be hired for mine operation during the first year, rising to about 223 employees when maximum production would be reached in the fourth or fifth year (table 1).

Based on current and projected Utah underground coal mine production rates, it is estimated that 290 employees are necessary to achieve an annual coal production of 1,000,000 tons. This work force calculation is based on a coal production rate of 15 tons per manshift, which includes support personnel. These manpower estimates will be used as a basis for all socioeconomic and work-force related comments throughout this statement.



Base from U.S. Geological Survey
Deadman Canyon 1:24,000, 1972

0 500 1000 FEET

Figure 4.--Map showing proposed layout of surface facilities at the Deadman Canyon minesite in sec. 7, T. 13 S., R. 11 E.

C. ENVIRONMENTAL PROTECTION AND RECLAMATION

The mine plan and amendment contain the following statements with regard to protection of the environment during construction and mining:

1. PROTECTION

"While grading in the mine area will be strictly controlled to prevent unnecessary defoliation, it will be required to displace sagebrush and other foliage. Also, a limited number of juniper and pinon trees will have to be removed. There is little topsoil to be moved; however, all topsoil that is removed will be stockpiled near by.

"Care will be taken to disturb as little ground as possible when installing the conveyor supports down the canyon from the mine to the preparation plant.

"A number of small culverts will be placed in the area to contain stream flow and prevent pollution in the surface area.

"As there are three coal seams of minable thickness on the leases, a systematic plan of mining will be followed to assure maximum recovery of the coal reserves. Mining will begin in the upper seam and then progress down, seam by seam.

"Since all initial mining is down dip, it is highly unlikely that any water will exit from the mine. Eventually, old worked out areas in the mine will provide a catch basin from which water will be reclaimed.

"Surface and ground water in the vicinity of the mine will be protected from pollution by coal dust and other debris by covering existing ditches where necessary.

"The mine and surface facilities will be operated within prudent standards to insure the health and safety of all employees. The facilities will be carefully inspected by company-trained safety engineers and State and Federal mine inspectors.

"Dust abatement procedures will include water dust suppression sprays and other equipment to meet dust requirements set forth under part 75--Mandatory Safety Requirements--Underground Coal Mines.

"With no effluents being emitted from the mine, it is highly unlikely that pollutants will exist. However, drainage can be controlled and diverted into small holding ponds at the mouth of the canyon to control this problem if one should develop.

"The few big red pine, white pine and fir in the upper canyon bottoms are too sparse to be cut for timber and should and will be allowed to stand. None of the mining operations will affect the pine and fir, however, some oak brush, cedar and pinon will be destroyed at the minesite.

"The gulches carrying intermittent runoff water will be left open and road crossings provided with culverts of the size shown (6 feet) so that disturbance of natural drainage will be minimal."

2. RECLAMATION

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

"Upon completion of mining activities, all equipment will be removed, the portals sealed according to existing State and Federal regulations and all buildings not being utilized will be removed.

"The area will be regraded to conform as near to original landscaping as possible. Top soil will be distributed over the graded areas and the area reseeded to establish new vegetation.

"All unnecessary roads in the area will be regraded and seeded to establish vegetation."

In addition to the above statements, the mining application contains the following reclamation plan:

a. Present Land Use

Presently the major surface use of the land is for grazing. The mine, being an underground mine, will have only a local effect on the surface. As a result, reclamation will be at a minimum.

b. Reclamation Objective

The objective here is to restore the land as near as possible to its original contour and to its original use. This can be accomplished by:

(1) Upon final mining, sealing and covering the mine openings.

(2) Removing all buildings and foundations.

(3) Grading and contouring the surface to as near original contour as possible. This includes refuse piles should they exist.

(4) Covering, where applicable, all areas with topsoil.

(5) Reseeding the area with grasses and shrubs to provide compatible ground cover in a short period of time.

(6) Roads in the area will also be regraded, have topsoil added, and be reseeded.

At the present time, there is no problem foreseen in being able to restore the area to its original use.

c. State Requirements

The requirements of the Utah State Mined Land Reclamation Act will be complied with. Copies of this application will be filed with the Utah Division of Oil Gas and Mining as required by law and, if required, an appropriate bond will be posted.

3. MONITORING

The amended mine plan makes reference to monitoring in the following statements:

"A weather station will be installed for detailed information.

"Subsidence monitoring stations will be set up with provisions for regular inspection and recordation of data as technology dictates.

"Water quality monitoring stations will be set up in the mine for identification of noxious substances. These will have to be moved as mining progresses and a gauging station maintained in the canyon to record future natural or mine discharge flows.

"Significant air quality problems are not anticipated since this is an underground operation. However, air quality monitoring stations will be set up using current technology and State and Federal standards, and qualified consultants if necessary."

D. LEGALLY ENFORCEABLE MITIGATING MEASURES

Part 1, chapter I-D discusses mitigating measures that are mandatory on operators in overcoming or reducing the adverse effects of proposed projects. Those that appear to apply specifically to the present project are discussed here.

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 and Reclamation Act (SMCRA) of 1977 (PL 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, in this statement the applicable initial regulations are considered as a required Federal mitigating measure.

The mining and reclamation plans will be returned to the operator together with a request that they be revised in accordance with the applicable initial regulations. As soon as the mining and reclamation plans are revised and returned to the Geological Survey (GS) they will be evaluated with the Office of Surface Mining to determine compliance with the requirements of Federal regulations at 30 CFR 211 and 30 CFR 700. The mining and reclamation plans cannot be approved until they conform to all applicable requirements.

1. LAND

Rockslides and rockfalls could occur in the formations above the coal outcrops when the coal is removed. The usual rate of coal recovery shall be reduced near the outcrop to avoid or reduce these occurrences to a minimum.

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 local BLM land administering office.

2. WATER

No wastes shall be placed where they will cause pollution of any waters of the State, and no waste water shall be discharged or allowed to enter any waters of the State unless it meets the water quality standards required by the State of Utah (Title 73-14-1, et. al.), the Office of Surface Mining Reclamation and Enforcement, or the Environmental Protection Agency, whichever is applicable.

If the flow or yield of any springs, streams, or wells from which water has been appropriated or which are deemed significant to the human environment, is reduced 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. In order to have the information needed to determine the effect of mining on water, the company shall be responsible for conducting an inventory of said water resources prior to mining and for monitoring the flow of springs and streams, the water level in wells, and the chemical quality of these waters during mining.

3. AIR

Each 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 should use an appropriate combination of the following fugitive dust controls:

(1) Pavement or equivalent stabilization of all haul roads used or in place for more than one year.

(2) 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.

(3) Watering of all other roads in advance of and during use whenever sufficient unstabilized materials is present to cause excessive fugitive dust.

(4) 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.

4. VEGETATION

Reclamation to restore vegetation to 90 percent of original productivity may require as much as 10 years, and, if so, it will be required. (See part I, chapter IV.)

Areas disturbed in the construction of facilities and not occupied will be revegetated to reduce erosion.

Prior to any land disturbing activities a survey for threatened or endangered plant species will be taken. Any listed species found will be protected. (see part I, chapter III, no. 7 Endangered Species.)

The land manager will have the option to require fencing of rights-of-way if this becomes necessary. Road and railroad designs will consider and the land manager may require livestock underpasses where the required drainage is large enough to accomodate such use.

5. WILDLIFE

Powerlines shall be constructed using designs approved for prevention of raptor electrocution. Fences shall be of the type specified by the BLM for use in wildlife areas.

The routes of the coal-haul road, powerline, telephone line, and railroad shall be surveyed to determine if black-footed ferrets are present. If such a survey reveals their presence, the routes shall be changed to avoid disturbing ferrets or their critical habitat.

6. ARCHEOLOGIC AND HISTORIC VALUES

The BLM and USGS entered into an agreement on July 1977 to protect the cultural resources on mineral leases. Under the agreement the BLM will be responsible for the cultural resource protection requirements for mineral leases on public lands.

The authorizing office (Bureau of Land Management) would comply with the basic 1906 Federal Antiquities Act (PL 59-209; 34 Stat. 225), the National Historic Preservation Act of 1966 (PL 89-665, 80 Stat. 915), the Historical and Archeological Data Preservation Act of 1974 (Pl 93-291), and the subsequent Federal regulations which provide legal backing and instructions for cultural resource inventory and protective consideration of sites.

The Bureau of Land Management, 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).

CHAPTER II: DESCRIPTION OF THE EXISTING ENVIRONMENT

A. NATURAL ENVIRONMENT

1. CLIMATE

The general climate of the area is described in chapter II of the regional EIS, part 1. Temperatures at the proposed site are probably 3° to 5°F cooler than at Price, 8 miles south and 1,200 feet lower. Average monthly temperatures at Price range from 25°F in January to 70-75°F in July and August. Extreme temperatures of record are -31° and 108°F. Average annual precipitation is 12 inches at the portal and may be as much as 16 inches at the higher parts of the lease area. The 100-year 6-hour precipitation is about 2 inches. Snowfall is generally light, averaging less than 33 inches annually, at Price. Potential evaporation is about 36 inches per year.

2. LAND

The Book Cliffs coal field, in which the proposed Deadman Canyon mine is located, is discussed in chapter II of the regional EIS, part 1.

a. Land Surface

The topography of the Deadman Canyon property is rugged (figs. 1, 3). The south-facing Book Cliffs are deeply dissected by box canyons of intermittent streams that also cut the pediments that slope gently away from the base of the cliffs toward the Price River. Elevations range from 7,200 feet at the portal sites to more than 8,500 feet in the northeast corner of the lease area less than 1.5 miles to the northeast. Large boulders of sandstone eroded from the cliffs are strewn over the sides of the canyon and out onto the pediments beyond the canyon mouth.

The proposed surface facilities are located on the pediment surface, mostly parallel to the courses of south to southeast-draining streams that have cut shallow courses into the pediment surface (fig. 3).

b. Geology

The main coal-bearing rocks are in the Blackhawk Formation of the Upper Cretaceous Mesaverde Group (part I, fig. II-5). Erosion-resistant sandstone in the Blackhawk and in the overlying Castlegate Sandstone and Price River Formations of the group account for the rugged topography. The North Horn Formation (Cretaceous to Tertiary in age) overlies the Mesaverde Group. The Flagstaff Formation is the highest and youngest formation in the lease area. The Mancos Shale that underlies the Mesaverde Group forms the base of the Book Cliffs and the pediment surfaces to the south but is mostly covered by colluvial debris. The regional dip of the beds is northward away from the cliff face at a uniform rate of 5 to 7 degrees. No major faults are known in the lease area, and probably only minor faults would be encountered in mining operations.

The project area has not been surveyed for paleontological resources. A general summary of the principal fossilferous formations, ages, number of known fossil localities, and general fossil types is presented in part 1, chapter II.

c. Energy and Minerals

The coal beds crop out in the Book Cliffs at elevations between 7,000 and 7,700 feet. Overburden above the coal beds in the lease area is mostly less than 1,500 feet, but in the northeast part it exceeds 2,000 feet where surface elevations exceed 8,500 feet and beds dip to their lowest elevations.

In the lease area, the Lower Aberdeen seam ranges from less than 4 to 12 feet thick, the Gilson from 2 to 7 1/2 feet and the Lower Sunnyside from 2 to 6 feet. Eight other coal beds occur but are only 6 inches to 3 feet 9 inches thick (fig. 5). Several mines, long abandoned, in the Right and Starpoint Forks of Deadman Creek (figs. 3, 4) produced coal from the Lower Aberdeen and Gilson seams, and a prospect entry was driven into the Lower Sunnyside seam in the Right Fork of Deadman Canyon near the proposed portals. Averages of analyses of coal samples indicate high volatile, low sulfur bituminous coal (table 2).

No oil or gas tests have been drilled on the Deadman Canyon property, but the rocks above and below the coal-bearing section that have produced oil and gas elsewhere in eastern Utah are present on the property. Several unsuccessful test wells have been drilled south of the property, as near as 1 mile to the boundary.

The pre-Cretaceous rocks in which uranium deposits have been found in the area of the San Rafael Swell, 40 to 50 miles to the south, are present also in the subsurface of the Deadman Canyon property, but they have not been tested by drilling.

d. Soils

Soils in the lease area are included in the Rockland (68) and Badland-Rockland (69) associations as shown on the general soils map of Utah in part 1, chapter II.

The area proposed for mining is overlain primarily by steeply sloping, canyon land (figs. 3, 6) having very stony, medium textured soils formed dominantly from sandstone. Soils on the mid to upper-slopes are shallow, with many rock outcrops present. At the toeslopes, or near the canyon bottoms, deep deposits of very cobbly and stony soils

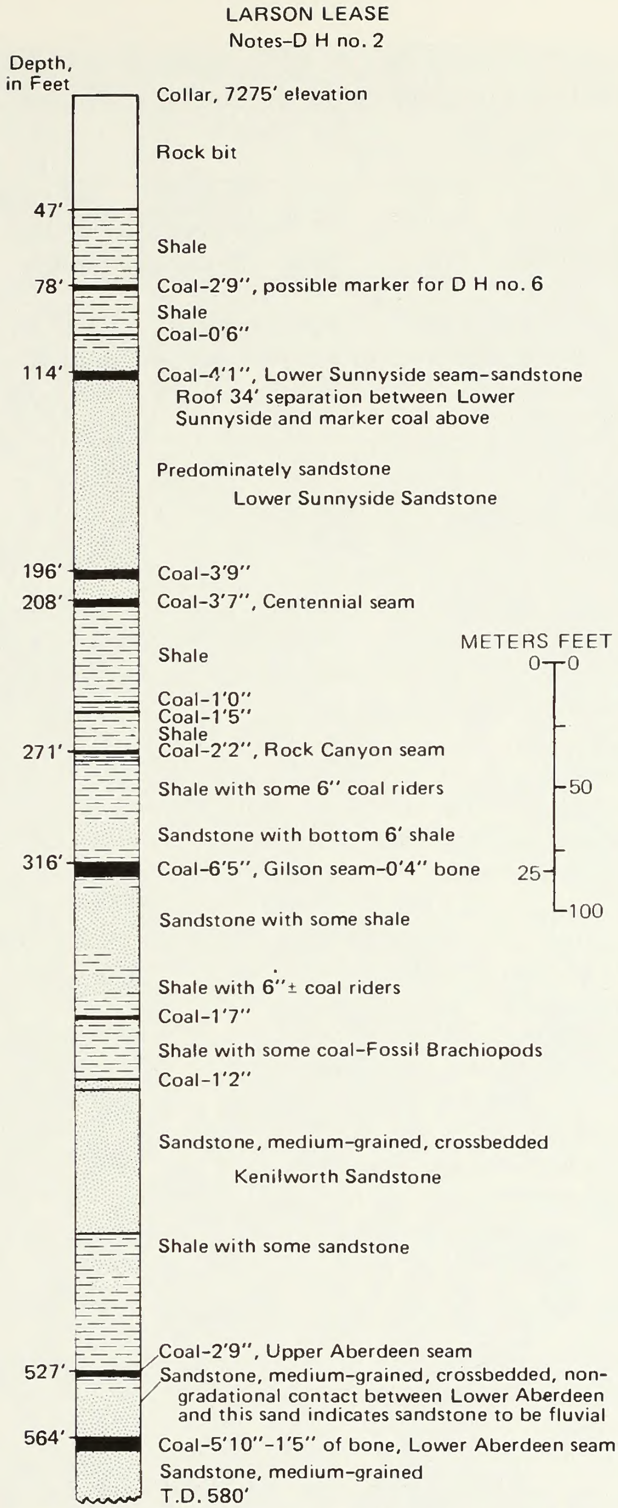


Figure 5.--Log of core drill hole about 1,000 feet north of the proposed Deadman Canyon mine portals in the Lower Sunnyside coal seam.

Table 2.--Coal analyses, Lower Sunnyside, Gilson, and Aberdeen seams

Coal bed	No. samples	Btu	Percent H_2O	Percent Volatile material	Percent Fixed carbon	Percent Ash	Percent Sulfur
Lower Sunnyside--	4	12,607	4.96	38.64	50.89	5.51	0.63
Gilson-----------	7	12,463	5.33	36.64	52.74	5.56	0.58
Aberdeen---------	11	12,708	5.08	38.16	51.56	5.20	0.67

Figure 6.--Photograph showing northward view of the Deadman Canyon mine portal site, Carbon County, Utah. The portal facilities would be in the canyon bottom in the lower half of the picture. Pinyon-Juniper woodland covers slope to the left, Streamside is along the stream channel, Conifer-Aspen with minor Mountain-Brush covers hills to right of the stream.

are present. Soils on slopes having a southerly aspect are typically lighter colored and more stony than the soils on shaded sites (northerly aspects) where better development of the surface soil is found and vegetation is more prominent (fig. 6).

Soils on the pediment slopes south of the Book Cliffs are largely formed from cobbly alluvial deposits overlying the Mancos Shale. The soils are generally loam to sandy loam in texture. Along drainages in this area the cobbly alluvium has commonly been eroded, exposing the clayey shale. Soils developed on the shale are high in soluble salts and support only salt tolerant plants. Their clayey nature and high shrink-swell potential make them poorly suited for road bases and building foundations.

3. WATER

a. Water Supply

1. Surface Water

The lease area is drained by parts of the Left and Right Forks of Deadman Canyon and Straight Canyon, all of which are tributary to the Price River. Streams on the lease area are ephemeral and flow only in response to rainfall and snowmelt. No uses are made of this water except wildlife and streamside vegetation. Surface runoff probably averages less than an inch or about 180 acre-feet per year. Judging from flow in nearby streams the chemical quality of surface water from the lease probably is good and would be expected to contain less than 500 mg/L of dissolved solids.

2. Ground Water

Sandstone beds above and within the Mancos Shale are water-bearing in the area of the mine. However, many beds commonly are dry and are partially drained of water near the cliff faces. Ground water may be perched, or impeded from deeper infiltration, by one or more layers of rock having relatively low permeability. Ground-water movement is downdip, generally north-northeastward. No springs are on the property and the nearest spring is about 1 mile north of the property boundary. Ground-water recharge is from precipitation in the vicinity of the lease area and is certainly no more than 30 to 35 acre-feet per year per square mile.

4. AIR

Particulates suspended in the air (TSP) are the only pollutants related to the mine which might make a significant degradation of air quality. Increases in other pollutants, such as sulfur dioxide, nitrogen oxides, carbon monoxide and photochemical oxidants would be negligible.

Air quality data in the air is limited. No monitoring has been done at the site. An annual average background level of suspended particulates of 20 $\mu g/m^3$ for rural locations in central Utah has been estimated (AeroVironment 1977). During periods of high wind, the short term TSP can be exceeded as a result of windblown dust.

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 demonstrated an average of 67 miles for the period September 1970 to March 1971. Average visual range calculated from particle size distribution at Bear Creek and Huntington Canyons in 1974 was approximately 45 miles.

Analysis of photographs taken at Clawson, Utah 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 have shown averages between 94 miles in November - December 1976 and 54 miles in April 1977 (Pueschel and others 1978).

5. VEGETATION

The total lease area is covered by the Mountain Brush, Desert Shrub, Pinyon-Juniper Woodland, Sagebrush-Grass, Conifer-Aspen and minor streamside vegetative types (part 1, chapt. II). The Mountain-Brush type covers more of the area than any other type. However, the Pinyon-Juniper Woodland type (fig. 6) dominates the mine mouth area; example species are Utah juniper, pinyon pine, Gambel oak, rabbitbrush, big sage, wheatgrasses, curlleaf mountain mahogany, Indian ricegrass, prickly pear, and Mormon tea. The access routes, coal haul routes and utility corridors are mainly covered with the Pinyon-Juniper Woodland type; much of this area has been reseeded to crested wheatgrass. More detailed type descriptions including a species list are located in the task force files.

No threatened or endangered plant species have been identified on the Deadman Canyon property (Welsh, 1977).

6. WILDLIFE AND FISHERIES

The West Tavaputs Plateau, which includes the area of the proposed action, supports about 360 vertebrate wildlife species (Dalton and others, 1977). Lack of perennial water in the area of the proposed mine limits use of that area by some species. Game species in the area include deer, elk, cougar, black bear, blue grouse, ruffed grouse, mourning dove, and cottontail rabbit. Small mammals, birds, reptiles, and amphibians are prey for predators such as coyote, bobcat, badger, fox, skunk, and raptors.

The proposed minesite is located in deer herd Unit 27B (Range Creek), and most mine-related facilities would be on areas designated as deer winter range. Unit 27B has 573,824 acres of winter range available for deer use in normal winters and 371,776 acres in severe winters (Utah Fish and Game Dept., 1967). Winter range is the limiting factor on deer population in this unit, and the area in the mouth of Coal Creek Canyon has been designated as critical deer winter range by the Utah Division of Wildlife Resources (Scott and others, 1977). The Division estimates that available vegetation on winter range in Unit 27B could support 29,885 deer annually (written commun., L. Wilson, 1977). The Pinyon-Juniper type will support .09 deer per acre; however, the area of Pinyon-Juniper that has been reseeded with grass and browse species has an estimated carrying capacity of .08 deer per acre. The access road, haul road, powerline, and telephone line routes would pass through reseeded areas.

The minesite and coal haul route are within the lower limits of elk range, however, elk are generally at higher elevations on the Book Cliffs, north of the proposed minesite.

Cougar range throughout the area; their movements are closely associated with the seasonal distribution of deer which are their primary food source. No population data are available for cougar in Utah, but harvest figures indicate an increasing population trend. During the 6-year period 1971-1977, Unit 27B ranked highest in the State with 37 cougar taken (Fair, 1977a).

Black bear inhabit the Book Cliffs north of the proposed minesite and may occasionally visit the vegetated canyons along the face such as Deadman Canyon. Seasonal movements of bear are generally dictated by food availability (Skinner, 1925; Amstrup and Beecham, 1976). Home areas are usually linear--oriented up and down slope (Jonkel and Cowan, 1971). Data are not available on black bear populations, but Utah harvest figures rank Unit 27B second highest in the State with 31 bear taken during the 11-year period, 1967-1977 (Fair, 1977b).

Mourning doves and cottontail rabbits are generally distributed throughout the area of the proposed sites for the mine and ancillary facilities. The lack of permanent water limits dove nesting habitat in the area. Blue and ruffed grouse inhabit the area above the proposed mine, and may occasionally be found in Deadman Canyon.

A survey conducted by the Utah Division of Wildlife Resources (UDWR) failed to locate any threatened or endangered wildlife species on or near to the leasehold or access routes (Boner, 1977). An adult American peregrine falcon was seen in February, 1977, approximately 16 miles southeast of the proposed minesite. This sighting is outside the known and suspected breeding distribution of the peregrine falcon in Carbon County (Porter and White, 1973) and the minesite does not contain suitable nesting habitat for this species. A known bald eagle roost is located approximately 13 miles west of the minesite. During the winter of 1976-77, nine bald eagles an endangered species were recorded at that roost site (Boner, 1977). The area crossed by the present access road and the proposed routes of the telephone line, powerline, and railroad has been identified as potential habitat for the endangered black-footed ferret (Scott and others, 1977). The UDWR study indicated there were no direct observations or substantial signs of black-footed ferrets in any areas checked but concludes that any developments in areas containing prairie dog populations should be carefully surveyed for black-footed ferret (Boner, 1977).

There are no permanent bodies of water or perennial streams in the area that support fish or aquatic fauna.

B. CULTURAL ENVIRONMENT AND LAND USE

1. LANDS

Most of the lands within the Deadman Canyon property are public lands with the surface and mineral rights administered by the BLM (fig. 2). The April 1977, Management Framework Plan published by the BLM, allows for mining and requires the following stipulations for mining operations in this area: all facility authorization must include stipulations to meet BLM standards (detailed in the BLM Manual 2800) for minimal impact. All leases and ancillary facilities related to the leases must develop visual resource management objectives.

Carbon County zoning ordinance, adopted May 19, 1959, and subsequent amendments place the Deadman Canyon mine proposal, including Federal and private leases, within a mining and grazing zone. The mining and grazing zone use requirements provide for "open-pit mines and mine waste dumps and underground mines and 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."

2. RANGE AND TIMBER

Cattle graze the project area from April 15 to May 31 and from October 16-31 each year. Sheep also graze the area from January 16 to February 28 each year. The cattle use for the entire allotment amounts to 562 head for 1,131 AUM's (Animal Use Month; 1 cow grazing one month) while the sheep grazing totals 2,100 sheep for 420 AUM's. These livestock are grazed under a two-pasture rotation system. The total allotment area contains 24,494 acres of which 10,320 acres are Pinyon-Juniper Woodland, 8,230 acres are Sagebrush-Grass and 5,944 acres are Desert Shrub. Approximately 3,860 acres of the Pinyon-Juniper Woodland type have been changed to Grassland and reseeded to crested wheatgrass.

A few junipers are harvested for posts, pinyon nuts are picked, and chaining residues (dead trees) are cut for firewood.

3. ENERGY AND MINERALS

No energy or mineral resources are being produced at present on the Dugout Canyon property. During various periods from 1925 to 1964, the Gilson seam was mined in the Rio Grande (Olsen) mine on the east side of Deadman Canyon and in the Zion mine on the west side (Doelling, 1972, p. 272, 391) (fig. 5). The Aberdeen seam was mined in the Crandall mine (fig. 5) but more extensively in the Blue Flame No. 1 and Starpoint (Sutton) mines in Starpoint Fork (fig. 3). The estimated combined coal production from these mines ranges from 474,000 to 978,000 tons.

4. SOCIOECONOMICS

About 18,000 people live within commuting distance to the proposed mine.

The regional socioeconomic structure is primarily related to mining activities. Its residents, particularly in Price, are of many ethnic and racial backgrounds. This region is rather unique in that the general population is so cosmopolitan yet relatively isolated from other larger urban and cosmopolitan centers. Farming and agricultural activities are part-time occupations. Established residents express a high sense of community pride and happiness with their homes and friends (Geertsen and others, 1977).

5. TRANSPORTATION AND UTILITIES

Most of the traffic in the area is generally northwest-southeast US 6 or over the Denver and Rio Grande Western Railroad (fig. 1), the main routes between the Salt Lake City-Provo area and Denver. Immediately east of Wellington, US 6 carried an average of 4,400 vehicles per day in 1975, 335 of them heavy trucks.

An average of 650 vehicles per day, 45 of them heavy trucks, traveled the Price Airport road (fig. 1) as far as the airport in 1975; beyond the airport toward the proposed minesite traffic dropped off to 35 vpd.

US 6 is a two-lane asphalted highway. The road to the Price Airport also is asphalt and two lane, though to lower standards for 4 miles. The remaining 6 miles is graveled or graded but otherwise unimproved. Another low-grade asphalted road traverses Coal Creek valley (fig. 1).

The nearest railroad is the D&RGW main line at Wellington.

A Utah Power & Light transmission line is along the north side of the Price Airport; power is available from that point. Telephone service also is available from the airport area.

6. ARCHEOLOGIC AND HISTORIC VALUES

Little is known archeologically of the lease area and vicinity although some work has been done in the region (Pierson, 1977). These investigations have resulted in the recording of many archeological sites in neighboring areas, 10 to 100 miles from the proposed mine.

A reconnaissance survey of the lease area was done by K. K. Pelli of Moab, Utah, in September of 1977 (Pierson, 1977). This preliminary examination did not locate any archeological or historical sites. The National Register of Historic Places lists no cultural sites in this area.

7. RECREATION

No developed recreation services or facilities exist within or adjacent to the proposed mine. The area lacks water, significant variety, and recreation user attractions and is not well suited for developed or long-term destination type recreation use.

Because of its close proximity and ready access to Price, Wellington, and Helper, short-term heavy use is made of the Price Airport-Deadman Canyon road and adjacent land areas. Activities and use include driving for pleasure and viewing the environment, target shooting, hunting (small game, game birds, and mule deer), and picnicking. Primitive roads between Deadman Canyon and Coal Creek receive moderate use by four-wheel drive vehicles and the deteriorating hard surface road in Coal Creek receives light use, primarily for pleasure driving, target shooting, and hunting.

8. ESTHETICS

The land surfaces would not be seen from the only major travel route (US 6). From this vantage point the area has the appearance of a natural landscape, and would be classified as common in scenic quality to the surrounding landscape.

Existing and cultural modifications of the natural landscape, as viewed on-site, are extensive. Residues and structural remnants from past mining in Deadman Canyon create an abandonded and somewhat despoiled appearance. Roadsides along the Airport-Deadman Canyon road are littered and include a number of industrial developments. Considerable evidence of off-road vehicle use and parking exists along the asphalt portion of this road.

Pinyon-Juniper stands between Deadman Canyon and Coal Creek have been eradicated by chaining. Much of the downed pinyon-juniper still exists and several low standard roads transect this same area. Modifications in the Coal Creek drainage include a deteriorating paved road, irrigated farm lands, and utility lines.

Scenic quality as viewed on-site is low and the proposed area of use has a low sensitivity to viewing and additional modification. Visual Resource Management has allowed maximum modification in the past. Present objectives also provide for modification of the natural landscape character, but with emphasis on location of developments and activities to enhance the visual resource of disturbed areas and blend with the remaining natural landscape.

The location of the proposed construction camp in the mouth of Deadman Canyon, except for the low standard access road, is undisturbed. It is more sensitive to viewing and modification than the remainder of the proposed area of use, because of the natural landscape character at the area.

C. FUTURE ENVIRONMENT

The Deadman Canyon mine area was used in the past for coal mining and vestiges of this prior use still exist. The future of the mine area and communities that would contain the work force would be very much the same, whether or not this particular mine is developed.

CHAPTER III: ENVIRONMENTAL IMPACTS

A. NATURAL ENVIRONMENT

1. LAND

Chapter IV of the regional EIS, part 1, discusses various adverse impacts that mining projects in the central region would generally be expected to have on the land surface and on the energy and mineral resources.

a. Land Surface

The 198 acres needed for surface facilities is based on individual rights-of-way for access and utility routes; the total area requirements would be reduced somewhat by grouping roads, etc. into corridors. The degree of surface disturbance would vary, and the amount of earth that would be moved is not estimated in the mine plan (table 1).

Subsidence could affect all of the property surface except along the coal outcrops in the Book Cliffs where all three seams are mostly less than a current economic minable thickness of 4 feet. Because of the large and abrupt variation in overburden thickness and rather abrupt variation in thickness of the coal beds themselves, an overall estimate of the surface subsidence that might occur cannot be calculated. However, based on the mining plans which show mining panels 500 feet wide and up to 6,000 feet long, and using information developed by Dunrud (1976, fig. 20) for the Somerset mine in Colorado (where the rock section is of similar age but contains fewer thick sandstone beds), maximum subsidence would be about 70 percent of the thickness of the mined coal bed. For a single 6-foot thick coal bed, subsidence could amount to as much as 4.2 feet, but if all three minable coal beds of this thickness were mined in one place, the maximum subsidence could total 12 feet or more. The three beds are not of minable thickness over the entire property.

b. Paleontology

Impacts to paleontological resources would consist of losses of plant, and invertebrate, and vertebrate fossils for scientific research, public education (interpretative programs), and amateur collectors. Losses would result from destruction, disturbance or removal of fossils as a result of mining, unauthorized collection, and vandalism. The extent of impact cannot be assessed because of lack of data.

Because of the present 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.

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 fossiliferous formations within the region could also be affected by unauthorized fossil collecting and vandalism as a result of increased regional population. The extent of this impact cannot be presently assessed due to a general lack of specific data on such activities.

c. Energy and Minerals

Present plans and mining methods would leave approximately 21 million tons of coal in the Lower Sunnyside, Gilson, and Aberdeen seams under overburden ranging to more than 1,500 feet in thickness. Additional unestimated amounts of coal would be left where these and other coal beds are thinner than 4 feet (fig. 5). In the estimated 30-year life of the mine, improved technology may increase the recovery of the coal that is now considered unrecoverable.

d. Soils

Leveling for construction would require extensive cutting into sideslopes (fig. 6), and possibly result in some rockfall and small slides. Erosion would increase throughout the construction areas, especially during the construction period when the soil is exposed to wind and rainfall. Some site damage would likely occur even though the intent in the mine plan and mitigations is to control erosion.

Construction of the haul road from Deadman Canyon to the county road along Coal Creek would have the greatest surface impact (46 acres) related to the project. Most of the route would be on cobbly alluvial soils which are suited for road construction, however, the Mancos Shale would be encountered where cuts are necessary along this route. The shale is highly erodible, has poor revegetation potential, and has a high shrink-swell potential. Road maintenance would be difficult, as would preventing erosion of cuts and fills.

2. WATER

a. Water Supply

The proposed action would impact water supplies. Annual water requirements could total 480 acre-feet--25 at the mine, 30 for dust suppression, 75 for washing coal, and as much as 350 for the domestic needs of increased population in nearby communities. Sewage effluent could increase by as much as 175 acre-feet per year.

1. Surface Water

Subsidence and subsequent cracking of the material overlying the mine may cause some surface runoff to be diverted into the ground, but the quantity of water that might be diverted, if any, cannot be predicted. The maximum amount that could be diverted would average 180 acre-feet total runoff per year, but actual diversions would likely be much less, perhaps none. Water that is diverted into the ground probably would be discharged again, but potential points of discharge cannot be predicted from available data.

2. Ground Water

Any water use, and mining below water-bearing sandstone beds might alter availability of ground water. Water levels might be lowered locally; ground water above mined beds might drain into and increase the water content in sandstone beds below the mined units.

3. AIR

a. Suspended Particulates

Dust from truck haulage of coal andfrom auto travel on unpaved roads would be the major source of TSP associated with the mining activities. Another source of TSP would be coal particles at coal handling sites. However, because of the large size of coal particles, most would fall out within the first 0.6 mile downwind of the mine.

AeroVironment (1977) modeled 24-hour average TSP concentrations resulting from auto and truck traffic on what they considered a typical unpaved road network. Applying their analysis to traffic associated with the Deadman Canyon mine, it is estimated that 24-hour TSP concentrations of 20 $\mu g/m^3$ above background could occur near the haul road. To put the TSP level into perspective, the secondary NAAQS (which does not necessarily apply, as indicated in part I, chapter III) is 150 $\mu g/m^3$. Incremental increase in TSP along the airport road would be 28 $\mu g/m^3$. A 50 percent reduction in emissions was assumed because of watering.

Total annual potential emissions from the mines (coal storage and transfer) and fugitive dust from truck haul and auto and supply vehicle travel on the unpaved road would be an estimated 2,600 tons (40 tons from mining activities and 2,560 tons from truck haul, supply trucks, and auto traffic on an unpaved road).

b. Visibility

Visibility would be significantly impaired nearunpaved roads because of suspended particulates. The impact would be confined mainly to periods of heavy traffic.

4. VEGETATION

The main impacts would be caused by the mine mouth facilities, the access road, and the other easements needed to support the operation. As much as 150 acres of Pinyon-Juniper and 48 acres of the reseeded Grassland would be destroyed. Little or no impact is foreseen on the vegetation overlying the underground workings.

No threatened or endangered plant species would be impacted by the proposal.

5. WILDLIFE

If the proposed action were implemented, a direct loss 198 acres of deer winter range (0.04 percent of the total on unit 27B) would result from construction of facilities. Proposed facilities would occupy 48 acres in the reseeded Grassland and 150 acres in the Pinyon-Juniper. Loss of this habitat would reduce the deer population potential by 17 deer annually until facilities are removed and the area restored to its present condition.

Disturbance from construction and operation of the proposed mine would reduce deer use by 50 percent on an additional 1,472 acres of deer winter range surrounding the proposed project. This area would extend outward 0.1 mile from the periphery of the disturbance centers at the mine portal, disposal site, and roads. The avoidance reaction would be total at the disturbance source, and gradually decrease as the distance from the source increases. The disturbance would affect use on 776 acres of Pinyon-Juniper and 696 acres of reseeded Grassland. The reduction in use on this range would decrease the deer population potential by 63 deer annually. This impact is short-term and would continue for the life of the mine.

The total deer population potential that would be lost annually is 80 deer.

The loss of deer winter range and the disturbance would effectively reduce the range for cougar in the area. Based on the size of home ranges and the overlapping home ranges of adult male and female cougars (Seidensticker, and others, 1973), the proposed mine would reduce the cougar population potential in unit 27B by two animals.

Destruction of mountain brush and disturbance would cause black bears to avoid the mine area. This avoidance reaction may not result in a direct reduction in bear numbers, but it would reduce the home range of one bear, and limit reproductive potential (Jonkel and Cowan, 1971; Rogers, 1976).

Reconstruction of a road in a relatively undisturbed wildlife area and an increase in traffic would result in increased vehicle strikes and loss of wildlife. This would be a continuing hazard for deer during winter months as they move daily between feeding and cover habitat. High speed traffic on the proposed coal-haul road, or the mine-access road would result in some loss of deer. The amount of this loss cannot be quantified because of lack of data, but it would increase over the average loss of 5.6 deer annually on herd unit 27B during the period 1970-1977. A hazard would also be created for scavenging birds and animals that would be attracted to the roadway to feed on road-kill victims. Raptors in the area that would be most susceptible to vehicle strikes include bald and golden eagles, rough-legged hawks, and great horned owls. The extent of raptor losses cannot be predicted.

Any mine water discharge or creation of open water would allow mourning dove nesting in the vicinity and enhance the habitat for blue and ruffed grouse. Creation of a usable perennial water source in the area would be a positive impact for all wildlife species.

Construction of powerlines to the mine would provide hunting perches for raptors in an area of few tall trees. This would be a positive impact; however, the presence of the lines would introduce additional hazards such as wire strikes and exposure to illegal shooting. The number of raptors and other birds that would be lost cannot be determined.

Any increase in population owing to the proposed mine would result in increased pressure on game species. Demand for legal harvest of fish and game would increase, and illegal activities related to protected wildlife species would also increase. The urbanization resulting from the population influx might reduce available wildlife habitat by as much as 102 acres (406 single family dwellings, four to the acre). If the total acreage were agricultural land and pheasant habitat it would result in a potential loss of 12 hens and four cocks.

B. CULTURAL ENVIRONMENT AND LAND USE

1. RANGE AND TIMBER

The vegetation destroyed by the project would reduce the grazing capacity by 14 AUM's for both sheep and cattle. The access and haul roads would cause an impact by restricting the use of range by the livestock. The mine and support facilities would occupy as much as 1 percent of the grazing allotment area. Agricultural lands elsewhere might be reduced by conversion of the land to urbanization and the irrigation water to public supply (regional EIS, part 1, chapter IV).

2. SOCIOECONOMICS

It is estimated that the proposed mine could add as many as 1,250 to 1,800 new residents to the region. This is about 20 percent of the population at the projected production level discussed in part 1.

The population distribution cannot be accurately predicted but most new residents probably would live near Price (fig. 1).

Greatest impacts would be due to increased urbanization and the need for and development of additional permanent or mobile housing, need for and construction of additional school space, and changes in existing community services. The increased community services would require taxation and bonding of local residents (or perhaps county or state-wide residents) to construct, operate, and maintain such services as sewers, water, streets, garbage collection, police, fire, and public health services.

Beneficial impacts anticipated are higher average incomes, and an expanded business economy in Carbon County.

3. TRANSPORTATION AND UTILITIES

Both the county access road and a low-grade county road south of US 6 would have to be improved for heavy truck traffic to a washing plant and rail loading terminal on the Denver and Rio Grande Western Railroad mainline southeast of Wellington (fig. 1).

At a production rate of 816,000 tons per year, a unit train of 96 85-ton cars would be loaded about every 2.7 working days (260 work-days per year).

About 155 25-ton truckloads of coal per workday would pass along the haul road between the minesite and the washing plant-railroad loading terminal, a truck passage on the average of every 6 minutes over a 16-hour day. Other mine traffic would be expected to pass along this route, as would a small amount of other traffic over public portions of the way.

Employees of the mine and washery could be expected to add about 272 vehicle passages per day to local roads. Commuters from Price would find it convient to use the Price Airport road to the mine. Commuters from Wellington and points east at least initially would find it more convenient to take the paved Coal Creek valley road and the private haul road to the mine. In the absence of population distribution information, it is impracticable to predict the percentage of miners using either road.

Some additional traffic hazards would result from increased use of present roads.

4. ARCHEOLOGIC AND HISTORIC VALUES

No sites were found, during Pelli's cultural resource survey; however, sites may be found during intensive surveys that will be made prior to development. Until such survey is completed the extent of the impact cannot be determined. Increased population because of mining may result in more vandalism of archeological and historical sites in the region. Improved access may also result in increased vandalism to sites that may be present. No known National Register properties would be impacted. Surveys will add to the cultural resource knowledge of the region.

5. RECREATION

Increased traffic along the Price Airport-Deadman Canyon road would reduce the desirability of the area for present recreation uses by introducing more traffic, congestion, dust, and noise. It could also introduce some safety hazards to all users of the road and immediate roadside areas.

Mine facilities and activities within lower Deadman Canyon would eliminate or substantially reduce the opportunity for most types of recreation use now taking place in the canyon. The area between Deadman Canyon and Coal Creek, along the proposed truck haul route, could become more accessible to all types of motor vehicle traffic. This could result in greater hunting pressures and, subsequently, lower hunter success. Indiscriminate use of off-road vehicles could increase, along with littering and vandalism, throughout the area involved in the proposed action.

6. ESTHETICS

Existing and proposed modifications of the natural landscape would be viewed primarily on-site and would not be visible or seen with clarity from any major travel route or viewing area. Impacts would accrue from the addition of more industrial facilities and activities to an already modified landscape and from the introduction or increase in dust and noise.

The additional facilities and activities involved in this single proposal would not create significant impacts on the visual resource, if properly designed and located, because of existing modifications and intrusions. However, significant cumulative adverse impacts to the visual resource could occur and are described in the regional EIS, chapter IV.

CHAPTER IV: MITIGATING MEASURES

Approval of the proposed action will include requirements for mitigating measures to eliminate or minimize the adverse impacts described in chapter III. The operator is committed to those mitigating measures proposed in the mining plan as described in chapter I-C and is subject also to other enforceable mitigations as described in chapter I-D. Other mitigations and alternatives are described in chapter VIII.

CHAPTER V: ADVERSE EFFECTS THAT CANNOT BE AVOIDED

A. NATURAL ENVIRONMENT

1. LAND

The adverse effects on the land surface as the result of the construction of surface facilities and waste disposal would not be totally mitigated by the proposed reclamation measures at the end of the mining operations, but nearly all the land could probably be returned to its previous uses. In the undermined area of the coal leases, however, the resulting subsidence and potential for subsidence would create hazards to possible uses involving surface construction, even though previous use of the land for grazing and hunting would not be affected.

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.

The overburden is too thick for the coal to be recovered by any present method other than underground mining, but an estimated 43 percent of the minable coal must remain unrecovered in pillars and barriers that provide roof support and fire protection in the mining operations. Additional unestimated amounts of coal would be left where beds are thinner than 4 feet (fig. 5).

Soils on as much as 198 acres of land would be affected by disturbance and (or) removal of vegetation by activities associated with the proposed action. This would result in some increased soil erosion and possible reduction in soil productivity.

2. WATER

The increased use and consumption of water for coal mining and attendant peripheral uses cannot be avoided. Annual needs for water could total 480 acre-feet.

Mining below water-bearing beds might lower ground-water levels locally. Ground-water flow patterns in the mine area would be altered.

3. AIR

With paving of roads, the maximum 24-hour TSP incremental increase would be approximately 60 $\mu g/m^3$, which is significantly below secondary NAAQS. Visibility would not be significantly impaired near the paved roads.

4. VEGETATION

Vegetation would be removed from as much as 198 acres in constructing the facilities serving the mine. This will result in a loss of 14 AUM's of grazing capacity per year. Some disruption of the normal grazing patterns for domestic livestock will occur. A small volume of fuelwood and fence posts may be salvaged prior to construction, but they would not be replaced (re-grown) until some years after mining ceases.

5. WILDLIFE AND FISHERIES

About 198 acres of deer winter range would be eliminated for the life of the mine (short-term). Reduction of deer use would occur on an additional 1,472 acres. Loss of wildlife to vehicle strikes and loss of raptors or other birds due to illegal shooting or wire strikes is unavoidable. Loss of wildlife or reduced wildlife productivity due to loss of habitat, harassment, urbanization, and illegal hunting cannot be avoided.

B. CULTURAL ENVIRONMENT AND LAND USE

1. SOCIOECONOMICS

Major adverse impacts would be indirect social impacts owing to shortage of housing, and taxation and bonding to underwrite costs to operate and maintain increased community and county services within the subregion and Carbon County area.

2. TRANSPORTATION AND UTILITIES

The direct impact to roads and utilities would mainly be beneficial, in that low-grade roads would be improved. The movement of 816,000 tons of coal per year would result in adding more than 230 commuter vehicles per day to the affected county roads, 250 passages per work day by 25-ton trucks over private and (or) county roads, with consequent commitments of energy and capital, with adverse effects on vegetation, wildlife, and the human environment, including traffic safety. Incidental service-truck traffic is estimated to be about 33 vpd, adding to the total traffic flow. This is about 10 times the present traffic in the area north of Price Airport.

3. ARCHEOLOGIC AND HISTORIC VALUES

Increased population in the area may result in vandalism to archeological and historical sites within the region. Any direct impacts cannot be determined until intensive surveys are completed.

4. RECREATION AND ESTHETICS

The remote, unoccupied character of the proposed truck-haul route between Deadman Canyon and Coal Creek would be lost during the life of the project. Use of Deadman Canyon for mining activities would partially exempt recreation uses and activities in the canyon. Recreation use along the Price Airport-Deadman Canyon road would be partially curtailed or eliminated and some loss would accrue to hunter success in the area.

Some increases in dust and noise would be associated with increased activities during construction and the life of the mine.

Mining facilities and activities, regardless of mitigating measures taken, would still result in additional modifications of the landscape character of the area as viewed on-site.

CHAPTER VI: SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The proposed Deadman Canyon mine would have a life of about 30 years in an area with a long history of mining. Implementation of this mine would imply an increase in coal production from the region but would not produce other significant changes.

The disturbance of 198 acres of land for operating facilties and access routes (table 1) would interrupt but probably not change the long-term use or productivity of the land from its present use for grazing and hunting. Surface subsidence and potential subsidence above the undermined area of about 2,200 acres may restrict long-term use that would involve the building of surface structures.

Implementation of the mine proposal would impact an undetermined number of uninventoried exposed and unexposed fossil localities, and result in an unknown gain in knowledge of paleontological resources because of exposure which might never have occurred without excavation.

In the short term, vegetation including the range forage and forest/woodland products would be lost to the project. In the long term, following reclamation, these areas should be as productive as they are now.

Soils disturbed would be taken out of production and used for mining purposes during the short term. During mining, soil productivity would be lost on 198 acres of land disturbed by mining activities. Some disturbed sites that are suitable for seeding would be revegetated shortly after disturbance, so they would be out of production for only a very short period of time.

Reclamation of the area after mining has terminated would return the land to at least 90 percent of its original productivity.

If facilities such as the haul road remain in place, the long-term wildlife productivity of the area occupied would be eliminated. Offsite urbanization would eliminate long-term productivity of wildlife on those areas occupied. Increased access due to improved roads would create a long-term disturbance of wildlife that would result in decreased population potentials.

The short-term use of the area for coal mining would alter deer migration and use patterns. This change in habits would continue for an indefinite period beyond the life of the mine. Such alteration may result in an unbalanced use of available range, and a lowered productive potential.

Community and county tax base and resident acreage incomes would increase during the proposed mine's economic life. Rural economic programs would decrease during this time, especially in the number of residents directly employed full time in agriculture.

Because the local communities and subregion would become economically dependent on this proposed mine, it is conceivable that some local communities could become economically depressed when the mine eventually closes or suffers any major market setback.

The transportation aspects of the proposal are not likely to have great impacts on the long-term use of the land involved. County roads already exist; after upgrading, they would occupy somewhat greater area and may be realigned somewhat. They would remain after mining is over. The haul road would provide a connection between two county roads, completing a loop. Probably the haul road would remain. If additional development takes place in the area, the telephone and powerlines would be left to serve other customers; otherwise, the lines would be salvaged for their materials and the rights-of-way vacated.

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 insure recording of information that could otherwise be lost to natural forces or vandalism.

Short-term use for mining and associated activities would displace some recreation uses, along the Price Airport-Deadman Canyon road and in Deadman Canyon, such as hunting and target shooting. The area would be available for these same uses after mining and reclamation. Improved access could increase recreation use of the area between Deadman Canyon and Coal Creek on a long-term basis.

Additional modifications of the landscape character would be evident during the life of the mine. After reclamation, the area would basically return to its present condition, except for improved access. On a long-term basis, reclamation in Deadman Canyon and leaving improved access in place could enhance the esthetic character of the area.

CHAPTER VII: IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The 29 million tons of coal that would be mined from the Lower Sunnyside, Gilson, and Aberdeen seams over the life of the project would be consumed as nonrenewable energy resources. About 21 million tons must remain in place as pillars, fire walls, and other roof support. This and unestimated amounts of coal where these beds thin to less than 4 feet, and coal in other beds in the section that are of less than minable thickness (fig. 5), will remain as irretrievable resources unless and until methods can be developed to recover them.

Impacts might occur to an undetermined number of uninventoried exposed and unexposed fossil localities.

Soil amendments and energy input needed to rebuild the soil to its approximate original condition on the disturbed sites may be considered irretrievable.

Any soil lost by erosion as a result of this project would be irretrievable.

Disruption of ground water flow patterns resulting from subsidence would be irreversible.

Water used for public and industrial purposes would be diverted in use, and would not be available for other uses except for that discharged as sewage effluent (175 acre-feet per year), which could be reclaimed. The maximum estimated use of 350 acre-feet per year of water by the increased population may be irreversible if the people choose to stay on past the life of the mine.

Termination of coal mining operations would lead to a termination of pollutant emissions. Thus the air resource would not be irreversibly commited as a result of the mine operation. Emissions from secondary growth and related activity such as traffic, urban fuel consumption, etc., induced by the proposed action would be more permanent in nature and result in a long-term commitment of the air resource to some deterioration.

The vegetative resources would be irretrievably lost for the life of the project. The grazing capacity would be reduced by 14 AUM's per year for 30 years (total 420 AUM's). A small volume of forest/woodland products would also be lost.

Any loss of wildlife or wildlife productivity would be irretrievable. The loss of wildlife habitat due to urbanization and retention of facilities would be irreversible.

Roads left after mining and reclamation would irreversibly commit the area to increased traffic and recreation use. The remote, unoccupied character of the Deadman Canyon-Coal Creek area would be irretrievable as long as improved access existed in the area.

The esthetic resource would not be irreversibly or irretrievably committed for the long term. Improved access would allow more people to view the area on site. This commitment could be retrieved at any time after mining by obliterating and reseeding access and haul roads.

Of materials committed to the utilities, only salvage value would remain. An undetermined amount of time and equipment would be committed to supplying the mine and miners by truck. A substantial but undetermined amount of time, fuel, other supplies, and vehicles would be committed to the commuting of miners back and forth to work. These are irretrievable commitments of resources during the operating life of the mine. Truck haul of 816,000 tons of coal per year to a washing plant-load out near Wellington would require about 300,000 gallons of diesel fuel. Since the eventual market of the coal is not known, the energy needed to operate the train is not computed. A typical unit train fuel efficiency is about 300 ton-miles per gallon.

Any cultural resources in the immediate project area could not be preserved in place.

CHAPTER VIII: ALTERNATIVES

Chapter VIII of part 1 includes references to administrative, technological, and energy source alternatives on a regional basis. Considered here are alternatives that apply to the development of the Deadman Canyon property.

A. NO ACTION

Pursuant to implied covenants of both the Federal mineral leasing laws and the existing lease agreements, the Secretary is obligated to respond to a legitimate application to conduct mining operations on a valid lease, provided that all terms and conditions thereunder have been met. His response may be approval as proposed, rejection on various legitimate grounds, approval in part and rejection in part, or approval subject to such additional conditions and requirements or modifications as he may impose under the laws. He may also defer decision, based on proper grounds, as described elsewhere in this chapter.

"No action" on proposals for continuation of approved ongoing mining operations would equate to closing down existing operations; under existing regulations, operations may not proceed in the absence of approved mining plans and related permits. The impacts of taking no actions in such cases would be approximately the same as those described under the following subsection C (2), "Cancel the leases."

"No action" on mining proposals for the initial development of existing leases would equate to maintaining the status quo on those leases. The impacts of taking no action in these cases would be the same as described subsequently under subsection C, "Prevent further development on existing leases."

The coal that would be mined on the Deadman Canyon property would be used for an unspecified market, probably for powerplant fuel. If the application to develop the property were denied, the company would probably seek to develop coal resources elsewhere. The anticipated environmental impacts would thus be shifted to another area, possibly one less favorable economically and environmentally than the Price, Utah, area where coal mining is a long-established industry.

B. DEFER ACTION

For proper cause, the Secretary may defer final action on a proposed mining and reclamation plan. These could include, but are not limited to, the need and time required for:

1. Modification of the proposal to correct administrative or technologic deficiencies.

2. Redesign to reduce or avoid environmental impact.

3. Acquisitions of additional data to provide an improved basis for technical or environmental evaluation.

4. Further evaluation of the proposal and (or) alternatives.

The principal effect of deferring action on a proposed mining and reclamation plan on these grounds would be a comparatively short-term delay in the imposition of all related impacts of the proposal as previously described in the unavoidable adverse impacts section of this statement.

Once a mining and reclamation plan is approved, the regulations and lease terms require that all subsequently proposed departures and deviations therefrom be approved in advance by the USGS. The regulations (30 CFR 211) also permit the USGS to direct that changes be made in previously approved operations. For example, changes could be ordered to accommodate new, improved, or revised administrative requirements, technologic improvements, environmental concerns or requirements, or revisions of prior evaluations thereof in the light of experience or previously unknown factors.

The company is proceeding with plans to begin mining on fee land in July 1978 in the two lower of the three minable coal beds, and presumably delay in approving the application to mine coal on the Federal leases will not affect this beginning and would cause loss of financial resources.

C. PREVENT FURTHER DEVELOPMENT ON EXISTING LEASES

The only alternatives to allowing development of existing leases is to prevent such development or to impose additional conditions and restrictions on the operations. The several apparent means of preventing full development are discussed below.

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, other comparable quantities of coal or sources of energy would be required to meet national needs. The development of other sources and related impacts is discussed later.

1. 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, and future suspensions of operations for reasonable periods, with proper grounds, could be imposed. The Secretary cannot, under present circumstances, suspend operations to the extent that a de facto 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 operations pending legislation remains available. Impacts of this alternative would be similar to those described in subsection C (2), "Cancel the leases."

2. CANCEL THE LEASES (NO NEW DEVELOPMENT)

The Secretary does not possess authority to unilaterally cancel the leases except on the ground defined therein (section 7 or 8 of the lease terms--"Proceedings in case of default"). The authority to cancel on other grounds would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees as may be necessary. The Administration has not entered a request for such legislation, and the Congress has not initiated such action in 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 non-environmental concerns.

Present production could be interrupted temporarily or terminated completely, as could further development of all existing leases.

To the extent that coal production from existing leases was curtailed or halted, alternative sources of energy would be required to meet present needs and demands. These could be foreign and (or) domestic and are discussed in later pages. The time required to replace the resource foregone could range from scant to a number of years, depending on the specific alternative(s) selected and its state of production.

Environmental impacts of the proposals could range widely, depending on the administrative action taken on existing leases. If these leases were cancelled through Congressional authorization, proposed mines would be avoided. Conversely, should development eventually be authorized, environmental impacts as discussed in the impact chapter would occur. The net result would be a deferral and perhaps reduction of impacts through changed technology or requirements imposed at that time.

3. FEDERAL ACQUISITION OF LEASES

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 under subsection C (2).

4. REJECT THE MINING AND RECLAMATION PLANS

Rejection of the proposed mining and reclamation plans would result in no environmental impact on the leased lands, and they would continue in their present condition, subject to modification by natural process and by the condition of other existing activity and uses--and to further modification by the surface owner to meet other uses.

The Secretary may reject any individual proposed activity 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 designed course of action by the lessee (operator). 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 Congress. Viability of this option is dependent upon timely legislative action; the option of rejecting the proposed plans pending legislation remains available. Impacts of this alternative would be similar to those described under subsection C (2), "Cancel the leases."

D. RESTRICT DEVELOPMENT ON EXISTING LEASES

The subject leases convey the right to develop, produce, and market the Federal coal resource thereof if all other terms and conditions have been met by the lessee. In general, the Secretary does not possess the authority to arbitrarily constrict development. 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.

Thus, under present conditions, a general effort to restrict or regulate development of existing leases 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.

E. APPROVE THE MINING PLAN AFTER MODIFICATION

A number of the impacts identified and described in chapter III of this statement could be more fully mitigated by the selective application of those measures described that are supplemental to the proposals of the AMCA Coal Leasing, Incorporated, or by implementation of one or more of the alternatives described below. In addition, special conditions could be added to the approved plans relating to the secondary effects of the mining. Such conditions must be reasonable and, if unacceptable to the lessee, could result in the lessee not developing the lease areas with the resultant impacts previously discussed under subsection C (4) "Reject the mining and reclamation plans."

An examination of the vicinity will be made to determine if black-footed ferrets may occur. If ferrets are found, consultation may be required with the U.S. Fish and Wildlife Service under the provisions of section 7 of the Endangered Species Act (P.L. 93-205).

Powerlines should be separated from roadways by at least 300 yards to reduce the indiscriminate shooting hazard of perching raptors.

Proper design and reconstruction of present county roads to meet anticipated increased traffic would reduce inconvenience and danger on the county roads involved. Providing adequate warning and traffic signs also would help.

Dust problems created along haul roads can be minimized by hard surfacing or water sprinkling. Dust also will be a problem on the Price Airport road, which should be paved to reduce fugitive dust and improve the safety of the road.

Use of the haul road from Deadman Canyon to Coal Creek could be restricted to mine-related traffic only. This could reduce some impacts such as hunting pressure, user conflicts, and safety problems.

Some loss of wildlife due to vehicle strikes would be expected on the haul road. The amount of this loss cannot be quantified, but it would not limit long-term productivity or species affected. Wildlife losses and loss of hunter success could be mitigated to some extent by restricting haul traffic to daylight hours during winter months when animals use the area as winter range.

Displaced use, such as target shooting, could be accommodated by the establishment of a shooting range in the general area. This could be done through existing permit systems to local service clubs or local government entities.

Mitigation of impacts to the visual resource could include the designing and placement of structures in seldom seen areas, and in painting some structures to match those of the surrounding vegetation and geological formations. Cleaning up of old mining residues, trash, etc., from previous mining activities in Deadman Canyon would improve the visual characteristics of this area. Reseeding of cut and fill slopes concurrent with construction and development activities would also help maintain a more pleasant visual character throughout the impact area.

If any archeological 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).

F. ALLOW DEVELOPMENT OF SELECTED AREAS NOW UNDER LEASE

This alternative would permit only selective exploration and development on existing leaseholds, based on anticipated adverse environmental consequences. The decisionmaker has the authority and responsibility to evaluate the coal resources and impacts of mining on these leases prior to acting on the proposals. Exploration and development could be allowed only on these leaseholds, or portions thereof, that would have the lowest anticipated adverse environmental consequences. Weighing the tradeoffs of mining or precluding mining on selected tracts is part of the evaluation and decision process. Adoption of this alternative would reduce adverse effects by reducing the area in which the impacting activities could take place.

The alternative of allowing the development of only selected areas already under lease constitutes a selective application of the above. Absent a showing lease-by-lease or plan-by-plan of the likelihood of totally unacceptable environmental impacts that could not be reduced to an acceptable level, the Secretary does not possess the authority to otherwise constrain development of the leasehold if all other requirements of the lease have been met. In addition, application of this alternative would not permit maximum recovery of the coal resources and would then 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.

CHAPTER IX: CONSULTATION AND COORDINATION WITH OTHERS

A. FEDERAL AGENCIES

Bureau of Land Management, Geological Survey, USDA Forest Service, Fish and Wildlife Service, Soil Conservation Service, and National Weather Service.

B. UTAH STATE AGENCIES

Geological and Mineralogical Survey, Division of Water Resources, Division of Water Rights, Division of Health, State Engineer, State Climatologist, Division of Wildlife Resources, Division of State Lands, Division of Parks and Recreation, Department of Transportation, Outdoor Recreation Agency, and Institute for the Study of Outdoor Recreation and Tourism, Utah State University, Logan, Utah.

C. COUNTY AND LOCAL GOVERNMENT

Southeastern Association of Governments.

D. PRIVATE INDIVIDUALS AND ORGANIZATIONS, INDUSTRY AND NONINDUSTRY

Centennial Coal Associates, James Quigley, General Partner and Proffessional Engineer, AMCA Resources Company, W. Keith Smith, Manager, Mike Walton-Clark, Chief Engineer of Luscar Ltd., Tom Griffing, Environmental Consultant of International Environmental Consultants, Ltd., Samuel C. Quigley, Senior Geologist.

Vaughan Hansen Associates, Salt Lake City, Utah.

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.

Boner, T. C., 1977, Final report - Endangered and unique terrestrial wildlife species within the coal study area: Utah State Division of Wildlife Resources report to Bureau of Land Management on contract no. YA-512-C26-257.

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 inhabits southeastern 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.

Fair, Jeffrey S., 1977a, Utah cougar harvest, 1976-77: Utah State Div. of Wildlife Resources pub. no. 77-10.

______1977b, Utah black bear harvest, 1976-77: Utah State Div. of Wildlife Resources pub. no. 77-9.

Geertsen R., Loney, M., and Yun Kim, 1977, Local perceptions of community life in rural Utah: Utah Science, June, 1977, p. 46-51.

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

Pierson, L. M., 1977, Report of archeological activities - Deadman Canyon coal lease: prepared for K. K. Pelli Co., 12 p.

Porter, R. D., and White, C. M., 1973, The peregrine falcon in Utah, emphasizing ecology and competition with the prairie falcon: Brigham Young Univ. Science Bull., Biological series, v. XVIII, no. 1.

Rogers, L., 1976, Effects of mast and berry crop failure on survival, growth, and reproductive success of black bears: North American Wildlife Conference transactions, 41(1976), p. 431-438.

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

Skinner, M. P., 1925, Bears in Yellowstone: Chicago, Illinois, A. C. McClurg and Co., 158 p.

Utah Fish and Game Department, 1967, Utah big game range inventory, 1966: pub. no. 67-1.

Utah Division of Wildlife Resources, 1977, Utah big game investigations and management recommendations, 1977: pub. no. 77-5.

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

Fish Creek and Dugout Canyon Mines

Lease Nos. U-0144820, U-07746, U-089096, U-092147,

U-07064, and U-027821

Proponent: Pacific Gas and Electric Company

Site Specific Statement

Pacific Gas and Electric Company

Fish Creek and Dugout Canyon Mines

CONTENTS

Page

ILLUSTRATIONS

Page

TABLES

PACIFIC GAS AND ELECTRIC COMPANY

FISH CREEK AND DUGOUT CANYON MINES

CHAPTER I: DESCRIPTION OF PROPOSED ACTION

A. INTRODUCTION

Pacific Gas and Electric Company (P.G. & E.) and Kennecott Copper Corporation (KCC) own coal leases in the Sage Point and Dugout Canyon areas, respectively, of the Book Cliffs coal field (part 1, regional EIS, chapter 2), and propose to have Natural Gas Corporation of California (NGC), a P.G. & E. subsidiary, develop and operate an underground coal mine on each property. P.G. & E. has submitted plans for approval to mine 3.2 million tons per year (mty) from about 10,000 acres of Federal, State and private land (Federal lease Nos. U-0144820, U-07746, U-089096, U-092147, U-07064, and U-027821). The purpose of this statement is to analyze environmental impacts that could result from approval and implementation of the mining plan and associated ancilliary facilities for which right-of-way applications have been applied. The coal mined will supply needs for one of two proposed 800 MW coal-fired electric generating plants to be built in P.G. & E.'s service area of northern California by 1985. The coal will also supply KCC's metallurgical and power generation needs in Nevada and Utah.

The properties are about 15 miles east-northeast of Price, Utah in Carbon County (fig. 1). A gravel-surfaced haul road extends 9 miles northeast from Soldier Creek Road (formerly U-53) to the Dugout Canyon site where coal was mined from 1957-65 (fig. 2). The Fish Creek minesite on the Sage Point property is 2 miles west of Dugout Canyon and is accessible by jeep road.

P.G. & E.'s coal leases include 7,468 acres, 5,852 on all or part of six Federal leases, 976 on three State mineral leases, and 640 on fee land (fig. 2). KCC's leases at Dugout Canyon adjoin the Sage Point property on the east and include 2,576 acres, including 2,416 on Federal leases, and 160 on fee land. Figure 3 shows surface ownership in the two property areas.

Mining and reclamation plans were submitted to the U.S. Geological Survey on November 3, 1976 in accordance with Title 30 (Mineral Resources) CFR part 211 (Coal Mining Operating Regulations). Natural Gas Corporation of America, the designated operator, has applied to the Bureau of Land Management (BLM) for rights-of-way and special land-use permits for several purposes under a variety of Acts since superseded by Title 5 of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776; 43 USC 1961) (table 1).

The mining plans and the applications for rights-of-way and special land-use permits must be approved before construction of the project can begin.

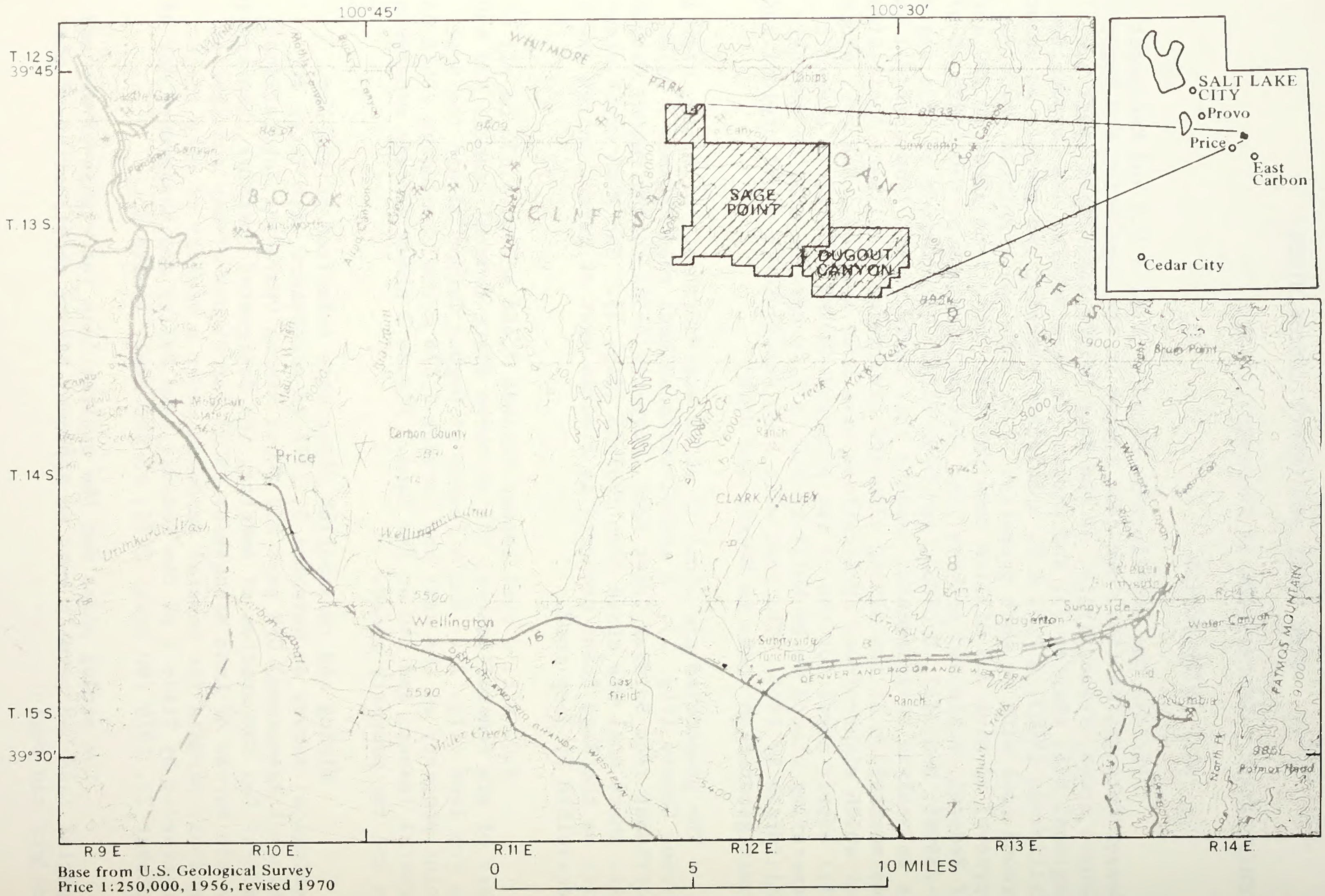


Figure 1.--Location of Pacific Gas and Electric Company's Fish Creek-Dugout Canyon properties, Carbon County, Utah.

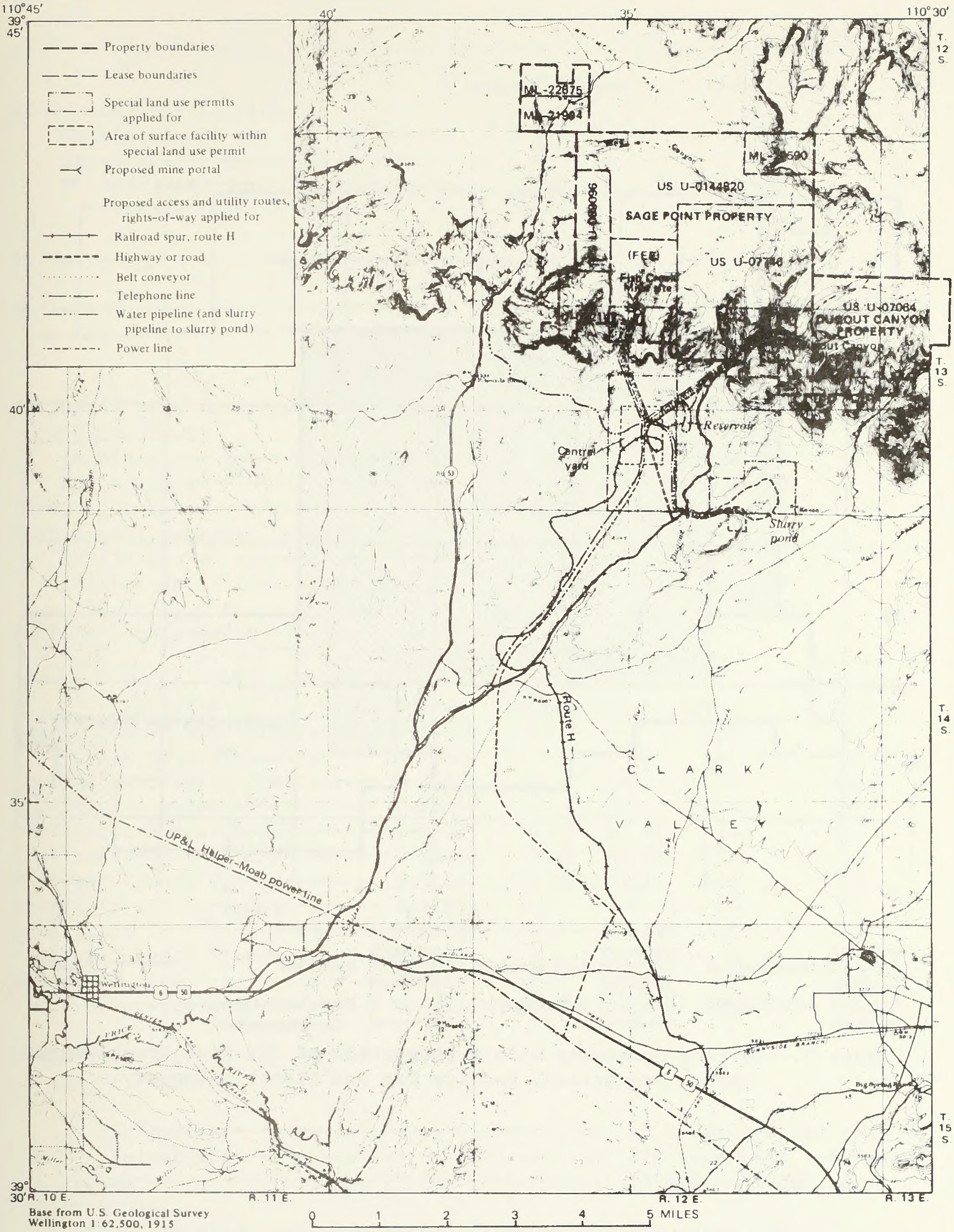


Figure 2.--Map showing Fish Creek and Dugout Canyon coal properties and proposed surface facilities.

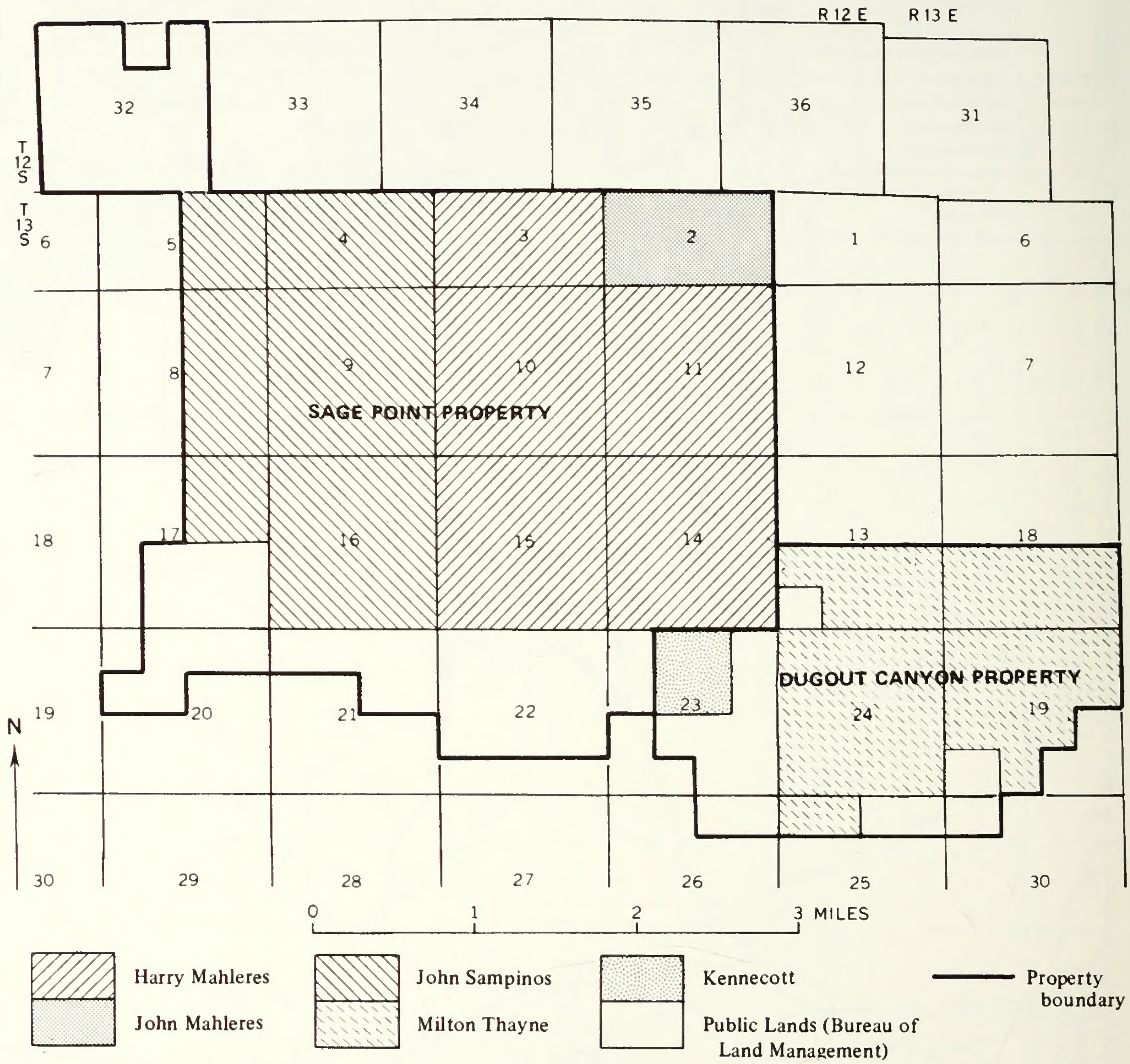


Figure 3.--Surface ownership within boundaries of the Fish Creek-Dugout Canyon properties, Pacific Gas and Electric Company.

Table 1.--Summary of mining and reclamation and ancillary facilities

Mine plan area (acres)	Dugout Canyon mine	Fish Creek mine
Federal lease	2,416	5,852
State lease		976
Private land	160	640
Total	2,576	7,468
Product	Washed coal	Raw coal
Market	Proposed P.G. & E. generating plant in northern California, and KCC power and metallurgical needs in Utah and Nevada.	
Estimated coal reserves (million tons)		
In place	80	142
Recoverable	40	71
Production rate	0.9 mty	2.3 mty
Development schedule (years)		
Initiation to production	2	2
Initiation to full production	8	8

Surface requirements

Facility	Federal land applications: Number	Miles	Width	Acres	Surface disturbance (acres)
Dugout Canyon mine plantsite	U-35689	---	---	400	32
Fish Creek mine plantsite	U-35689	---	---	160	18
Central processing plantsite	U-35689	---	---	1,280	360
Slurry pond site	U-35689	---	---	560	221
Overland conveyors	U-35687	4	50 ft	24	12
Haul roads	U-35688	5.4	60 ft	39	39
Railroad (route H)	U-35681	13.5	100 ft	163	163
Reservoir	U-35682	---	---	24	24
Waterlines	U-35683	8.4	25 ft	25	25
Tailings slurry line	U-35684	2.2	25 ft	7	7
Telephone line	U-35685	10.0	40 ft	48	13
Electric powerlines	U-35686	13.7	75 ft	125	18

Other requirements
Major resource
Water
Culinary---------------------------------- 42 acre-feet per year
Industrial-------------------------------- 378 acre feet per year
Lime-- 18,000 tons per year
Personnel
Mine operation and processing plant-------- 950 ----- [1]930

[1]Based on 15 tons per man-shift including support personnel.

B. PROPOSED ACTION

The mine development plan and projected mining sequence is given in detail in the submitted mining and reclamation plan. This information is available for public review in the office of the Area Mining Supervisor, USGS, Salt Lake City, Utah.

The following has been extracted from the mining plans and subsequent information from the company.

Coal production in Dugout Canyon is proposed from the previously mined Gilson and Rock Canyon beds in the Blackhawk Formation of Late Cretaceous age. A third bed, the Sunnyside, is also of minable thickness (4 feet or more) in the Sage Point property and would be mined concurrently with the Rock Canyon bed. The interval between the Gilson and Rock Canyon beds is 30 to 100 feet, and that between the Rock Canyon and Sunnyside beds 130 to 180 feet. The beds have been explored by core drilling and by measuring sections along outcrops.

Over the proposed mining area, the Sunnyside bed ranges from less than 4 to more than 12 feet in thickness, including partings and bone coal; the Rock Canyon bed from less than 4 to 10.5 feet; and the Gilson bed from less than 4 to more than 16 feet. The beds thin or thicken rather abruptly in some places. The three beds crop out in the Book Cliffs at altitudes of 7,200 to 7,800 feet and dip north-northeastward toward the Uinta basin uniformly at 6° to 7°. Overburden ranges from 0 to more than 3,000 feet, but is mostly less than 2,500 feet.

Analyses of coal (dry basis) in cores are reported by the proponent to average of 13.8 percent ash, 35.9 percent volatile material, 47.8 percent fixed carbon, 0.6 percent sulfur, and 12,405 Btu's per pound.

Estimated coal reserves in the Sage Point property total 142 million tons. Incomplete drilling data on the Dugout Canyon property indicate 80 million tons in the Gilson and Rock Canyon beds. At an expected annual production of 3 million tons and estimated recovery of 50 percent, the total reserves of 222 million tons would last for 37 years. Figures on reserves and expected initial production are given in table 1.

The proposed Fish Creek mine would have a single-entry rock tunnel starting at or below the lowest minable bed (Gilson) and driven parallel to the dip on a 2 percent plus grade. The tunnel would intersect all three minable beds in 1,800 feet. This tunnel would provide access to the two upper beds, with track haulage for men and supplies and an overhead belt conveyor above a steel divider to carry coal out of the mine. Other entries would be driven from inside the mine to the outcrops for the ventilation system. Later mining of the Gilson bed would start from an adit on the coal outcrop about 700 feet southwest of the rock tunnel portal.

At the Dugout Canyon minesite, adits to the Gilson and Rock Canyon beds would be directly on the coal outcrops, avoiding the previously-mined areas to the north and east. All portals on coal outcrops would have a minimum of four entries to provide for haulage way and ventilation. Belt conveyors would be used for moving coal and track haulage for men and supplies.

Coal from both mines would be brought by belt conveyors to a central yard to be cleaned and loaded on unit trains for shipment to California, Nevada, and places in Utah.

The 6-year initial production schedule for the Fish Creek mine calls for concurrent development of the Sunnyside and Rock Canyon beds. Production would increase rapidly in the Sunnyside bed, with longwall mining being added in the fifth year. A total of nine continuous- and longwall-mining units would be operating by the end of the sixth year. Mining of the Rock Canyon seam would be at a relatively steady rate with two continuous mining units. At the Dugout Canyon mine, coal production from the Rock Canyon bed would increase steadily, with four continuous and longwall units in operation by the end of the fifth year. Development of the Gilson bed would not start until the fifth year.

Possible geologic hazards include roof falls, methane seepage, and water flooding. Roof bolting and adequate ventilation would be used to minimize the first two. Water flooding has not been a problem in other mines of this area.

The proponent has applied for Special Land Use Permits for 2,400 acres of public land on which to locate surface facilities (table 1).

The Fish Creek plantsite is in a narrow canyon, which would require extensive excavation along the sides to provide the required level area (figs. 4 and 5). Major excavation would be on the east side of the canyon. The course of Fish Creek would be shifted as much as 100 feet westward over a distance of about 600 feet.

Much less preparation for the Dugout Canyon plantsite would be required, as the canyon is wider and the site has been used for previous mining (figs. 6 and 7).

The central yard site, on essentially flat ground southwest of the Book Cliffs, would require some leveling where crossed by minor streams (figs. 8 and 9).

Present roads from US 6 to the mining area consist of the Soldier Creek County road 10 miles of bituminous surfaced road, 9 miles of improved graveled road to the old mines in Dugout Canyon, and 4 miles of unimproved dirt road to the Fish Creek minesite. The company has filed right-of-way applications for the 4 miles of haul-road from the

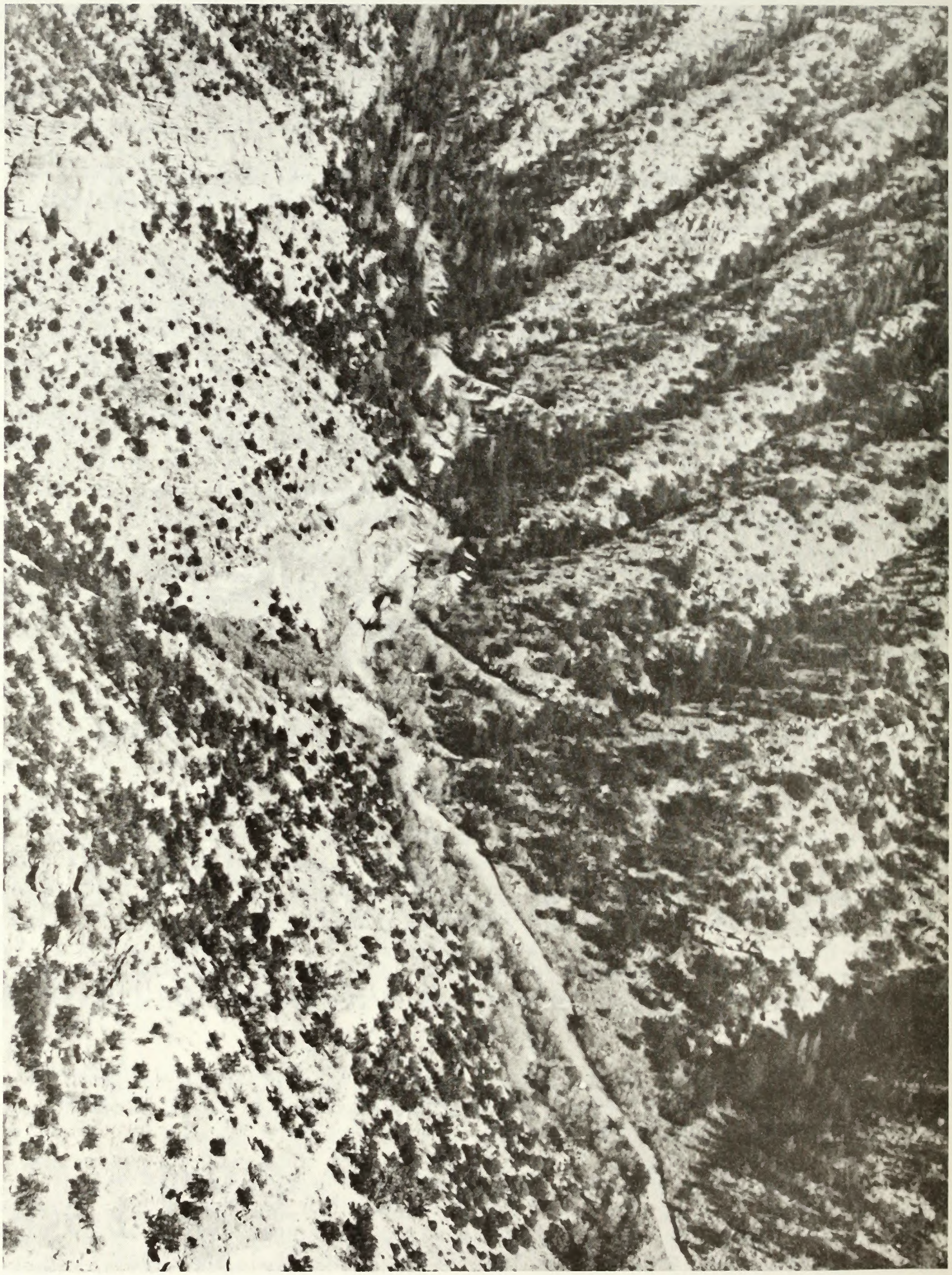


Figure 4.--Photograph showing proposed portal area in Fish Creek, Carbon County, Utah. The portal facilities would be in the center of the photograph and include the areas cleared of vegetation.

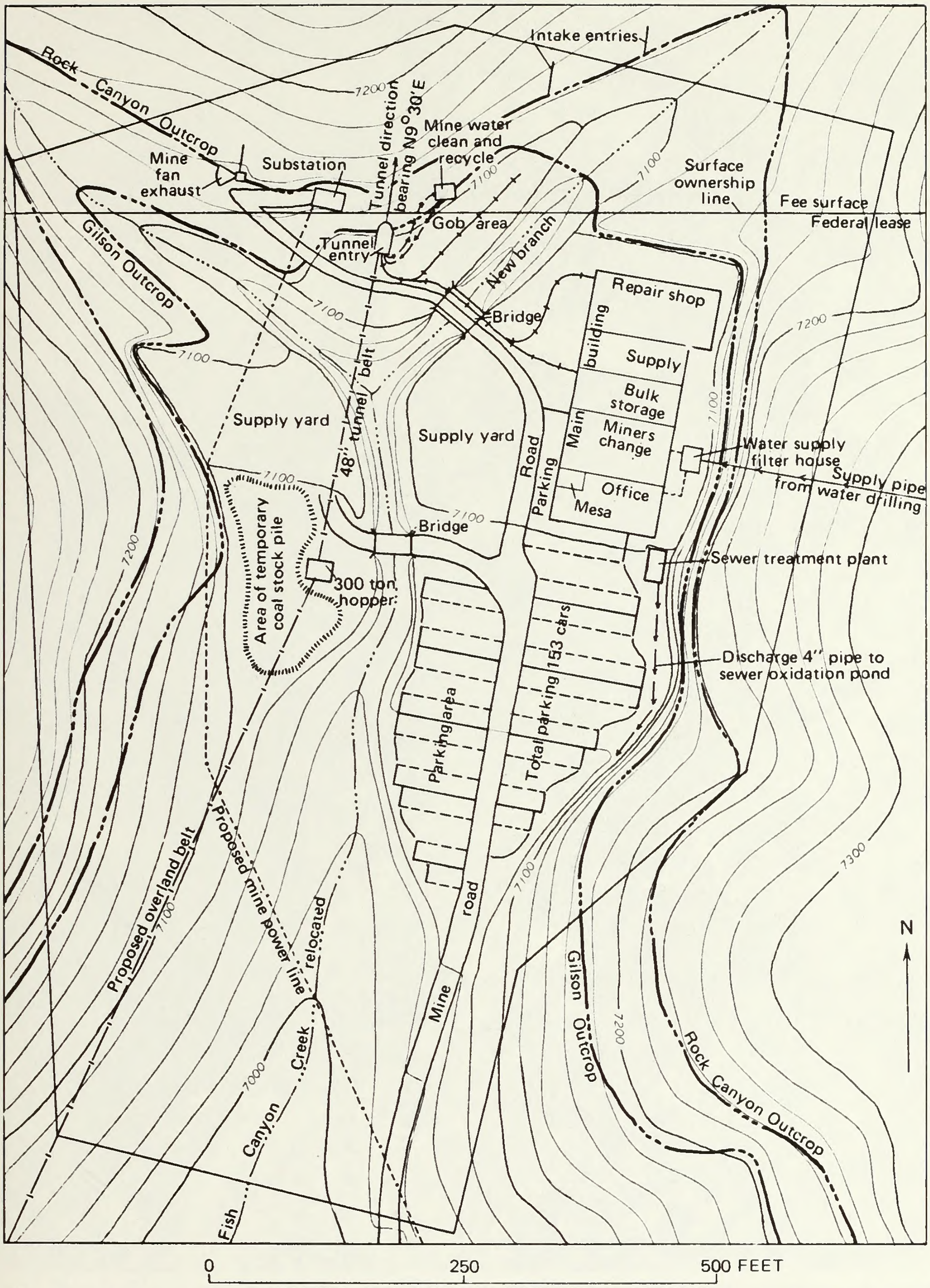


Figure 5.--Proposed layout of surface facilities at the Fish Creek minesite in sec. 21, T. 12 S., R. 13 E., showing final topography after site preparation.

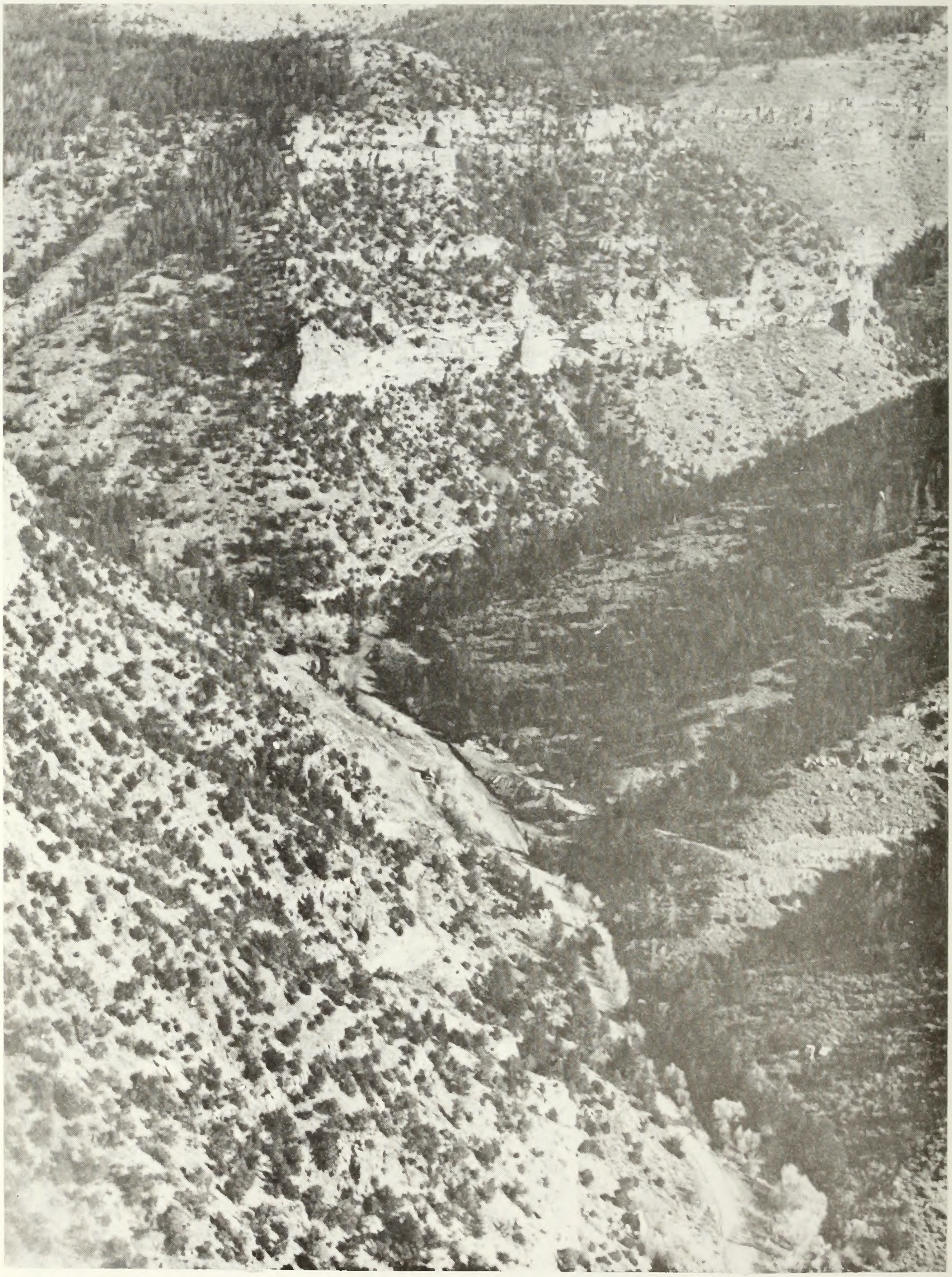


Figure 6.--Photograph showing proposed portal area in Dugout Canyon, Carbon County, Utah. The portal facilities would be below the drainage junction in the middle of the photograph and would extend downcanyon to include all of the old mine surface facility area. Note the two old buildings near the road.

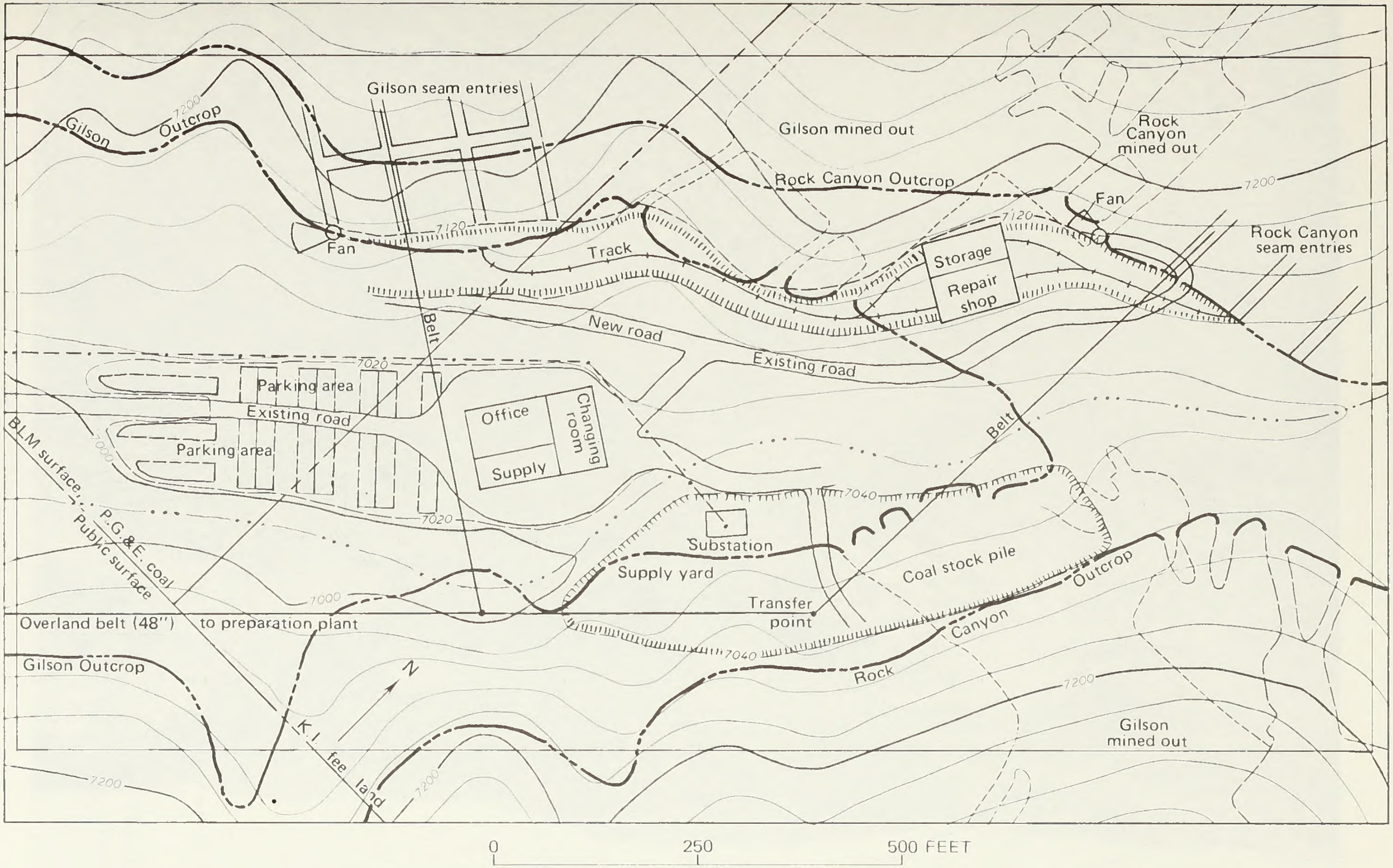


Figure 7.--Proposed layout of surface facilities at the Dugout Canyon minesite in sec. 23, T. 13 S., R. 12 E., including topography.

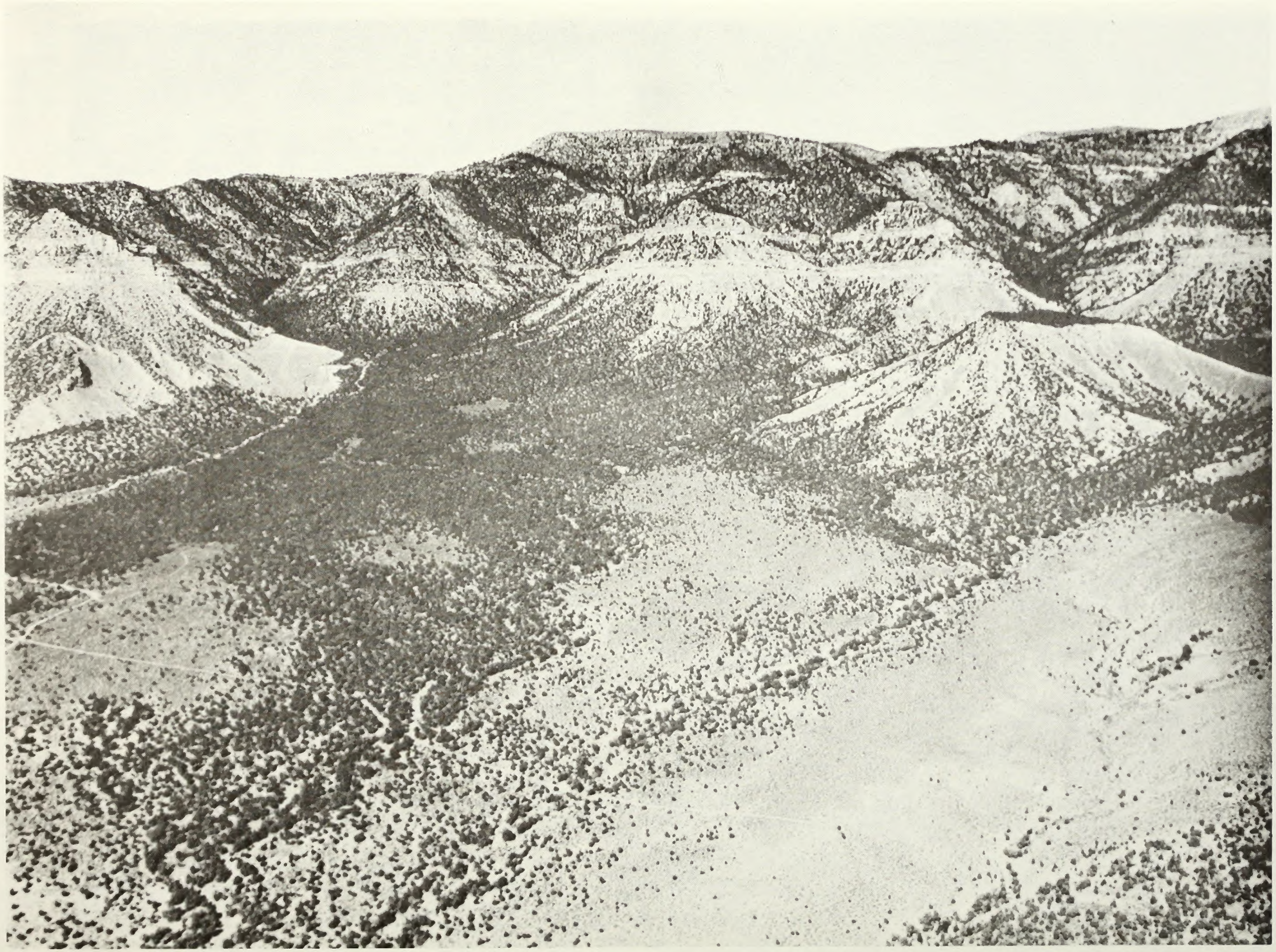


Figure 8.--Photograph showing northward view of the Fish Creek-Dugout Canyon central yardsite. The site would be located just left and above the center of the photograph in the dense woodland. The railroad would enter the picture above the road junction at the left edge of the photograph. It would loop around the plantsite.

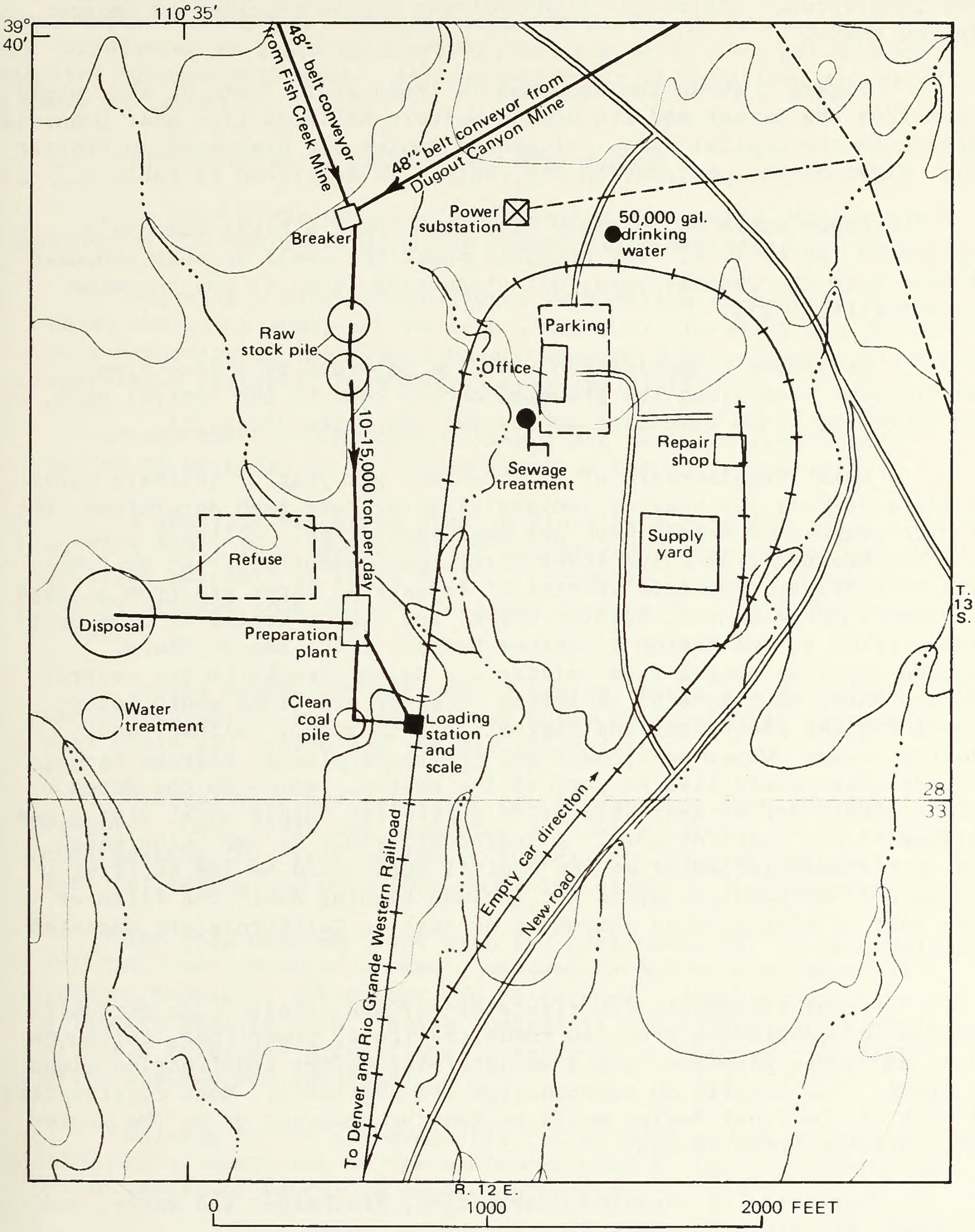


Figure 9.--Map showing proposed layout of the surface facilities at the central yardsite for the Fish Creek and Dugout Canyon mines, Carbon County, Utah.

graveled road to the central yard and for roads to slurry pond site and paralleling the conveyor belt routes to both the Dugout Canyon and Fish Creek plantsites. Additional rights-of-way may be required to improve existing roads.

Figure 2 shows the proposed railroad spur, route H, that would extend from the Denver and Rio Grande Western Railroad line near Sunnyside Junction to the central yard. Alternate routes are discussed in chapter VIII. Right-of-way application for route H is described in table 1.

Power would be obtained from Utah Power & Light Company's Helper-Moab 138 kV line. The proposed powerline would be near proposed railspur H to the central yard, with branching lines to the two mine plantsites (fig. 2).

Telephone communication would be provided by a line from Soldier Creek road along the graveled access road to the central yard, with branching lines extending to the two plantsites (fig. 2).

Water requirements of 42 acre-feet per year of culinary water and 378 acre-feet per year of industrial water have been determined, but definite sources of supply have not been identified. Culinary water would be obtained from Price River Water Improvement District or from wells or springs. Possible sources of industrial water are from storage of runoff in Pine Canyon, Soldier Creek, and Dugout Creek, or from deep wells drilled to the Ferron Sandstone Member of the Mancos Shale. Proposed pipeline routes from Soldier and Dugout Creeks to the central yard are shown on figure 2. A system of water pipelines would interconnect the two plantsites and central yard to supply culinary and industry water. Water settlement and treatment plants, storage tanks, and reservoirs would also be part of the system. Water in the mines would probably not be available or in sufficient supply until mining has continued for 5 years or more. A hydrologic study is now being made. Needs for industrial water at the central yard would be low at first because coal preparation would not include washing until the fifth or sixth year of mining, when shipments of coal to California are expected to begin.

Final alinements for rights-of-way and detailed use of public lands to be occupied by proposed roads, railroad, powerlines, telephone lines, and water pipelines would be determined after construction plans are drawn. Few details on construction are available. Most construction and much of the final design would be done by contract or by the appropriate utility organization.

Estimates of resource consumption, discharges and waste, and employment are given in table 1.

The company's proposed schedule of development shows construction and mine development starting in the third year and continuing for 6 years. Employment (at year end) during this time would increase from 203 to 950, and total coal production from 115,000 to 3.2 million tons annually (table 1). Based on current and projected Utah production rates, approximately 930 employees would be needed to produce 3.2 mty. This calculation is based on a production rate of 15 tons per manshift, including support personnel. All socioeconomic observations are based on these estimates.

C. ENVIRONMENTAL PROTECTION AND RECLAMATION

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

"There is a risk of subsidence when mining coal under the sharp and steep scarp of the Book Cliffs.... To alleviate or avoid this happening at Sage Point-Dugout Canyon, a 50 percent !of normall extraction rate will be enforced near the cliffs.

"Sage Point-Dugout Canyon Mine plans call for the columnization of workings on the three seams so far as is possible.

"A possible hazard is that of flooding during and after a major storm. This hazard is not considered severe as the maximum recorded rainfall at Price is 1.24 inches in 24 hours. The main slurry storage pond will be designed to contain 10,000,000 cubic yards.

"In the course of underground mining, dusts are generated by continuous mining and longwall and other coal handling equipment. Most dusts are wetted and thereby allayed.

"Central yard air pollution can be expected from the coal washery. Coal dusts are generated by coal breakers. As a part of coal washing the first action is to wet the incoming raw coal. Dust collectors are used throughout the plant to capture most dust.

"The coal washing plant with its coal breakers, vibrating screens, coal transfer chutes, compressors and vacuum pumps all produce excessive noise that can be reduced. Sound attenuators and silencers will be used. Noise control in the future will conform with the rules and regulations covering noise abatement of both State and Federal agencies.

"Housing is not now available for as many as 900 employees. Once again, depending on circumstances then in effect, housing will be an important factor in project planning.

"Applicant plans to cooperate in community planning.

"NGC intends to participate, indirectly or directly, in providing sufficient and adequate housing.

"The table on the following page is a reasonable estimate of housing needs. The assumption is that it will require 950 employees to mine 3 million tons per year. The table is based on furnishing housing for 75 percent of employees.

"Water quality will not be affected as there will be a closed hydraulic system with no discharge to natural drainage.

"The project is designed to maximize recovery and efficiency and will be engineered and operated to maximize safety, dependability, and long-term performance.

"The overland belts will be 48 inches wide equipped with a protective cover.

"Facilities for the collection, treatment, and disposal of human wastes meeting all State, Federal, and local codes and regulations will be provided. Effluent water will not be discharged into the natural stream drainages. Portable toilets are required for each underground section and collection of wastes must be a regular routine. Water treatment ponds will be fenced, either individually or through fencing of the entire operations area, to reduce the hazard to public, livestock, and wildlife safety.

"In a similar fashion the wastes from mechanical maintenance (rags, oil, and grease) will be collected and disposed of (buried) in a way that will not pollute or contaminate either the air or the water quality.

"Eventually, when the mine makes water, pumps must be provided to move this water to treatment so that the water may be re-used.

"Water re-use and conservation will be the watchwords of mine water policy. There is not enough water to allow waste.

"Water losses will be the result of evaporation and seepage. Water, whether potable or industrial, will not be discharged to natural drainage. Refuse-slurry dams will be sited to avoid natural drainage.

The mine plan contains the following statements with regard to reclamation:

"The Sage Point-Dugout Canyon Project calls for two periods of reclamation. The first is after the completion of construction (five years), estimated to take place during 1984. The second, and by far the most important, is exhaustion of coal reserves, estimated during the decade of the 2020's.

"After completion of construction at each site, the area would be policed to remove all debris. Surfaces of lay-down areas not to be used permanently would be graded to minimize erosion and to conform to natural contours. Revegetation would be attempted by mulching, if required, and by reseeding with species suitable for the area. All construction equipment not adaptable to the coal mining operation would be dismantled and removed from the project site at the end of the construction phase.

"Within 2 years after the exhaustion of mineable coal or the cessation of coal mining, whichever occurs first, all the area will be reclaimed. Support facilities such as rail spur; buildings; structures and fences; electric, communications and hydraulic lines; and all other equipment will be modified or abandoned in accord with legislation and regulations in effect at that time. Roads and rail-spur foundations will be graded, bridges removed and construction sites graded as required. Refuse dams and reservoirs will be graded and covered with soil. Dams will have been built to maximum slopes of 2:1 and hence should be stable.

"Reclamation of the two mine surface areas will require special attention. Because of large rock excavations required to provide sufficient space (horizontal to vertical ratio of 2:1), these areas will be graded to conform to the natural topography as closely as possible. Drainages will be restored. Mine portals and all other openings to the surface will be permanently sealed. Surface drill holes and water wells, except those for which further use has been arranged, will be plugged.

"Re-vegetation will commence as soon as practical. Mulchers and fertilizer along with re-seeding of native flora will take place.

"To predict what might happen over a span of forty years is risky. In the event that circumstances might result in closing one or both of the mines and substituting other entries from the surface, say a new portal or even a shaft, reclamation of the abandoned facility will commence promptly.

"NGC intends to conform insofar as possible to Federal and State rules and regulations in effect at the time of reclamation."

The mine plan refers to monitoring in the following statements:

"Beginning in June 1976, a water quantity monitoring program was started.... From the first month's measurements 14 locations were chosen as sites of representative flows.... These sites will be measured monthly for at least one year. Of the 14, permanent measuring devices have been installed at 4 locations....

"Water quality sampling began in late August 1976.... Plans are to continue to sample and analyze every six months for the next two years. Depending on the results of the present sampling program, the program will be expanded or reduced. Plans have also been made to turn three of the 1976-77 proposed drill holes into water monitoring wells after the holes have been completed."

D. LEGALLY ENFORCEABLE MITIGATING MEASURES

Chapters III and IV of part 1 discuss mandatory mitigating measures in overcoming or reducing adverse effects of proposed projects in the Central Utah region. Those that apply specifically to the present project are discussed here.

1. MINING PLANS

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 and Reclamation Act (SMCRA) of 1977 (PL 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, in this statement the applicable initial regulations are considered as a required Federal mitigating measure.

The mining and reclamation plans will be returned to the operator together with a request that they be revised in accordance with the applicable initial regulations. As soon as the mining and reclamation plans are revised and returned to the U.S. Geological Survey (USGS) they will be evaluated with the Office of Surface Mining to determine compliance with the requirements of Federal regulations at 30 CFR 211 and 30 CFR 700. The mining and reclamation plans cannot be approved until they conform to all applicable requirements.

2. LANDS

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 local BLM land administrating office.

Mining as many as three coal beds increases dangers from subsidence. The surface will be monitored by the operator to protect animal and plant life against hazardous depressions and open fractures.

Areas disturbed during construction but not used will be revegetated as soon as possible to minimize erosion. If water is available, supplemental irrigation will assure establishment of vegetation where natural soil moisture is inadequate.

3. WATER

Potential erosion and bank-cutting along Fish Creek will be mitigated by bridging over a section of the present channel instead of moving it.

No wastes shall be placed where they will pollute any waters of the State, and no waste water shall be discharged or allowed to enter any waters unless it meets the water quality standards required by the State of Utah (Title 73-14-1, et al.) or EPA, whichever is applicable. If the flow or yield of any springs, streams, or wells from which water has been appropriated or which are deemed significant to the human environment, is reduced 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. In order to have the information needed to determine the effect of mining on water, the company shall be responsible for inventorying said water resources before mining and for monitoring the flow of springs and streams, the water level in wells, and the chemical quality of these waters during mining.

4. VEGETATION

Reclamation to restore vegetation to 90 percent of original productivity may require as much as 10 years, and, if so, it will be required. (See part I, chapter IV.)

The various rights-of-way will not be fenced initially. If traffic becomes significant in livestock management, however, rights-of-way will be fenced. Any fences will allow deer passage. Consideration will be given to providing culverts for livestock to pass under heavily-traveled roads, railroads, etc.

Prior to any land disturbing activities a survey for threatened or endangered plant species will be taken. Any listed species found will be protected (see part 1, chapter III, no. 7 Endangered Species).

Sawtimber, fenceposts, and firewood will be salvaged during clearing.

5. ARCHEOLOGIC AND HISTORIC VALUES

The BLM and USGS entered into an agreement in July 1977 to protect the cultural resources on mineral leases. Under the agreement the BLM will be responsible for the cultural resource protection requirements for mineral leases on public lands.

The authorizing office (BLM) would comply with the basic 1906 Federal Antiquities Act (PL 59-209; 34 Stat. 225), the National Historic Preservation Act of 1966 (PL 89-665, 80 Stat. 915), the Historical and

Archeological Data Preservation Act of 1974 (PL 93-291), and the subsequent Federal regulations which provide legal backing and instructions for cultural resource inventory and protective consideration of sites.

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).

6. AIR QUALITY

Each 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 should use an appropriate combination of the following fugitive dust controls:

1. Pavement or equivalent stabilization of all haul roads used or in place for more than one year.

2. 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.

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

4. Reduction of fugitive dust to 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.

CHAPTER II: DESCRIPTION OF THE EXISTING ENVIRONMENT

A. NATURAL ENVIRONMENT

1. CLIMATE

The general climate is described in part 1, regional EIS, chapter II. Onsite temperatures are likely to be 6° to 10° F cooler than at Price, 15 miles southwest and 2,000 feet lower. Average monthly temperatures at Price range from 25° F in January to 70°-75° F in July and August. Extreme temperatures of record are -31° and 108° F. Mean annual precipitation at the proposed minesites is about 12 inches, 6 inches between May and September. Watersheds above the minesites may receive up to 25 inches of precipitation annually. The 100-year, 6-hour precipitation is 2 inches. Snow generally falls from January through March, and temperatures occasionally reach -30° F. The average frost-free period is about 140 days and extends from mid May to mid September. Potential evaporation averages 30 to 40 inches per year.

2. LAND

The Book Cliffs coal field, where the proposed mines are located, is discussed in part 1, regional EIS, chapter II.

a. Land Surface

The rugged topography is shown on figures 1 and 2. The southwest-facing Book Cliffs are deeply dissected by box canyons of intermittent streams that also cut the pediments that slope gently away from the foot of the cliffs toward the Price River. Altitudes range from 7,100 to 7,200 feet at the portal sites to more than 8,800 feet in the northeast corner of the lease area, 2.5 to 3.5 miles to the northeast. Large boulders of sandstone eroded from the cliffs are strewn over the sides of the canyons and out onto the pediments beyond the canyon mouths.

Except for the plantsites near the mouths of Fish Creek and Dugout Canyon, surface facilities will be located on the boulder-strewn pediment southwest of the cliff front (fig. 2). The road and proposed railroad access routes are mostly parallel to the southwest-draining intermittent streams that have cut shallow courses into the pediment. The proposed railroad route (H) climbs from about 5,500 feet near its origin at Sunnyside Junction to 6,400 feet at the central yard site (fig. 2).

The project area has not been surveyed for paleontological resources. Vertebrate and plant fossil-bearing areas are discussed in part 1 of the regional EIS, chapter II.

Because of the present lack of data and accepted evaluatory criteria for determination of significance, no meaningful assessment can be presently made as to the importance of these paleontological resources to science, education, or other values, hence to the significance of potential impacts on the fossil record.

b. Geology

The coal-bearing rocks of the Upper Cretaceous Mesaverde Group exposed in the Book Cliffs at the minesites are shown in the generalized section of figure 10. The Castlegate Sandstone and other thick sandstone beds are cliff-forming and account for the rugged topography. Above the section of figure 10 and extending into the overlying Tertiary section, the North Horn, Flagstaff, and Colton Formations are present in the northeastern part of the lease area. The Mancos Shale that underlies the Mesaverde Group is at the base of the Book Cliffs but is mostly covered by debris from the steep slopes above. The section shown in figure 10 is along the regional strike of the beds, which is parallel to the face of the cliffs. The regional dip is away from the cliff face toward the Uinta basin at a uniform rate of 6° to 7°.

The mining plan states that the area of calculated reserves is not faulted. However, Doelling (1972, p. 396) shows two northwest-trending faults that extend into the extreme northeast corner of the Sage Point property (sec. 2, T. 13 S., R. 12 E.). These faults, and other fractures measured in various parts of the section in different parts of the property, are approximately parallel to the regional strike of beds. They are probably related to slumping of large blocks of rock from cliff faces as the underlying soft Mancos Shale is eroded.

Cores from a drilling program in 1975 show numerous slickensides and fractures that may be due to rock movements at depth. None of the fracturing or faulting indicates large rock displacements that would create major problems in mining.

c. Energy and Mineral Resources

Coal, the major energy resource in the lease area, is discussed in chapter I-B. While none is produced at present on the Sage Point and Dugout Canyon properties, coal was mined from the Rock Canyon and Gilson beds at the Knight-Ideal mine in Dugout Canyon 1940-65, mostly within the fee area of Kennecott Copper (fig. 3). During that time 1.3 million tons was produced. Kennecott Copper Corporation bought the mine in 1965, but later closed the mine and bought coal elsewhere.

No oil or gas tests have been drilled on the properties, but the rocks above and below the coal beds have produced oil and gas elsewhere in eastern Utah. Unsuccessful wells have been drilled near the properties to the north and south to test sandstone tongues in the Mancos Shale.

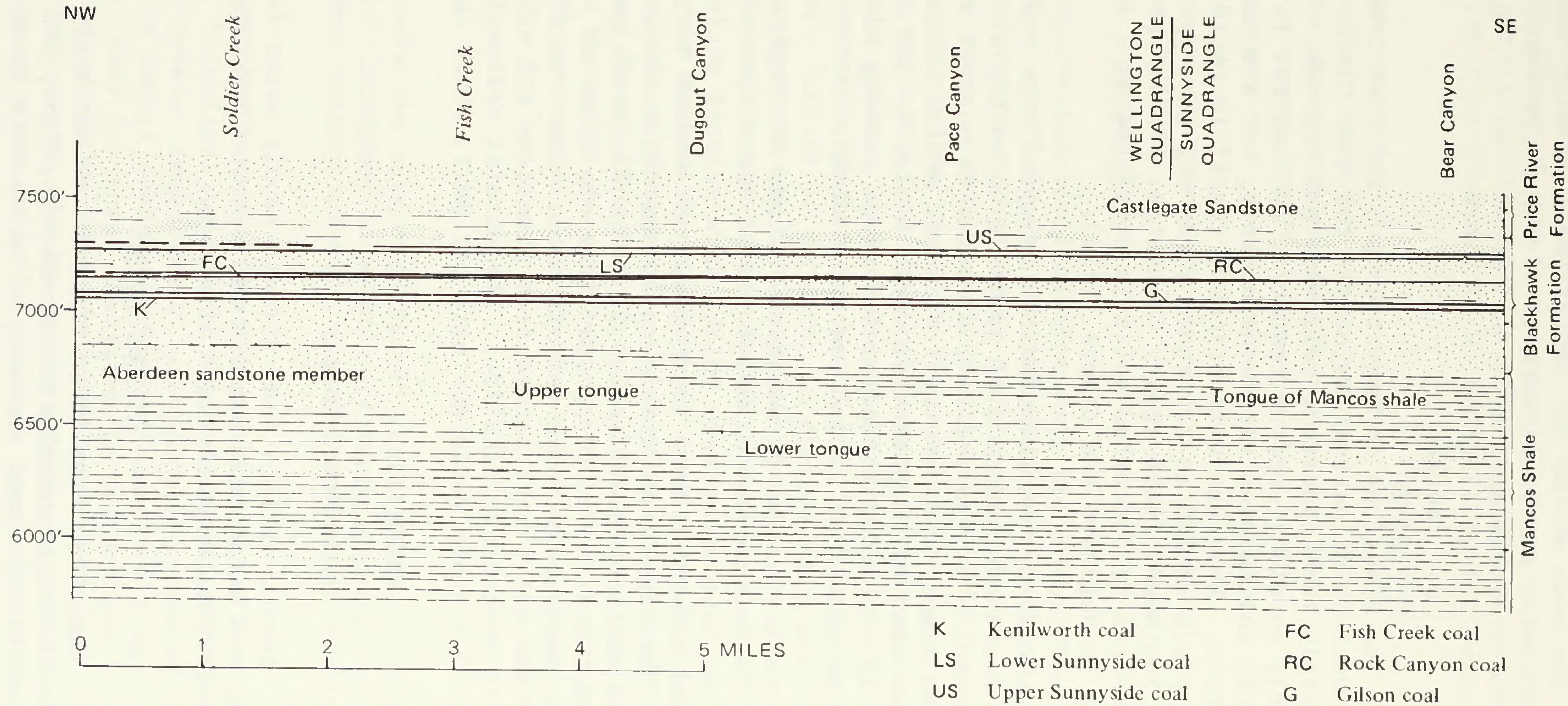


Figure 10.--Generalized section of Upper Cretaceous rocks in the area of the Fish Creek and Dugout Canyon minesites. (Adapted from Clark, 1928, pl. 4.)

The pre-Cretaceous rocks in which uranium deposits have been found in the area of the San Rafael Swell 40 to 50 miles to the south are present also in the subsurface of the properties. They have not been tested by drilling.

d. Soils

The minesites in Dugout Canyon and Fish Creek would be located near the bottoms of narrow canyons in the Book Cliffs, where soils are formed mainly from sandstone colluvium and bedrock. These soils are very cobbly to stony, medium textured, and neutral to moderately alkaline. Soil thicknesses vary considerably, but are commonly 2 to 6 feet over bedrock. They are well drained, runoff is rapid, and expected sediment yield is 2.0 to 2.5 cubic yards per acre per year if exposed (Pacific Southwest Inter-Agency Committee, 1968). Potential for revegetation success of disturbed soils is estimated at 2 to 5 years out of 10 (based on Hagihara and others, 1972).

Soils at the proposed central yard site and about half of the railroad route are composed of gravelly to cobbly alluvium over shale. These are soils of the pediment slopes that support a pinyon-juniper vegetation type. They are well drained, medium textured, and calcareous. Sediment yield potential would be 1.6 to 1.8 cubic yards per acre per year if exposed. Potential for range seeding success of disturbed soils is estimated at 5 to 7 years out of 10.

Soils on steep, southerly slopes are typically thin and rocky, rock cliffs being common. On protected aspects, soils are more continuous and have moderately thick, dark colored surface layers. They are formed primarily from sandstone, have medium textures, and are cobbly. The slopes are stable to moderately stable, and the natural estimated sediment yield is 0.5 to 2.0 cubic yards per acre per year on exposed surfaces. On the plateau (the dip slope of the Book Cliffs) soils are moderately thick and are dark. Textures are loam to clay loam. These soils have formed from limestone and sandstone and are neutral to moderately alkaline. The natural sediment yield is estimated at 0.3 to 1.0 cubic yards per acre per year, which is moderately low.

3. WATER

a. Water Supply

Seeps, springs, and streams supply water for livestock and wildlife, and water from Soldier and Dugout Creeks is diverted below the Book Cliffs for irrigation and livestock.

1. <u>Surface Water</u>

The lease area is in the Price River basin and is drained mainly by three perennial streams--Dugout, Pine, and Soldier Creeks--and by several intermittent streams, of which Fish Creek is the largest (fig. 2). Numerous springs contribute small amounts of flow for short distances in some of the intermittent streams. Drainage areas total 27 square miles--15 square miles of lease area and 12 square miles upstream--and average annual runoff is estimated from USGS gauging-station records and channel geometry (written commun., K. M. Waddell) as follows:

	Acre-feet
Dugout Creek---------------------------	1,100
Pine Creek-----------------------------	900
Soldier Creek above Pine Creek--------	3,000
Fish Creek-----------------------------	200
Other drainages-----------------------	300
Total----------------------------	5,500

2. Ground Water

The upper water-saturated sandstone beds 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 North Horn Formation (possibly the most permeable unit in the area) and the coal-bearing Blackhawk Formation, may be expected to yield water. Several deeper formations, including the Emery and Ferron Sandstone Members of the Mancos Shale also may be expected to yield water. Little or no water is present near outcrops along the Book Cliffs. Springs may discharge along outcrops of sandstone overlying less permeable strata and from fracture zones.

Ground water is derived by recharge of direct precipitation which infiltrates downward. Although the amount of water moving downward through a unit area is small (probably much less than 5 percent of annual precipitation), the total area is large and the total downward moving water is significant--as much as 35 acre-feet per year per square mile.

4. AIR

Particulates are the only significant contributors to air pollution at the mines. Increases in other pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, and photochemical oxidants would be negligible.

Air quality has not been monitored near this site, although P.G. & E. has recently installed equipment to gather information on background particulate levels, temperature, precipitation, and wind direction and speed. 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 (AeroVironment, 1977). The short-term (24 hour) TSP standard can be exceeded in many rural Utah areas as a result of wind blown dust. The background visual range was estimated to be 35 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 demonstrated an average of 67 miles for the period September 1970 to March 1971. Average visual range calculated from particle size distribution at Bear Creek and Huntington Canyons in 1974 was approximately 45 miles.

Analysis of photographs taken at Clawson, Utah 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 have shown averages between 94 miles in November-December 1976 and 54 miles in April 1977 (Pueschel and others, 1978).

5. VEGETATION

The leases and surface-facility areas are covered by the Conifer-Aspen, Aspen, Pinyon-Juniper Woodland, Ponderosa Pine, Mountain Brush, Sagebrush-Grass, Streamside and Desert Shrub vegetative types. Most of the surface facility areas have either Sagebrush-Grass or Pinyon-Juniper Woodland cover; whereas, the upper areas have a mixture of types. The portal sites also have Streamside vegetation. Example species are cottonwood, Douglas fir, Utah juniper, pinyon pine, big sagebrush, rabbitbrush, Gambel oak, maple, mahonia, elderberry, chokecherry, snowberry, serviceberry, Indian ricegrass, and wheatgrasses. These types are described in more detail, including species lists in the Task Force files.

No threatened or endangered plant species have been identified in the lease area (Welsh, 1977).

6. WILDLIFE AND FISHERIES

A large variety of wildlife lives in the proposed mine development area. Vertebrates number nearly 360 varieties (Dalton and others, 1977). Better known species include mule deer, elk, cougar (mountain lion), black bear, coyote, red, gray and kit fox, bobcat, raptor, chukar partridge, blue and ruffed grouse, mourning doves, and rabbits.

The proposed mines would be in the southern part of Utah's 1,169,000-acre deer herd Unit 27B (Range Creek) (part 1, regional EIS, chapter II). The Range Creek deer unit has 573,824 acres of winter range in normal winters and as little as 371,776 acres in severe winters (Utah Department of Fish and Game, 1967). Winter range is the limiting factor on this deer population. The Utah Division of Wildlife Resources has estimated that the available vegetation could winter 29,885 herd of deer on Unit 27B (written commun., Wilson, 1977). The mine portals and all the other facilities would be constructed in winter habitat.

Winter deer habitat in the mines vicinity of unit 27B is pinyon-juniper-mountain brush-grass and pinyon-juniper-grass. Pinyon-juniper-grass habitat has a low potential for supporting deer; unit 27B has 11,392 acres available in severe winters, which could support 146 head of deer. Pinyon-juniper-mountain brush-grass furnishes major deer winter range and unit 27B has 195,584 acres in normal winters, but only 157,760 acres in severe winters. The potential deer numbers each vegetative association could support if populated at the optimum levels is: pinyon-juniper-grass, 146, and pinyon-juniper-mountain brush-grass, 10,893 (written commun., Wilson, UDWR, 1977).

Elk were transplanted to the Book Cliffs by the Utah Division of Wildlife Resources. One hundred and nine elk from the Horn Mountains were released February 12, 1976 in the Book Cliffs and early reports state that the transplants have spread out and are reproducing. The proposed mine portals and plantsites are within the general range of these elk.

Cougar are found in the vicinity. These extremely sensitive and usually solitary animals have home areas closely associated with the seasonal distribution of deer, which serve as their primary food source. Seidensticker and others (1973) found that yearly home areas of individual animals ranged from 67 to 175 square miles. Winter-spring home areas ranged from 12 to 38 square miles in 1971-72 and from 24 to 94 square miles in 1970-71. Summer-fall home areas ranged from 41 to 113 square miles in 1970-71. They concluded home areas of resident cougars as well as the degree of home-area overlap with resident females.

No population estimates are available for cougar; however, unit 27B, which includes the proposed mines, ranked first in the number of cougars harvested during the 6 years from July 1, 1971, through June 1977. Thirty-seven cougar, making up 5.1 percent of the entire State harvest, were taken in that time (Fair, 1977).

Black bears are found in the Book Cliffs area, including the Dugout Canyon and Fish Creek vicinity. Based on Utah harvest figures, unit 27B, which includes these sites, ranked second highest in the numbers of bears taken in the State during 1967-76. Black bears essentially are solitary animals, regardless of population (Seton, 1909) and avoid human beings in their natural habitat. Seasonal movements generally are dictated by food availability (Skinner, 1925). Studies reported by Bray and Barnes (1967) indicate black bear males may have home ranges up to 700 square miles. Others found home areas as small as 32 square miles for females.

Cottontail rabbits, black-tailed and white-tailed jackrabbits, white-tailed prairie dogs, and several squirrels, chipmunks, and mice species are found in the area. Most of these, except the white-tailed prairie dog, are found throughout the area. A predatory-prey association exists between most of these species and predatory badgers, skunks, bobcats, coyotes, foxes, raptors, and possibly black-footed ferrets. Most predatory animals will readily scavenge given the opportunity.

The southern part of the area has been listed as potential black-footed ferret range (Scott and others, 1977). The potential range lies southward from the southernmost tier of sections (31 through 36) in both T. 13 S., R. 11 E. and T. 13 S., R. 13 E. This determination aside from the fact that the area is within the ferret's historical range, was based on (1) seven ferret sightings reported by reliable observers at various locations from north of Price through Woodside to near Green River, Utah within the past 11 years (Hinckley, 1970); (2) suspected black-footed ferret trenches and plugged holes in the general area of reported sightings (Hinckley, 1970); and (3) the presence of white-tailed prairie dogs, their principal food source. To date none have been identified in the immediate area. The black-footed ferret is listed as endangered under PL 93-205, Endangered Species Act of 1973.

Raptors use the entire vicinity year-round, nesting on the cliffs and ledges or in the trees. The pediment sloping away from the Book Cliffs provides the raptors with hunting fields for small mammals, birds, and reptiles.

The endangered peregrine falcon range includes the area. They have been reported occasionally in the Castle Valley area (part 1, regional EIS, chapter II); however, there have been no known sightings on the lease.

Chukar partridge are found along the base of the Book Cliffs around Fish Creek and Dugout Canyon. Blue and ruffed grouse may be found in the vicinity, and mourning doves are common spring-summer nesting residents. A wide variety of perching birds inhabit the area year-round.

There are no gamefish in the immediate area.

Several varieties of lizards, snakes, and other reptiles are found.

B. CULTURAL ENVIRONMENT

1. LANDS

The Carbon County zoning ordinances permit coal mining in the area of the proposed mined. A zoning ordinance was adopted May 19, 1959, by the Board of County Commissioners of Carbon County. Subsequent amendments have been adopted. The current printing of the ordinance is dated February 15, 1977, with a revised zone map dated 1974. The proposed P.G. & E. Sage Point and Dugout Canyon mines, including Federal and State lands, lie within a mining and grazing zone. 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 and mine waste dumps and underground mines and buildings and structures associated with mines and mine dumps.... Mine 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."

All mining operations are subject to the stipulation of the Price District Management Framework Plan published by BLM. All facility authorization must meet BLM standards detailed in the BLM Manual 2800 for minimal impact. Based on the present information of the BLM April 1977 Management Framework Plan, a corridor in the location of P.E. & E. railroad alternate route E (chapter VIII) would have the least impact. All leases and ancillary facilities related to the leases must meet BLM's visual resource management objectives.

2. RANGE AND TIMBER

Cattle and sheep graze the project area as follows:

Allotment	Class	No's	Season	AUM's
Clarks Valley	Cattle	141	4/16-5/31 10/16-12/31	567
Pine Canyon	Cattle	200	6/1-10/31	1,000
N. Clarks Valley	Sheep	--	--	496
Dugout Canyon	Cattle	200	6/16-11/15	1,000 (?)
Pace Canyon	Cattle	40	6/1-6/30 10/1-10/31	80
Total	Cattle	581		2,647
	Sheep	--		496

Only a part of these allotments would be impacted by the project.

A few junipers are cut for fenceposts and firewood, and pinyon nuts are picked occasionally.

3. SOCIOECONOMICS

In this area, which has a present population of 16,000 to 18,000, "Coal is King." The socioeconomic structure tends to be significantly related to incomes and a tax base that derive primarily from mining. Residents, particularly those from Price, are of many ethnic and racial backgrounds. The general population is cosmopolitan yet separated from other cosmopolitan populations in Utah. Farming and other agricultural activities are essentially part-time occupations. Published reports indicate established residents express a high sense of community pride and happiness with their homes and friends (Geertsen and others, 1977).

4. TRANSPORTATION AND UTILITIES

The nearest railroad to the lease is the Denver and Rio Grande Western (D&RGW) 13.5 miles away (route H on fig. 2) to the south and southwest. A haul road leads to the Dugout Canyon minesite from a junction with Soldier Creek Road, 4.5 miles north of its junction with US 6. About 4 miles northeast along the haul road, a jeep road branches off to the left to the Fish Creek minesite.

Highway traffic volumes south of Sage Point and Dugout Canyon properties are shown in table 2.

The corridor of the D&RGW railroad and US 6 and 50 also accomodate power and telephone lines.

5. RECREATION

The area lacks significant recreation attractions, and onsite evidence indicates that recreation use is light and activities are slight. Activities depend on low-standard roads and the natural character of the surrounding area.

Deer hunting in late October and early November is the predominate use. Other recreation uses and activities include: (a) four-wheel driving on low-standard roads and viewing the environment; (b) target shooting; (c) gathering pine nuts and firewood, rock-hounding, etc.; and (d) hunting small game and nongame species. Dugout Canyon is also used minimally for overnight camping at undeveloped sites, and for horseback riding. Some ORV may have been used in Clark Valley (fig. 1) but there is little evidence of it at present.

Clark Valley and the heads of Dugout Canyon and Fish Creek offer some opportunity for hiking, camping, nature studies, and solitude. Recreation visits for these purposes are few to nonexistent. Potable, perennial water is lacking in Fish Creek and Clark Valley. A small perennial stream flows in Dugout Canyon and does provide some user appeal and interest.

No records on recreation uses or activities are available for the proposed impact area. A description of the regional recreation area that would be impacted by this proposal is included in part 1, regional EIS, chapter II.

Table 2.--Current traffic counts in the Sage Point and Dugout Canyon mine areas

[Source: Utah Department of Transportation, 1975, except for Soldier Creek Road which is calculated.]

Highway	Highway section	Average daily traffic: Cars and light trucks	Trucks, 6 wheels or more	Total traffic
Soldier Creek ---	Between access road junction and US 6 and 50---------------	30	5	35
US 6 & 50--	Between Soldier Creek junction and Sunnyside Junction--------	2,690	325	3,015
U-23-------	Between US 6 and 50 and Dragerton---------------------	895	135	1,030
U-23-------	Between Soldier Creek junction and Wellington----------------	2,690	325	3,015
US 6 & 50--	Between Wellington and Price---	3,968	335	4,303
US 6 & 50--	Between Price and Helper-------	3,555	745	4,300

The percentage of local, long distance, and commercial traffic are not known.

6. ESTHETICS

That part of Clark Valley where the access road, railroad system, and power and telephone lines would be located is classified as having low (Class C) scenic quality. The valley is dominated by big sagebrush and stands of pinyon-juniper having little or no understory. The landform has little variation, and rock formations are of minimal interest. There are no outstanding or dominant features, and the landscape is similar to that of the pediment south of the Book Cliffs.

Dugout Canyon and Fish Creek and the immediate area to the south, where the mine portal entries, coal conveyor belt system, and plant facilities would be located, have a common (Class B) scenic quality. Slopes are moderately to deeply dissected; rock formations are present although not outstanding; and vegetation patterns have some diversity but are common to the general surrounding area and are restricted in species composition. The straight cliffs above the proposed minesite attract notice because of their prominence, but lack uniqueness or variety in color or form. They create a prominent, but common, panoramic scene in the background viewing zone from US 6 for a length of 65 miles. The combination of these features tends to be common throughout the character type, as viewed onsite and from US 6, which is the only major travel route in the general area.

The BLM's Visual Resource Management Class for the entire area falls within the IVb and IVc classifications (Roy Mann Associates, Inc., 1977). Both classifications are directed toward the maintenance, simulation, or enhancement of the natural landscape in all management or project activities. Visual Resource Management Classes IVb and IVc do permit modification and maximum modification during the life of a project or management activity. However, subsequent rehabilitation or reclamation must be adequate to, and directed toward, the reestablishment in appearance of a natural or near natural landscape.

Man-made intrusions include: the low-standard roads in Clark Valley and Dugout Canyon and along Fish Creek, a small voltage powerline, excavations at the proposed minesite at Fish Creek, and remnants and debris from the old mine in Dugout Canyon. Clark Valley has a natural character, where intrusions or uses, other than grazing, are few. However, much of Clark Valley was irrigated and farmed during the 1900's and the community of Kiz was in the area. Some remnants of the community, including building foundations and a cemetery remain. Remnants of the community would not be affected by the proposal, and previously-irrigated lands have reverted to big sagebrush and pinyon-juniper vegetative types.

7. ARCHEOLOGIC AND HISTORIC VALUES

Little is known archeologically of the lease area and immediate vicinity although some work has been done in neighboring areas.

These investigations have resulted in the recording of many archeological sites.

A reconnaissance survey of the lease area was done in September of 1977 by K. K. Pelli (Pierson, 1977). This survey located a previously-recorded pictograph panel in Dugout Canyon. No other sites were recorded.

The National Register of Historic Places lists no cultural sites for the area.

C. FUTURE ENVIRONMENT

The BLM land use plan orients management of these lands to livestock, wildlife, and watershed, with some incidental recreation use. Little, if any, development would occur in the area and the environment would remain about the same without mining.

CHAPTER III: ENVIRONMENTAL IMPACTS

A. NATURAL ENVIRONMENT

1. LAND

Chapter III of part 1 discusses adverse impacts that mining projects in the central region would generally be expected to have on the land surface and energy and mineral resources.

a. Land Surface

About 932 acres of land surface would be disturbed to some extent in constructing the proposed plantsites (table 1); roads; railroad spur; conveyor belts; central yard; reservoir; slurry pond; and power, water, and telephone lines (fig. 2). Earth to be moved is not estimated in the mining plans, except that for the dam at slurry pond site which would require 1,650,000 cubic years of fill.

On the Dugout Canyon property the Rock Canyon and Gilson beds would be mined. Subsidence could affect nearly all of the 2,576 acres of the leases, which includes some previously mined areas. On the Sage Point property, where the Sunnyside bed also would be mined, 5,000 to 6,000 of the 7,468 acres would be subject to subsidence. A large central area of this property and a smaller one in the southeast corner would probably not be mined because the beds are less than 4 feet thick.

b. Geology

Impacts to paleontological resources would consist of losses of plant, invertebrate, and vertebrate fossil materials for scientific research, public education (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 fossiliferous formation 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 presently assessed due to a general lack of specific data on such activities.

Due to the present lack of data and accepted evaluatory criteria for determination of significance, no meaningful assessment can be presently 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.

Because of the large, abrupt variation in overburden thickness and rather sharp changes in thickness of the seams in some places, an overall estimate of possible subsidence cannot be given. However, based on the mining plans, which show mining panels 550 feet wide and 2,500 to 6,000 feet long, and using information developed by Dunrud (1976, fig. 20), maximum subsidence could be about 70 percent of the thickness of the mined bed. For a single 8-foot bed this would amount to 5.6 feet; but, where two or three 8-foot beds are mined, maximum subsidence could total two or three times this amount.

Faults mapped at the surface in the northeast corner of the Sage Point property (see chapter II, geology) are in the area where overburden above the coal beds is 3,000 feet or more. If the faults extend to the coal beds, mining in or near them may trigger earthquakes and landslides and rockfalls in the cliff areas above.

Large scale excavation in preparation of the Fish Creek mine plantsite will result in a greatly steepened slope for about 700 feet along the east side of the canyon (fig. 5), and potential for landslides will be increased.

c. Energy and Mineral Resources

Present plans and mining methods would leave approximately 111 million of the 222 million tons (estimated) of minable reserves in the Sunnyside, Rock Canyon, and Gilson beds under a maximum 3,000 feet of overburden. Additional unestimated amounts of coal would be left where these beds thin to less than 4 feet and in other thin coal beds. During the 37-year life (estimated) of the mine, improved technology and economic changes may increase possible recovery.

d. Soils

Soils would be disturbed on about 932 acres (table 1). Of the total disturbed, approximately 60 percent would be on the gravelly soils of the pediment, 35 percent on the clayey soils on the Mancos Shale, and 5 percent on the soils of the steep, narrow canyons.

About 49 acres would be disturbed for construction of facilities at the Fish Creek and Dugout Canyon mines. This would involve extensive cutting into steep sideslopes, leaving a steep, rocky face up to 65 feet high and possibly would result in some rockfall and small slides. Erosion of exposed soil materials, primarily during construction, could exceed 7 cubic yards per acre per year on steep slopes.

At the central yard and slurry pond sites, impact to soils would relate primarily to taking the lands out of vegetative production for 37 years.

Soil productivity would be returned to near its present status after reclamation.

Road and railroad construction would disturb soil on about 202 acres, which would increase erosion and reduce soil productivity. Construction and maintenance problems would accrue from soils formed on the Mancos Shale. Montmorillonitic clay in the Mancos has a high shrink-swell potential, which could result in road surface heaving.

About 87 additional acres would be subject to varying types of soil disturbance.

2. WATER

a. Water Supply

The proposed mines would require 420 acre-feet of water per year for consumptive use. Increased population would require an additional 1,200 acre-feet of water per year for domestic use, of which 50 percent would be used consumptively; the other 50 percent would be discharged as effluent.

1. Surface Water

The impact of subsidence and subsequent earth cracks on the flow of springs and streams cannot be predicted. Above the proposed mines, some surface flow, potentially as much as 5,000 acre-feet of water per year, could be diverted into the ground. However, it is unlikely that more than one-fourth of that would be diverted, perhaps none. Such diversion would reduce available water on the lease, which would restrict use by wildlife and livestock. The flow of Soldier and Dugout Creeks below the Book Cliffs also might be reduced. Diverted water probably would be discharged eventually, but potential points of discharge cannot be predicted.

2. Ground Water

Any water use and mining below sandstone beds saturated with ground water would alter regional ground-water resources. Mining would cause a local decline in ground-water levels. The first effect of declining water levels necessarily would be in the strata mined in the Blackhawk Formation. Downward drainage into the mine would result in dewatering upper strata. Of particular concern would be dewatering the North Horn Formation, which may contain the most permeable sandstone in the area.

Subsidence and associated cracking might drain saturated beds, such as the permeable North Horn Formation above the Blackhawk Formation, and increase recharge to saturated beds in and below the Blackhawk.

3. AIR

Main sources of TSP would be dust from auto travel on unpaved roads and from coal particles at coal handling sites. Because of the large size of coal particles, most would settle within short distances (1 mile or less) downwind of the mine.

Dust from vehicle travel on unpaved roads would be the greatest contributor to TSP. Using the analysis of AeroVironment (1977) for an estimated 24-hour maximum concentration of particulates associated with an unpaved road network, and relating the calculated concentrations to the estimated daily one way passes of 950 cars and 130 trucks, it is estimated that concentrations as high as 240 $\mu g/m^3$ above background levels could occur within 110 yards (100 meters) of the road. This exceeds the 150 $\mu g/m^3$ secondary NAAQS, which does not apply here but serves as a point of reference. A 50 percent reduction in emissions due to watering was assumed in this calculation.

Total annual potential emissions from the mine (coal storage and transfer) and fugitive dust from auto and supply truck travel on an unpaved road would be an estimated 6,720 tons (120 tons from mining activities and 6,600 tons from auto and supply truck travel on an unpaved road).

Visibility would be significantly impaired in the immediate vicinity of the road by dust associated with auto travel to and from the mine. The impact would be short term in duration, confined mostly to periods of heavy traffic.

4. VEGETATION

As mining would be underground, major vegetation impacts would be caused by the mine facilities, roads, railroads, conveyor belts, central yard, slurry pond, and other construction. Approximately 932 acres of vegetation would be destroyed (table 1). This would be mainly in the Sagebrush-Grass, Pinyon-Juniper Woodland, Streamside and Conifer-Aspen vegetative types. Impacts in the portal areas would be more significant because of the Streamside type there. Little or no impact is foreseen on the vegetation overlying the underground workings.

No threatened or endangered plant species would be impacted.

5. WILDLIFE AND FISHERIES

Wildlife habitat would be degraded by soil disturbance and (or) vegetation removal. Because of noise, lights, activities, and traffic, some wildlife would avoid the area to various degrees. Effects of habitat degradation or destruction can be measured and quantified for some species but avoidance effects are more difficult to determine.

Offsite impacts also would accrue that are not directly attributable to mining. Improved access would bring more visitors to this now relatively unvisited area. Their presence would spread disturbance over a larger area, particularly affecting more sensitive species such as black bears, cougar, and deer. The magnitude of these impacts are not predictable.

Wildlife habitat would be directly destroyed on 932 acres (table 1), affecting different wildlife in different ways. Winter deer range totaling 837 acres would be lost. Construction of ancillary facilities outside the limits of winter deer range would destroy additional deer habitat. Small and nongame mammals, birds, and reptile habitat would be reduced by 1,020 acres, lowering their populations. Lowered numbers of these small animals would, in turn, reduce the food source of predatory birds and mammals. Data necessary to predict the impact to small and nongame mammals and birds or predatory birds and mammals are not available. The habitat loss would be expected to alter animal species and density composition.

Because of mine-caused disturbances and the blocking effect of conveyors, deer would be expected to avoid 3,148 acres of available winter range surrounding the mines at optimum capacity. The disturbance impact area would extend outward one-tenth mile from the periphery of disturbance centers at plantsites, central yard, and from the highway and conveyor. In this zone, deer feeding would be expected to be about 50 percent less than elsewhere in this wintering habitat not subject to the same amount of disturbance. Avoidance would be expected to be total at the disturbance source, gradually decreasing outward.

Based on a thorough literature search, it is assumed that the proposed 4.0 mile conveyor would block all migrating deer from crossing. The block caused by the conveyor and avoidance routes around the plantsites would form a shadowlike area downslope, where deer use would be lower.

Construction would destroy 77 acres of pinyon-juniper-mountain brush-grass winter deer habitat and deer would be expected to partly relinquish use on 433 acres more. The loss of 77 acres would reduce the deer population potential in this habitat by five head, whereas partial relinquishment would reduce the potential deer population by another 15 head. About 760 acres of pinyon-juniper-grass winter deer habitat destroyed and occupied by mine facilities, and partial relinquishment would be expected on 2,715 acres more. The loss of 760 acres would reduce the deer population potential by eight deer whereas partial relinquishment would reduce the deer potential by 14 deer. The proposed action would reduce the habitats potential to support deer by 42 head annually.

Reduced winter deer use, intrusions of the mine into Fish Creek and Dugout Canyon and the sensitive nature of cougars to disturbance, probably would reduce the cougar population potential in unit 27B by four. This projection is based on cougar behavior, in which male and female home areas overlap completely. Each drainage appears to have a favorable vegetation-topography/prey-vulnerability complex to support a resident male and female.

Destruction of canyon bottom vegetation for plantsites, roads, and conveyors would remove black bear and ruffed grouse food such as serviceberries, snowberries, elderberries, and dogwood. Fear of mining activities also would cause black bears to avoid using the mine vicinity. Probable impacts could affect two black bears. If the probable home areas in Fish Creek and Dugout Canyon are not presently occupied, they would not be expected to be reoccupied if the mine is opened.

Several blue grouse broods would be expected to be displaced if food were destroyed in Fish Creek and Dugout Canyon.

Pioneering by transplanted elk indicates that they would use the lease. Potential habitat affected would include all range within at least half a mile radius of the plantsites and the entire area upslope from the conveyor between the two mine portals. Approximately 2,000 acres would be impacted.

Available water is probably the most important habitat component for nesting doves. Loss of springs or seeps would reduce or eliminate the dove population.

Chukars require water nearby after the chicks hatch. Loss of springs and seeps would adversely affect their population, but lack of data prevents predicting the number of birds affected.

Collison hazard with vehicles would increase for all wildlife. Powerlines would present a strike hazard for birds. Deer would risk collison crossing roads in daily feeding migrations. Chipmunks, prairie dogs, and ground squirrels would risk collison during the day. Deer, jackrabbits, cottontails, mice, and snakes would experience the risk at night. Scavenging birds and mammals could then be struck by subsequent vehicles while feeding on roosting perches, greatly increasing their susceptability to illegal shooting if near a road. The incidence of illegal shooting in Utah is high where power poles are near roads and nearly nonexistent where they are distant (Ellis and others, 1969).

The proposed railroad spur, central yard facilities, slurry pond, water and slurry line, telephone line, and powerline (fig. 2) would be constructed on identified potential black-footed ferret range (Scott and others, 1977).

About 300 acres would be required to house new residents. Ring-neck pheasant habitat in the Castle Valley pheasant range probably would be reduced by the same amount. The habitat loss would reduce pheasant numbers by 39 females, 13 males and 176 young, annually. These estimates are based on 12 hens per 100 acres, a winter sex ratio of 3.2 hens per cock and an average production of 4.5 young per hen (BLM, 1977; UDWR, 1977).

The immigration, first of construction workers and their families and then of miners and other operating personnel, would result in increasing demand for all game and fish species. Illegal acts toward all wildlife would be expected to increase.

Water requirements, if the proposed action is implemented, amount to 1,620 acre-feet per year. Withdrawal of this amount of water from yet undetermined sources would probably reduce fisheries in the surrounding area.

B. CULTURAL ENVIRONMENT AND LAND USE

1. RANGE AND TIMBER

The 932 acres of vegetation destroyed (table 1) would reduce grazing capacity by approximately 63 AUM's or 2 percent of the total grazing area. Subsidence may cause some livestock watering springs to dry up. The project could further impact livestock by changing normal grazing and watering patterns.

A moderate amount of sawtimber, fenceposts, fuelwood, and pinyon nuts would be lost to the project.

2. SOCIOECONOMICS

The proposed mines would add about 5,500 residents to the Price City-Carbon County area.

Greatest impacts would accrue from urbanization. Carbon County's population could increase one-third. This would result in the need for approximately 660 new residences. New schools also would be necessary.

Other impacts would be costs of constructing, operating, and maintaining sewers, water systems, and streets; collecting garbage and trash; and police, fire, and health protection.

At full mine production, the total annual mine payroll would be about $15 million. Average salary for mine employees would be about $1,500 per month, approximately $200 more per month than Carbon County miners received per month in 1975. It is possible that county average annual salary would be about $7,500 to $8,000, which is approximately $1,000 more than comparable figures for 1975. Benefits from higher incomes and an increased tax base expand the economy in the Carbon County-Price City area.

3. TRANSPORTATION AND UTILITIES

At least one unit train per day would be added to present rail traffic between the mines and the proposed powerplant in central California.

Commuting traffic would add about 950 vehicles per day to present traffic. Truck traffic supplying the mines would add about 130 vehicles per day. Adding these 1,080 vehicles per day to present traffic (table 2) would increase traffic on Soldier Creek Road and the mine access road more than 30 times, and would increase the load on US 6, which is at its efficient capacity of about 3,000 vehicles per day.

Thirteen miles of unpaved roads would have to be upgraded. Of this mileage, 5.4 miles in the vicinity of the mines and washery would be upgraded by the company. The remainder, presumably, would be the responsibility of the county. It is likely that the paved Soldier Creek Road between Wellington and the mines turnoff would receive more maintenance and some upgrading.

4. RECREATION

Mining and related activities at the mouths of Dugout Canyon and Fish Creek and at the plantsite would eliminate or displace present recreation activities. The greatest impact would be eliminating 100 visits and 50 visitor days use (estimated) at undeveloped campsites in Dugout Canyon.

Present recreation uses in Clark Valley, south of the plantsite, would increase as a result of improved access. Some increase in use, to observe mining and associated activities, could also be expected.

Except for hunting and ORV use, impacts from legitimate increased use of the recreation resource would be minimal, even if use increased several-fold. Road kills of wildlife from increased traffic, increased speeds on improved access roads, increased hunting pressures, and wildlife habitat loss could reduce wildlife populations. Subsequently, hunter success (particularly regarding mule deer) could decrease 5 to 7 percent (40 to 50 deer) annually during the life of the project. Increased ORV use in Clark Valley could result in disturbance of wildlife and a loss of soil, vegetation, wildlife, and watershed production and values.

Littering and vandalism would increase from increased use of the area. Noise, dust, and some air pollution within and adjacent to the area would increase.

Inventories, analyses, and decision as to whether parts of the area would qualify as a roadless area or potential Wilderness Study Area have not been completed. Implementing the proposal would preclude delineation of occupied areas as roadless or Wilderness Study Areas.

The projected increase of 5,000 new residents in Carbon and Emery Counties could create significant impacts to regional recreation attractions through increased visits and use. These impacts are addressed, on a cumulative basis with other proposals, in part 1, regional EIS, chapter IV.

5. ESTHETICS

The landscape would be modified by industrial facilities and activities.

The proposed railroad system near the Sunnyside Junction or from Wellington (fig. 2) would be the only facilities in the foreground-middleground (0-3 miles) viewing area from US 6. Mining intrusions in this zone could not be seen with clarity from this vantage point.

Facilities and activities at the mines and plantsite would not be viewed by most of the travelling public. Some of the individuals viewing the proposed development would have major concerns for changes in the visual character of the area. Facilities and activities associated with the proposal would be similar to those supporting other mining activities in the general area. The sensitivity level, relating to modification or introduction of industrial intrusions in the area, has been designated as Class M (Medium).

The modifications would remain until mining ceased and reclamation and natural processes reestablished the present natural-appearing landscape. Some evidence of past mining, such as the main access road, railroad bed, and mining residues, would remain after reclamation.

6. ARCHEOLOGIC AND HISTORIC VALUES

The only site located during the reconnaissance was a pictograph panel (42cb92) recorded previously by Dale Berge of Brigham Young University. This site may be vandalized because of its proximity to the road.

Additional archeological sites may be found during the intensive survey that will be conducted prior to development. Increased population due to mining may result in more vandalism of cultural, archeological, and historical sites. Improved access also may result in increased vandalism to sites that may be present. Required surveys will add to the cultural resource knowledge of the area.

CHAPTER IV: MITIGATING MEASURES

Approval of the proposed action will include requirements for mitigating measures to eliminate or minimize the adverse impacts described in chapter III. The operator is committed to those mitigating measures proposed in the mining plan, as described in chapter I-C, and is subject also to other enforceable mitigations, as described in chapter I-D. Other mitigations and alternatives are described in chapter VIII.

CHAPTER V: ADVERSE EFFECTS THAT CANNOT BE AVOIDED

A. NATURAL ENVIRONMENT

1. LAND

Adverse effects on land as the result of construction of surface facilities and waste-disposal systems would not be mitigated totally by reclamation. Nearly all the land, however, could probably be returned to previous uses without loss of productivity. In undermined areas, however, subsidence and potential for subsidence could create hazards for surface construction, even though previous use for grazing and hunting would not be affected. Unavoidable destruction, disturbance, and removal of paleontological resources, both exposed and unexposed, would occur. The significance of this impact cannot be presently meaningfully assessed due to the lack of data and evaluatory criteria.

The overburden is too thick for the coal to be recovered by any present method other than underground mining. As much as 50 percent of the minable coal, however, must remain unrecovered in pillars and barriers to provide roof support and fire protection during mining--111 million tons (estimated) in the three minable beds. Additional unestimated amounts of coal would be left where beds are less than 4 feet thick.

Removal of vegetation and disturbance of the soil would result in increased erosion on 932 acres. Greatest potential for erosion would be during construction and the tear-down period just before reclamation, when erosion rates would be 2 to 7 cubic yards per acre per year.

Soil productivity would be lost on areas occupied by mining and support facilities until the area is reclaimed after approximately 40 years. About 55 acres, out of production and subject to erosion only during construction, would be revegetated as soon after construction as possible--probably within a year or two.

2. WATER

Increased use and consumption of water for coal mining and associated uses cannot be avoided. About 420 acre-feet of water per year would be consumptively used in mining, and needs for domestic water supplies would increase by 1,200 acre-feet per year.

Disruption of watersheds cannot be mitigated. The flow of springs and streams on about 15 square miles of the lease would be reduced; thus, less would be readily available for onsite use by wildlife and livestock. Runoff from the lease and 13 square miles of upstream watershed might be diverted into the ground through subsidence fissures. This could reduce the quantity of water available for downstream use by as much as 5,500 acre-feet per year.

Mining would cause a local decline in ground-water levels and alter ground-water flow patterns in the mine area.

3. AIR

Assuming paving or chemical stabilization reduced fugitive dust emissions from roads by an additional 70 percent over watering alone, the 24-hour maximum incremental increase in TSP would be approximately 70 $\mu g/m^3$. This is below the secondary NAAQS of 150 $\mu g/m^3$. Visibility would not be significantly impaired near the road.

4. VEGETATION

Vegetation removed in constructing facilities would result in an annual loss of 63 AUM's of grazing capacity. The normal grazing patterns of domestic livestock would also be disrupted somewhat. A small volume of sawtimber, fenceposts, and firewood would be salvaged before construction, but they would not be replaced (regrown) until some years after mining ceases.

5. WILDLIFE

All types of wildlife habitat would deteriorate because of physical destruction and disturbance. Vehicle-wildlife and bird-powerline collisons would occur. These impacts would reduce wildlife numbers and reduce the habitat potential to support them.

B. CULTURAL ENVIRONMENT AND LAND USE

1. TRANSPORTATION AND UTILITIES

Unavoidable adverse impacts would consist of an increase of 7 to 10 unit trains per week to present rail traffic between the minesite and central California, an increase of about 1,080 vehicles per day to local traffic patterns, and the disruptions and inconvenience of road upgrading.

2. RECREATION AND ESTHETICS

Eliminating or displacing recreation opportunities in the mouths of Fish Creek and Dugout Canyon and at the plantsite in upper Clark Valley would be unavoidable.

Some indiscriminate ORV use, vandalism, and littering would occur, regardless of increased law enforcement or regulation. Loss of hunter success would still occur, regardless of mitigating measures.

The landscape would be altered from one with few obvious man-made intrusions to one of intense activity and substantial man-made intrusions. To individuals with major concerns (less than one-fourth of the viewers) for maintaining the present landscape character, this would be adverse.

3. ARCHEOLOGIC AND HISTORIC VALUES

Increased population in the area may result in vandalism to archeological and historical sites within the region.

CHAPTER VI: SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

This area is suitable for mining. Some mining has occurred there in the past, and so, other than implying an increase in production from the region, this mine would not create a significant change.

Short term, as used here, includes pre-mining development and construction, mining and coal transport, and post-mining reclamation periods. Long term, as used here, begins after reclamation.

The use of 932 acres for 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 and potential subsidence above the undermined area of 7,200 to 8,200 acres could restrict long-term use involving building surface structures. An undetermined number of uninventoried exposed and unexposed fossil localities could be impacted or destroyed. Knowledge of paleontological resources could be acquired due to surveys and exposure of resources which might never have been found without excavation.

Water required for mining (420 acre-feet per year) and for related support activities (1,200 acre-feet per year) would be available for other uses when mining ceases.

In the short term, soil productivity and vegetation, including range, forage, and woodland products, would be lost to the project. In the long term, after reclamation, these areas should be almost as productive as now. Some sites may increase in productivity. Unreclaimed road surfaces would remain without vegetation.

Decreased wildlife population potential resulting from mining activities and increased human encroachment would be short term.

Access routes to the mine during its life would remain. Use of these routes after mining would continue to depress wildlife productivity and be long term.

The increase in traffic consequent to the mining operation would be short term. Road construction and upgrading would follow the alinements of present roads, so that improved road would remain as a long-term effect. The railroad spur would probably be salvaged or converted to other destinations.

Long-term effect on productivity would be small, consisting primarily of imperfect revegetation, of loss of vegetation due to presence of roads, and of any semipermanent changes in wildlife feeding and seasonal movements interrupted during the years of mining.

Short-term use of the area for mining would eliminate or displace 100 recreation visits and 50 visitor days (estimated) use in the mouths of Dugout Canyon and Fish Creek and at the plantsite in upper Clark Valley. Other areas associated with the proposal still would be available for present recreation. Improved access in lower Clark Valley in effect would improve the opportunity for more people to visit the area in motor vehicles. Improved access would generate additional recreation use of the impact area on a long-term basis.

Impacts to hunter success should be short term. Once reclamation and proper wildlife management were applied, wildlife numbers and hunter success would be expected to increase.

The present landscape would be modified from near-natural to one with significant industrial modifications and activities during the life of the mine. Once the mines are exhausted and developments removed, only the railroad bed, paved access road, and minor residuals of mining and support facilities would remain. The presence of the road, railroad bed, and residuals would constitute a permanent, but minor modification of the present landscape. The area, as indicated by the natural succession process related to the farming community of Kiz, indicates that over the long term (50+ years), the landscape would return to a near-natural character.

Any archeological sites disturbed during development of the site would result in a long-term impact to the inplace value of that site. Collection of sites that might be found will insure recording of information that could otherwise be lost to natural forces or vandalism.

CHAPTER VII: IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An undetermined number of uninventoried exposed and unexposed fossil localities would be impacted or lost.

Mining of up to three beds beneath 7,200 to 8,200 acres would irreversibly commit the surface to subsidence or potential subsidence of up to 70 percent of the thickness of coal removed.

The 111 million tons of coal removed from the Gilson, Rock Canyon, and Sunnyside beds over the life of the mines will be consumed as a nonrenewable energy resource. About the same amount of coal must remain in place as pillars, firewalls, and other roof support. This and unestimated coal that cannot be recovered where beds are less than 4 feet thick, will remain as irretrievable resources unless and until methods can be developed to recover them.

The 420 acre-feet of water used each year for mining would be irretrievable. Additional domestic water required, 1,200 acre-feet per year, would also be irretrievable except for effluent (about 600 acre-feet) which could be reclaimed.

Changes in ground-water flow patterns resulting from mining and subsequent subsidence would be irreversible.

The termination of coal mining operations would lead to a termination of pollutant emissions. Thus the air would not be irreversibly committed as a result of the mine operation. Emissions from secondary growth and related activity such as traffic, urban fuel consumption, etc., induced by the proposed action would be more permanent in nature and result in a long-term commitment of the air to some deterioration.

Soil productivity and vegetation, including range, forage, and woodland products, would be irretrievably lost to the project. Forage losses of 63 AUM's per year for 40 years would total 2,520 AUM's. Woodland products lost would be relatively minor. Proper reclamation of the disturbed areas would prevent irreversible commitment of the vegetative resources.

Any soil lost by erosion would be irretrievable.

Wildlife lost and wildlife habitat potential affected, would be irretrievable. Wildlife habitat destruction and disturbance resulting from mine- and mine-related access that continued beyond the life of the mine would be irreversible.

Rail-haul distance has not been announced. Although fuel and supplies consumed, therefore, have not been determined, 7 to 10 unit trains would be committed, including 28 to 38 engines, 7 to 10 cabooses, and 850 70-ton cars or 595 100-ton cars.

The miners probably would live in the local area, but distribution among the general population has not been attempted. Consequently the commitment of fuel, supplies, vehicles, and time to commuting has not been calculated. The same is true of the incidental truck traffic supplying the mines and miners.

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 (limited or controlled hunts) after mining ceases.

The area would revert back to near the present landscape character after mining and reclamation, except for some incidental residuals and the main access road.

The cultural resources in the immediate project area could not be preserved in place.

CHAPTER VIII: ALTERNATIVES

Chapter VIII of part 1 includes references to administrative, technologic, and energy-source alternatives on a regional basis. Considered here are alternatives that apply to developing the Sage Point and Dugout Canyon properties.

A. NO ACTION

Pursuant to implied covenants of both the Federal mineral leasing laws and the existing lease agreements, the Secretary is obligated to respond to a legitimate application to conduct mining operations on a valid lease, provided that all terms and conditions thereunder have been met. His response may be approval as proposed, rejection on various legitimate grounds, approval in part and rejection in part, or approval subject to such additional conditions and requirements or modifications as he may impose under the laws. He may also defer decision, based on proper grounds, as described elsewhere in this chapter.

"No action" on proposals for continuation of approved ongoing mining operations would equate to closing down existing operations; under existing regulations, operations may not proceed in the absence of approved mining plans and related permits. The impacts of taking no actions in such cases would be approximately the same as those described under the following subsection C (2), "Cancel the leases."

"No action" on mining proposals for the initial development of existing leases would equate to maintaining the status quo on those leases. The impacts of taking no action in these cases would be the same as described subsequently under subsection C, "Prevent further development on existing leases."

The coal that would be mined on the Sage Point property would be used by a generating plant to be built by P.G. & E. in northern California. The coal from the Dugout Canyon property would be used by KCC for fuel and metallurgical needs in Utah and Nevada. If the application to develop the properties were denied, the companies would seek and develop coal sources elsewhere or buy coal in the open market. The anticipated environmental impacts thus would be shifted to new supply areas, possibly to areas less favorable, economically and environmentally, than the Price, Utah area, where coal mining is a long-established industry.

B. DEFER ACTION

For proper cause, the Secretary may defer final action on a proposed mining and reclamation plan. These could include, but are not limited to, the need and time required for:

1. Modification of the proposal to correct administrative or technologic deficiencies.

2. Redesign to reduce or avoid environmental impact.

3. Acquisitions of additional data to provide an improved basis for technical or environmental evaluation.

4. Further evaluation of the proposal and (or) alternatives.

The principal effect of deferring action on a proposed mining and reclamation plan on these grounds would be a comparatively short-term delay in the imposition of all related impacts of the proposal as previously described in the unavoidable adverse impacts section of this statement.

Once a mining and reclamation plan is approved, the regulations and lease terms require that all subsequently proposed departures and deviations therefrom be approved in advance by the USGS. The regulations (30 CFR 211) also permit the USGS to direct that changes be made in previously approved operations. For example, changes could be ordered to accommodate new, improved, or revised administrative requirements, technologic improvements, environmental concerns or requirements, or revisions of prior evaluations thereof in the light of experience or previously unknown factors.

C. PREVENT FURTHER DEVELOPMENT ON EXISTING LEASES

The only alternatives to allowing development of existing leases is to prevent such development or to impose additional conditions and restrictions on the operations. The several apparent means of preventing full development are discussed below.

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, other comparable quantities of coal or sources of energy would be required to meet national needs. The development of other sources and related impacts is discussed later.

1. 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, and future suspensions of operations for reasonable periods, with proper grounds, could be imposed. The Secretary cannot, under present circumstances, suspend operations to the extent that a de facto 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 operations pending legislation remains available. Impacts of this alternative would be similar to those described in subsection C (2), "Cancel the leases."

2. CANCEL THE LEASES (NO NEW DEVELOPMENT)

The Secretary does not possess authority to unilaterally cancel the leases except on the ground defined therein (section 7 or 8 of the lease terms--"Proceedings in case of default"). The authority to cancel on other grounds would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees as may be necessary. The Administration has not entered a request for such legislation, and the Congress has not initiated such action in 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 non-environmental concerns.

Present production could be interrupted temporarily or terminated completely, as could further development of all existing leases.

To the extent that coal production from existing leases was curtailed or halted, alternative sources of energy would be required to meet present needs and demands. These could be foreign and (or) domestic and are discussed in later pages. The time required to replace the resource foregone could range from scant to a number of years, depending on the specific alternative(s) selected and its state of production.

Environmental impacts of the proposals could range widely, depending on the administrative action taken on existing leases. If these leases were cancelled through Congressional authorization, proposed mines would be avoided. Conversely, should development eventually be authorized, environmental impacts as discussed in the impact chapter would occur. The net result would be a deferral and perhaps reduction of impacts through changed technology or requirements imposed at that time.

3. FEDERAL ACQUISITION OF LEASES

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 under subsection C (2).

4. REJECT THE MINING AND RECLAMATION PLANS

Rejection of the proposed mining and reclamation plans would result in no environmental impact on the leased lands, and they would continue in their present condition, subject to modification by natural process and by the condition of other existing activity and uses--and to further modification by the surface owner to meet other uses.

The Secretary may reject any individual proposed activity 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 designed course of action by the lessee (operator). 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 Congress. Viability of this option is dependent upon timely legislative action; the option of rejecting the proposed plans pending legislation remains available. Impacts of this alternative would be similar to those described under subsection C (2), "Cancel the leases."

D. RESTRICT DEVELOPMENT ON EXISTING LEASES

The subject leases convey the right to develop, produce, and market the Federal coal resource thereof if all other terms and conditions have been met by the lessee. In general, the Secretary does not possess the authority to arbitrarily constrict development. 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.

Thus, under present conditions, a general effort to restrict or regulate development of existing leases 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.

E. APPROVE THE MINING PLAN AFTER MODIFICATION

A number of the impacts identified and described in chapter III of this statement could be more fully mitigated by the selective application of those measures described that are supplemental to the proposals of Pacific Gas and Electric Company or by implementation of one or more of the alternatives described below. In addition, special conditions could be added to the approved plans relating to the secondary effects of the mining. Such conditions must be reasonable and, if unacceptable to the lessee, could result in the lessee not developing the lease areas with the resultant impacts previously discussed under subsection C (4) "Reject the mining and reclamation plans."

The application of watering to unpaved roadways already has been included as a design method in the analysis of the proposed action. Watering, which is approximately 50 percent efficient, would be most beneficial if done shortly before periods of heavy traffic. In another study (ERT, 1978) it was estimated that paving, or treatment with chemical stabilizers which approximate paving, could reduce fugitive dust emissions from roads by an additional 70 percent. In lieu of paving or chemical stabilization, control of vehicular speeds also would reduce fugitive dust emissions from travel on unpaved roads.

If safety problems or user conflicts are created from increased use on the improved access road to the proposed project area, use restriction (such as designation as a service road) could be applied.

All appropriate agencies should consult with the U.S. Fish and Wildlife Service under the provisions of section 7 of the Endangered Species Act (P.L. 93-205) before issuing rights-of-way in potential black-footed ferret habitat.

Powerlines should be separated from roadways by at least 300 yards to reduce the indiscriminate shooting hazard for perching raptors.

Wildlife losses and loss of hunter success could be mitigated to some extent by restricting haul traffic to daylight hours during the winter, when animals use the area as winter range.

Mitigation of impacts to the visual resource could include designing and placing structures in seldom-seen areas and in painting some structures to match those of the surrounding vegetation and rock formations. Cleaning up of old mining residues, trash, etc., from previous mining in Dugout Canyon would improve visual characteristics. Reseeding of cut-and-fill slopes concurrent with construction and development also would help maintain a more pleasant visual character throughout the impact area.

One composite alternative could reduce impacts to the recreation and esthetic resources: combine the railroad, and access road and telephone and powerlines in a single corridor outside of Clark Valley. This might be in Soldier Creek to the west or on the reseeded pediment east of Clark Valley. If placed in Soldier Creek, these support facilities could be partly combined with those needed to support the Amca (Centennial) proposal for Deadman Canyon and Coal Creek.

If any archeological 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 to provide for the preservation of data from the site(s).

F. ALLOW DEVELOPMENT OF SELECTED AREAS NOW UNDER LEASE

This alternative would permit only selective exploration and development on existing leaseholds, based on anticipated adverse environmental consequences. The decisionmaker has the authority and responsibility to evaluate the coal resources and impacts of mining on these leases prior to acting on the proposals. Exploration and development could be allowed only on these leaseholds, or portions thereof, that would have the lowest anticipated adverse environmental consequences. Weighing the tradeoffs of mining or precluding mining on selected tracts is part of the evaluation and decision process. Adoption of this alternative would reduce adverse effects by reducing the area in which the impacting activities could take place.

The alternative of allowing the development of only selected areas already under lease constitutes a selective application of the above. Absent a showing lease-by-lease or plan-by-plan of the likelihood of totally unacceptable environmental impacts that could not be reduced to an acceptable level, the Secretary does not possess the authority to otherwise constrain development of the leasehold if all other requirements of the lease have been met. In addition, application of this alternative would not permit maximum recovery of the coal resources and would then 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.

G. ALTERNATIVE TRANSPORTATION ROUTES, UTILITY ROUTES, AND SLURRY POND LOCATIONS

1. COMPANY-PROPOSED ALTERNATIVES

a. Railroad Routes

Figure 11 shows alternative railroad routes E, F, and G. Area requirements for construction are given in table 4. Alternative route E would terminate about the same distance from the Fish Creek minesite as proposed route H (fig. 2), but would be farther from the Dugout Canyon minesite. Route F would terminate several miles farther from both minesites than route H. Steep slopes caused by dissection of the pediment would prevent extending routes E and F to the proposed central yard site. No alternatives to the proposed location of the central yard site (fig. 2) are indicated in the mining plans. Presumably, an additional conveyor belt or a trucking system would be used to move coal from the proposed central yard site to loading points on alternative rail spurs E and F.

Route E parallels Soldier Creek Road and thus would tend to concentrate road and rail traffic in a single corridor and not encroach on undisturbed areas, as compared with the other routes.

Route F begins at the same point as the proposed railroad route and parallels Rock Creek for most of its length.

Route G originates at the same point as route E near Wellington, but branches from E to join the northern part of route H.

All the rail routes are located on similar soils, and variations in soil impacts would relate primarily to amount of area disturbed by construction (table 3).

Impacts of the various routes on vegetation would be similar and directly proportional to the length. Routes E and G, which are located on agricultural lands in some places, therefore would have somewhat greater impact.

Of the alternate rail routes, F would destroy the least amount of wildlife habitat, and G destroy the most. Route F might be a better choice for wildlife than proposed route H or the other alternate routes, E or G, because it would occupy the least amount of habitat, make the least intrusion into deer winter range, and follow an already developed corridor up Clark Valley. The advantages of this alternative might be offset, however, by the need for a longer belt conveyor or an intermediate trucking system between the central yard and the railroad loadout point.

b. Powerlines

Figure 11 shows two alternate powerline routes that generally parallel alternate rail routes E and F. Table 4 shows area requirements for construction. Impacts on the soils and vegetation would not be significantly different than those of the proposed line near rail route H (fig. 2 and table 2).

c. Slurry Ponds

Figure 11 shows alternate slurry pond sites for disposal of coal wastes from the coal washing plant, and table 4 shows acreages they would cover. None of the alternate sites, A, B, or D, is as favorable as the proposed site C (fig. 2) because of the much greater length of dams and volume of dam fill needed to achieve required pond volume. Impacts on vegetation would be similar at the various sites and directly proportional to the area of the ponds.

The alternate sites would have virtually the same impact as the proposed site on the more sensitive species of wildlife, such as deer and raptors. Those mammals and birds least affected by development, such as small birds and rodents, would be affected only by the difference in area covered.

Table 3.--Summary of alternative transportation and utility routes

[see figure 11]

Facility	Right-of-way or site (acres)	Surface disturbance (acres)
Railroad spur, route E	142	142
Railroad spur, route F	99	99
Railroad spur, route G	155	155
Powerline, near or parallel to rail spur E	76	8
Powerline, near or parallel to rail spur F	73	8

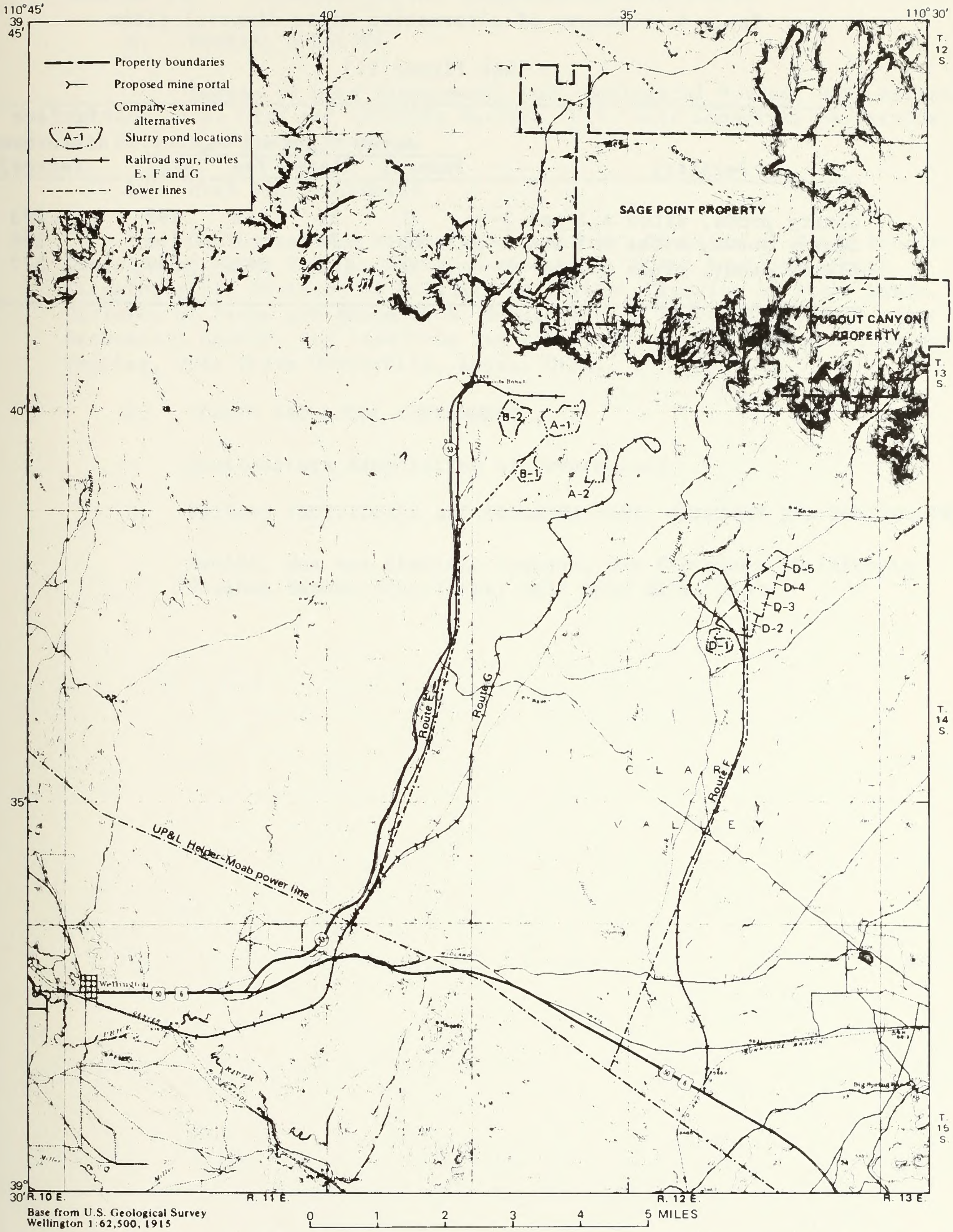


Figure 11.--Map showing alternative railroad and powerline routes and coal slurry pond sites for development of the Fish Creek and Dugout Canyon properties.

Table 4.--Summary of alternative waste disposal sites

[see figure 11]

Facility	Acres right-of-way Federal	State	Fee	Total	Surface disturbance (acres)
Slurry ponds, sites A 1 and 2---	0	55	138	193	193
Slurry ponds, sites B 1 and 2---	92	74	0	166	166
Slurry ponds, sites D 1-5-------	0	115	262	377	377

CHAPTER IX: CONSULTATION AND COORDINATION WITH OTHERS

A. FEDERAL AGENCIES

Bureau of Land Management, U.S. Geological Survey, USDA Forest Service, U.S. Fish and Wildlife Service, U.S. Soil Conservation Service, and National Weather Service.

B. UTAH STATE AGENCIES

Geological and Mineralogical Survey, Division of Water Resources, Division of Water Rights, Division of Health, State Engineer, State Climatologist, Division of Wildlife Resources, Division of State Lands, Division of Parks and Recreation, Department of Transportation, Outdoor Recreation Agency, and Institute for the Study of Outdoor Recreation and Tourism, Utah State University, Logan, Utah.

C. COUNTY AND LOCAL GOVERNMENT

Southeastern Association of Governments

D. PRIVATE INDIVIDUALS AND ORGANIZATIONS, INDUSTRY AND NONINDUSTRY

Pacific Gas and Electric Company, San Francisco, California
Vaughan Hansen Associates, Salt Lake City, Utah

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.

Bray, O. E., and Barnes, V. G., 1967, A literature review on black bear populations and activities for National Park Service: Colorado Coop. Wildlife Research Unit, 34 p.

Bureau of Land Management, 1977, Final environmental statement - Emery Powerplant: Salt Lake City, Utah.

Clark, F. R., 1928, Economic geology of the Castlegate, Wellington, and Sunnyside quadrangles, Carbon County, Utah: U.S. Geological Survey Bulletin 793, 165 p.

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 inhabits 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 Geological and Mineralogical Survey Monograph, series 3, p. 245-416.

Dunrud, C. R., 1976, Some engineering geologic factors controlling coal mine subsidence in Utah and ColoradoL U.S. Geological Survey Professional Paper 969, 39 p.

Ellis, D. H., Smith, D. G., and Murphy, J. R., 1969, Studies on raptor mortality in western Utah: The Great Basin Naturalist, v. 29, no. 3, p. 165-167.

Environmental Research and Technology (ERT), 1978, Regional statement - Component for the southwest Wyoming coal development; environmental statement - Climate and air quality section: ERT Document P-3661-B.

Fair, J. S., 1977, Utah black bear harvest, 1976-77: Utah Division of Wildlife Resources, Publication No. 77-9, Federal Aid Project W-65-R-D-25, Job A7.

Geertsen, R. Loney, M., and Yun Kim, 1977, Local perceptions of community life in rural Utah: Utah Science, June 1977, p. 46-51.

Hagihara, J. S., Rice, C. M., and Langan, L. N., 1972, Interim guide for rating soils according to their suitability for rangeland seeding, Nevada: Bureau of Land Management, Technical Note, Filing Code 7312.3.

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

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

Pueschel, R., Allee, R. Z., Wellman, D. L., Roberts, W. F., Wagner, W. W., Thoem, T., 1978, Variabilities in visibility in east-central Utah: (In press.)

Roy Mann Associates, Inc., 1977, Visual resource inventory and evolution of the Central Range and Coal Region of Utah: Report 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 Division of Wildlife Resources. (In press.)

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

Seton, E. T., 1909, The black bear, in Lives of game animals: Boston, Massachusetts, Charles T. Branford Company, p. 119-190.

Skinner, M. P., 1925, Bears in Yellowstone: Chicago, Illinois, A. C. McClurg and Company, 158 p.

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

Utah Division of Wildlife Resources, 1977, Utah big game investigations and management recommendations, 1977, 1978: Publication No. 77-5, Federal Aid Project W-65-R-D-25.

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

McKinnon Mines Nos. 1 and 2

On all or parts of lease Nos. U-0142235, U-0147570, U-044076,
U-020305, and U-073120

Proponent: Routt County Development, Limited

Site Specific Statement

Routt County Development, Limited

McKinnon Mines Nos. 1 and 2

CONTENTS

Page

Page

ILLUSTRATIONS

TABLE

ROUTT COUNTY DEVELOPMENT, LIMITED

MCKINNON MINES NOS. 1 AND 2

CHAPTER I: DESCRIPTION OF PROPOSED ACTION

A. INTRODUCTION

Routt County Development, Ltd., a subsidiary of Energy Fuels Corporation, submitted plans in April and November 1976 to mine 3.5 million tons of coal annually from two underground mines involving the same Federal leasehold (fig. 1; all or parts of Federal lease Nos. U-0142235, U-0147570, U-044076, U-020305, and U-073120). The pending Federal action is approval of the proposed mining and reclamation plan within the limits of the lease area. This environmental statement details the impacts of this mining proposal.

The Company has also submitted preliminary, conceptual plans for activities such as transportation, utility and other facilities that will be needed before the mining plan can be fully implemented. Most of these are off the lease area on private land. These activities are only analyzed to the extent of information submitted and to determine the major impacts that eventually may result from approval of the mining and reclamation plan. Future Federal actions and additional environmental assessment may be required when detailed plans for these activities are finalized.

Table 1 summarizes the mining and reclamation plan for which Federal action is pending and preliminary proposals, mostly on private surface, in Eccles and South Fork of Eccles Canyons.

The proposed mines are in Carbon County, Utah about 50 miles northwest of Price near Scofield. McKinnon No. 1 would be in Eccles Canyon and McKinnon No. 2 in the South Fork of Eccles Canyon (fig. 1).

The 6,290-acre leasehold is made up of Federal leases held by sublease from Malcom McKinnon et al., (5,660 acres) and Valley Camp of Utah (560 acres), and a lease from Carbon County (70 acres). Valley Camp of Utah subleased the acreage to Routt County Development, Ltd., to set the boundary between the two companies at the Connelville fault (exact location uncertain) (figs. 2, 3).

A 122 acre Federal withdrawal for the Lawrence Reservoir lies within the bounds of lease U-044076 and is excluded from the mining unit (fig. 2). Lawrence Reservoir was not built; however, at maximum capacity (30,000 acre-feet) Electric Lake overlies about 38 acres of Routt County lease U-044076 (included in the mining unit) and about 65 acres of the withdrawal.

Laws and regulations governing mine development and operations are discussed in detail in the Central Regional EIS, part I, chapter I. Interrelationships between the proposed McKinnon mines and other operating or proposed mining projects in the Scofield-Clear Creek area are also discussed in part 1.

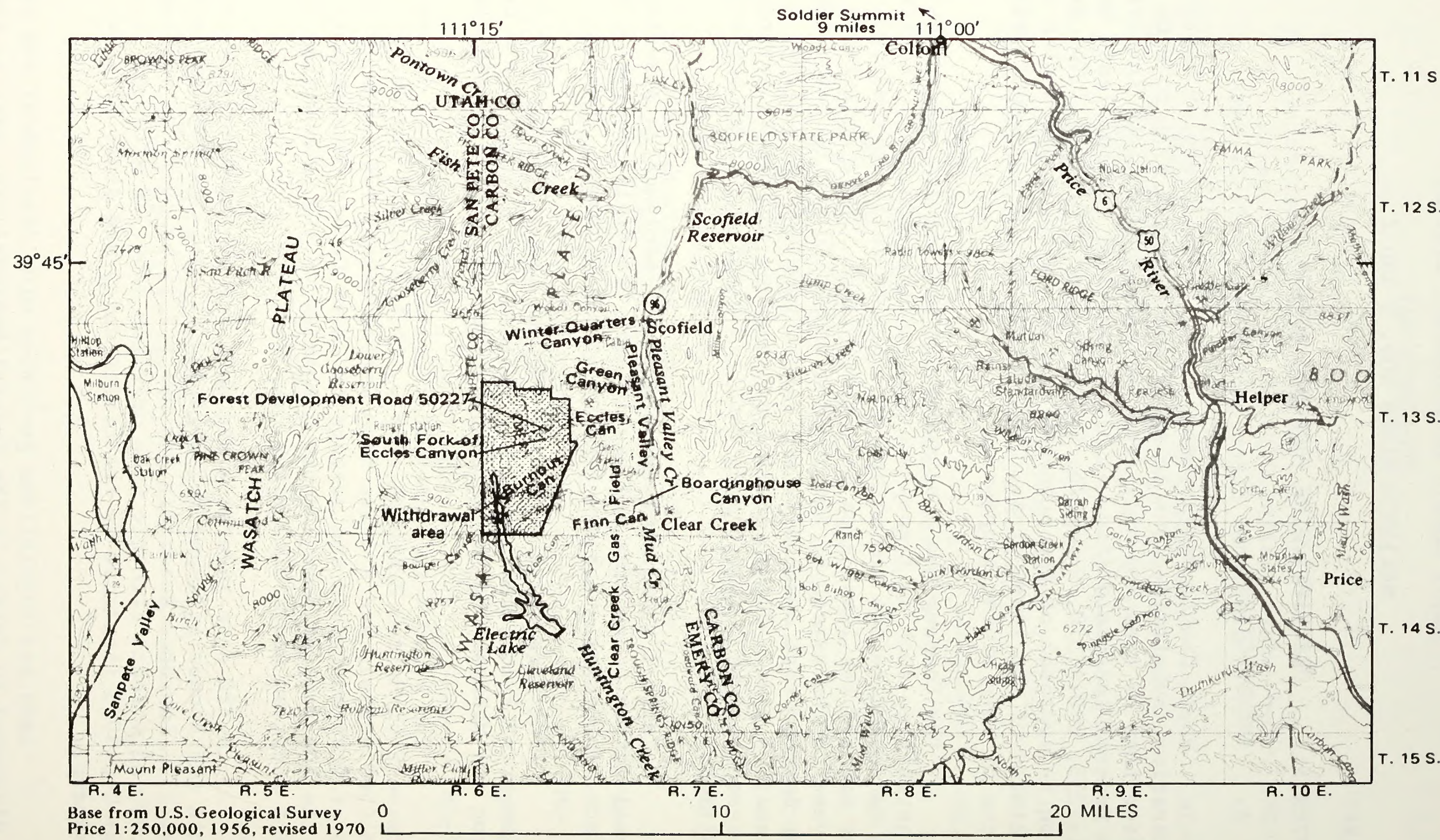


Figure 1.--Index map for McKinnon Nos. 1 and 2 mines, Carbon and Emery Counties, Utah.

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

Area included in mining plans (acres)	
Federal lease area	5,660
Valley Camp of Utah, Inc.	560
Carbon County lease	70
Total	6,290
Poduct	High volatile B bituminous
Market	Unidentified

	No. 1 mine	No. 2 mine	Total
Coal resource, estimated reserves, in million tons			
In place	---	---	263
Recoverable	---	---	131
Seam	Upper O'Connor	Lower O'Connor	---
Expected mine life, in years	35	40	
Production rate, million tons per year	2.5	1.0	3.5
Schedule			
Months until initial production	6	36	---
Months until full production	48	60	---

Ancillary facilities		
No. 1 mine[1]	(a) Access-haul road	2.6 miles
	(b) Powerline	2.6 miles
	(c) Conveyor	2.6 miles
	(d) Telephone line	2.6 miles
No. 2 mine[1]	(a) Access-haul road	0.6 miles
	(b) Powerline	0.6 miles
	(c) Conveyor	0.5 miles
	(d) Telephone line	0.6 miles
Jointly used[2]	(a) 30,000-ton rail coal loadout	
	(b) Parking facility	
	(c) Fenced storage area	

	No. 1 mine	No. 2 mine	Total
Land surface disturbance (acres)[1]			
Portal facilities	25.0	15.0	40.0
Conveyor	4.0	2.0	6.0
Access	13.0	9.0	22.0
Powerline[3]	0	0	0
Fenced storage area	---	---	1.0
Personnel requirements			
Construction workers	75	75	75
Mine workers[4]	725	290	1,015

[1]On federal and private land. No application for federal land area.
[2]On private land.
[3]Acres for powerline included in access right-of-way.
[4]Based on 15 tons per manshift (includes support).

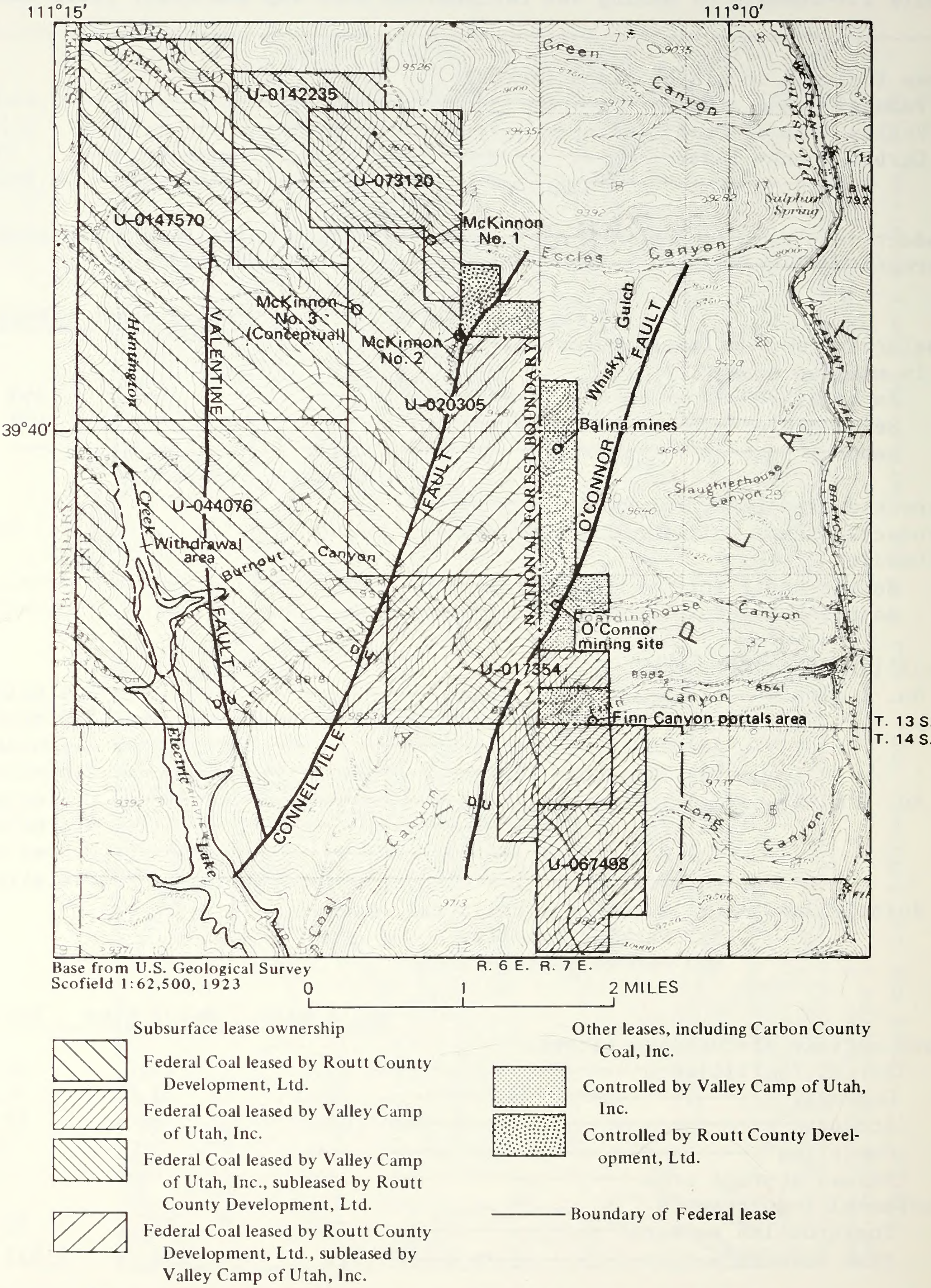


Figure 2.--Map showing subsurface (coal) ownership for McKinnon Nos. 1 and 2 mines, Belina No. 2 mine, and O'Connor mine.

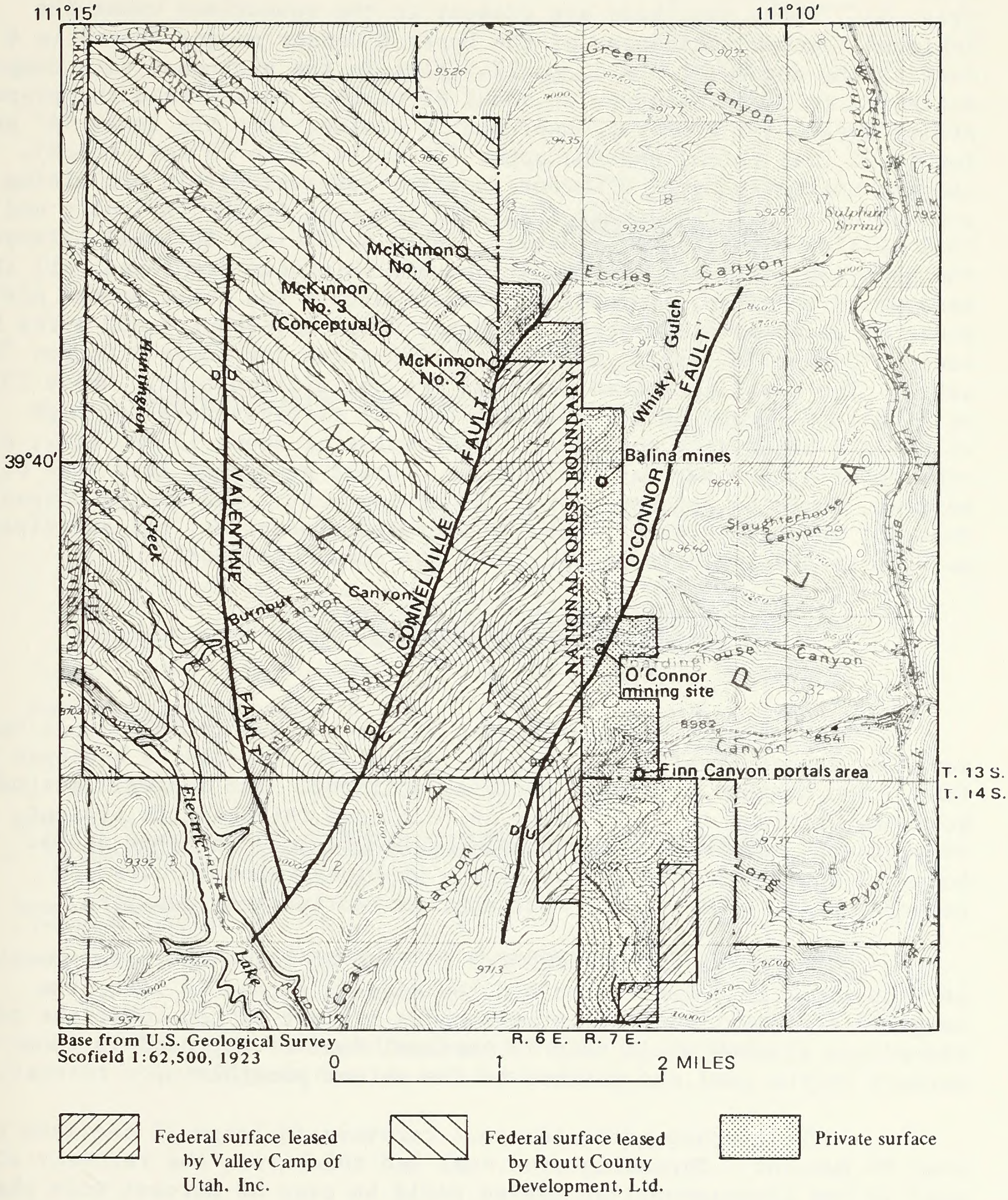


Figure 3.--Map showing surface ownership for McKinnon Nos. 1 and 2 mines, Belina No. 2 mine, and O'Connor mine.

B. PROPOSED ACTION

The company proposes to open two underground coal mines, one each in the Upper and Lower O'Connor beds of the Blackhawk Formation (fig. 4). These coal beds are present in the subsurface under the McKinnon leases. Thickness of the Upper O'Connor ranges from 4 to 6 feet in the northwest and 12 to 17.5 feet in the southeast with company estimated in place reserves of about 86 million tons within the proposed mining area. The Lower O'Connor bed is divided into the lower "A" split (up to 25 feet thick) and the upper "B" split (1 to 23 feet thick). The company estimates Lower O'Connor in place reserves within the mining area to be 177 million tons; 107.7 million tons in the "A" split and 69.2 million tons in the "B" split. When sufficient interval between the beds (30 feet) and minimum 4-foot bed thickness are found, all three beds would be mined. Company isopacks indicate the superimposed mining areas to be about 5,350 acres for Upper O'Connor, about 4,850 acres for Lower O'Connor "A" split, and about 3,600 acres for Lower O'Connor "B" split. The total estimated reserves are 263 million tons. About 131 million tons (based on a 50 percent overall recovery rate) of high volatile B bituminous coal with a heat value of about 13,000 Btu., ash content of 4 to 8 percent, and sulfur content generally less than 0.5 percent, would be recovered from the mining unit. The mining company does not identify a market for the proposed production, but anticipates markets to develop with growing national demand for coal.

1. PROPOSALS PENDING FEDERAL ACTION

a. McKinnon No. 1

The mining proposal states that the Upper O'Connor coal bed would be opened by six main portals, two of which would be equipped with fans. Two systems of mining would be utilized. The longwall method would be utilized in areas where uniform coal thickness is present, and conventional room-and-pillar methods would be used in other areas. Longwall equipment, continuous mining machines, shuttle cars and conveyor belts would be used for coal extraction and transport.

Where bed thicknesses are 10 feet or less, the total vertical section would be taken. When bed thicknesses exceed 14 feet, the longwall equipment would take as much as 14 feet of top coal; the room-and-pillar systems would take 10 vertical feet of top coal in rooms and extract bottom coal and pillars to the extent possible upon retreat.

The company estimates coal recovery in longwall sections to be over 80 percent. Depending upon coal bed thickness, the recovery of coal in the room-and-pillar system could be over 60 percent with the pulling of pillars on retreat from the mining panels. Overall recovery rates experienced in similar Utah underground coal mines generally average about 50 percent.

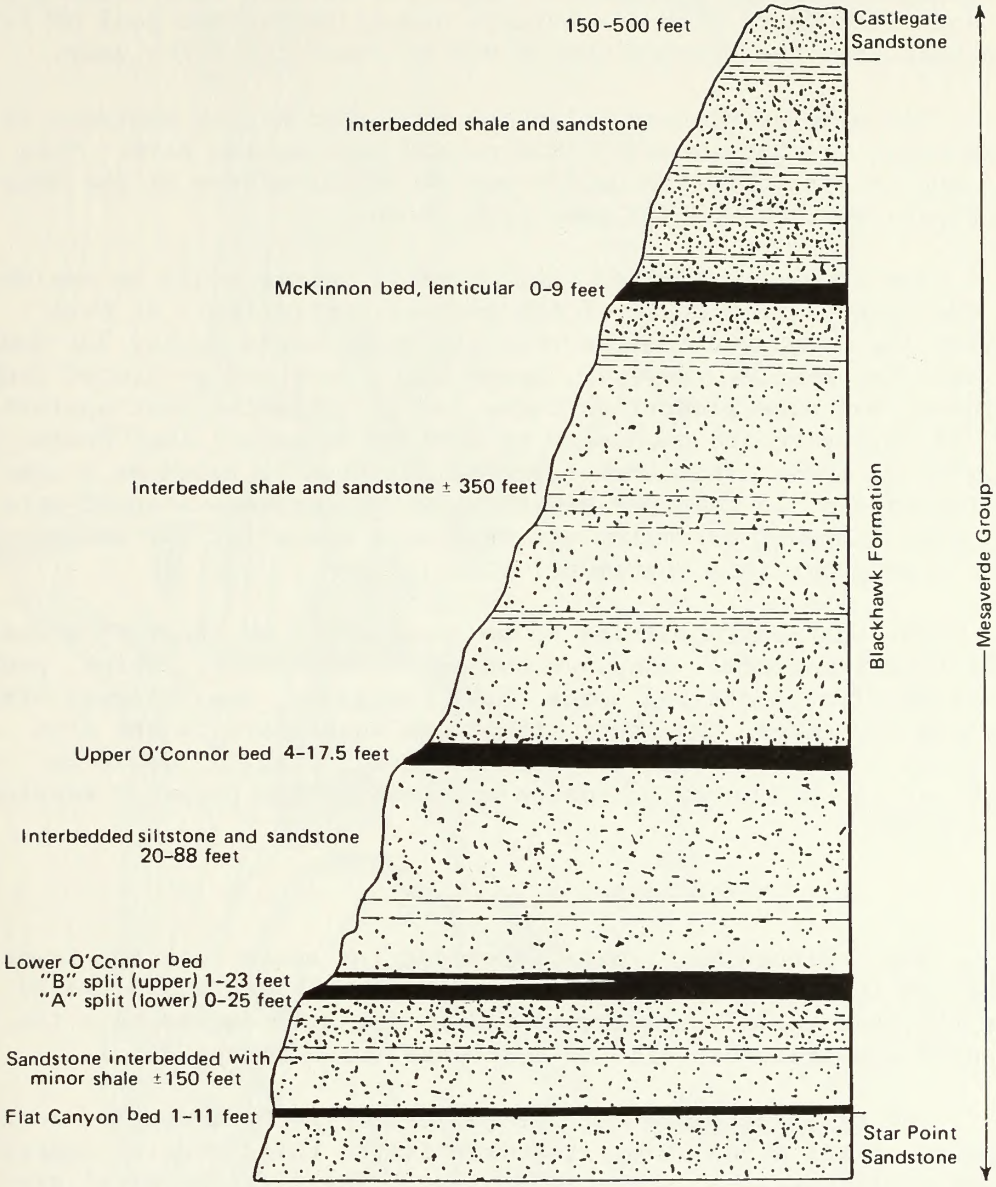


Figure 4.--Generalized stratigraphic section, McKinnon Nos. 1 and 2 minesites.

The proposed production schedule for the McKinnon No. 1 mine, Eccles Canyon site, anticipates taking about 1 million tons the first year. Production would increase to about 1.9 million tons between the fourth and fifth years with an ultimate annual production goal of 2.5 million tons from the Upper O'Connor bed by about the sixth year.

The mine development plan and projected mining sequence is given in detail in the submitted mining and reclamation plan. This information is available for public review in the office of the Area Mining Supervisor, USGS, Salt Lake City, Utah.

The company estimates that about 75 people would be employed during the construction phase of the surface facilities. At full production the company estimates that the mines would employ 331 hourly and 56 salaried people. However, based on current and projected Utah underground coal mine production rates, it is estimated that approximately 725 employees are necessary to achieve an annual coal production of 2.5 million tons. This work force calculation is based on a coal production rate of 15 tons per manshift, which includes support personnel. These latter manpower estimates are used as a basis for all socioeconomic comments throughout this statement.

The surface facilities to be constructed on about 25 acres of National Forest include: shop and bathhouse, warehouse, office, parking area, sewage plant, settling ponds, coal conveyors, coal storage bins for loading and surge, and other structures auxilliary to the mine portal (fig. 5). Forest Service Road No. 50227 (fig. 1) would be realined out of the Canyon bottom to accommodate the proposed service facility area.

b. McKinnon No. 2

The McKinnon No. 2 mine, proposed for entry into the Lower O'Connor bed in the South Fork of Eccles Canyon (figs. 1, 2), would utilize the same portal arrangement and mining methods and have the same anticipated coal recovery rate as described for McKinnon No. 1.

The proposed production schedule for the McKinnon No. 2 mine anticipates taking about .6 million tons in the third year of operation and about 1 million tons in the fifth year. The first 5 years' production would come from the "B" split.

The mine development plan and projected mining sequence is given in detail in the submitted mining and reclamation plan. This information is available for public review in the office of the Area Mining Supervisor, USGS, Salt Lake City, Utah.

The company estimates about 75 people would be required in the construction phase of the project. When in full production, the company projects a manpower requirement of 137 hourly and 28 salaried employees.

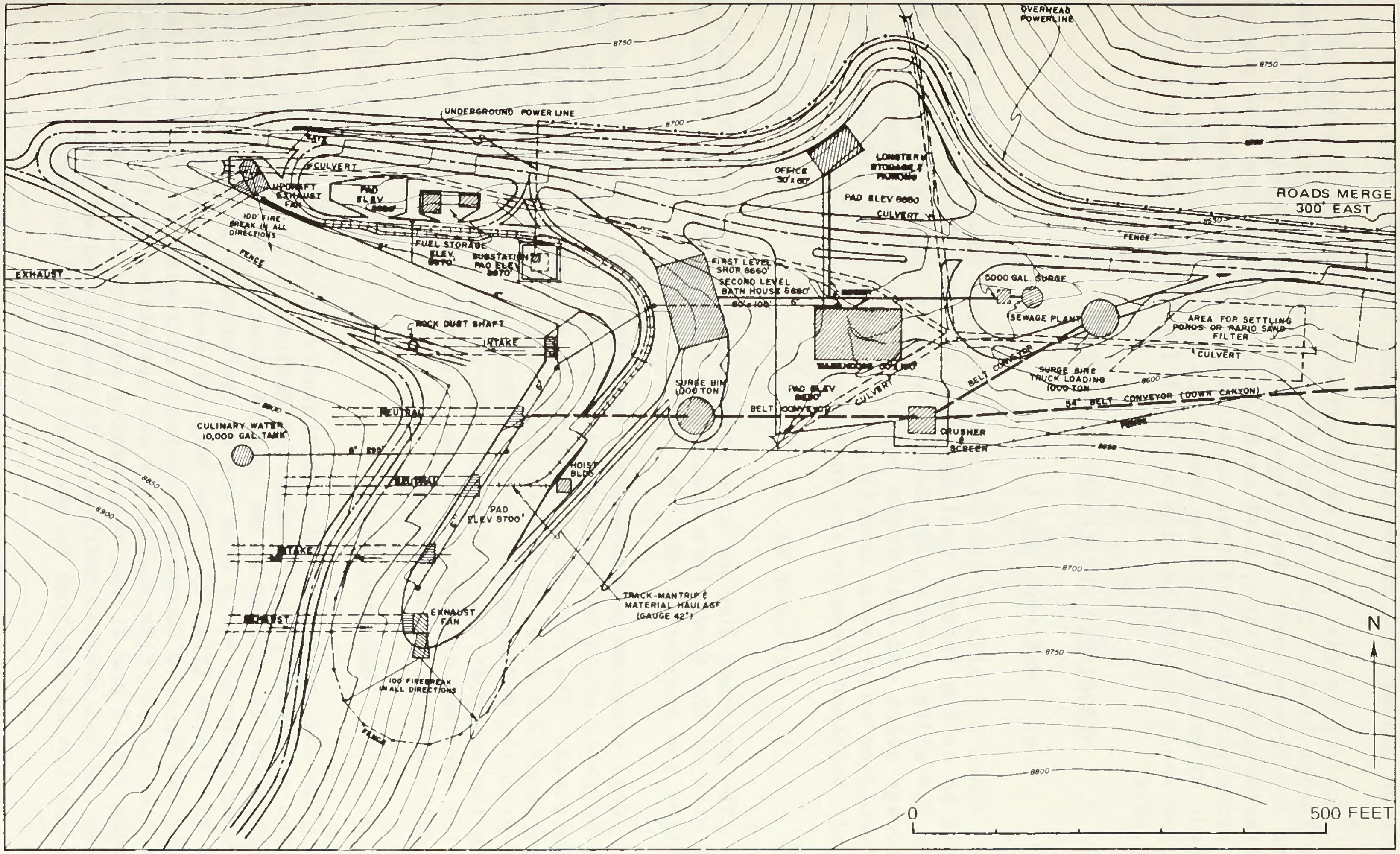


Figure 5.--Map showing proposed surface facility site for the McKinnon No. 1 mine, SW¼ sec. 13, T. 13 S., R. 6 E.

Using the manpower equivalency factor described under McKinnon No. 1, it is estimated that 290 employees, including support, would be necessary to achieve an annual coal production of about 1 million tons.

Surface facilities to be constructed on about 15 acres of National Forest land at the proposed McKinnon No. 2 minesite are shown on figure 6. Access roads, buildings, water system, settling ponds, sewage treatment facilities, coal handling structures, and mine portals are the principal facilities that would be constructed. About 40,000 cubic yards of material would be removed to establish the pad for mine portals and would be used as fill material for the access road and building sites.

2. ASSOCIATED ANCILLIARY FACILITIES

a. McKinnon No. 1

About 0.2 mile of the proposed overland conveyor and access road would be on the Federal coal lease on National Forest land. The remaining 2.4 miles, down Eccles Canyon to State Highway 96 and the proposed storage silos and unit train loading facilities in Pleasant Valley, would be on private land (fig. 7). The company did not furnish details of proposed conveyor and road realinement.

b. McKinnon No. 2

The proposed 20-foot wide paved access road would be built on the west side of the South Fork drainage 0.6 miles along the course of the existing low standard road (fig. 7).

Coal would be moved from the mine mouth by conveyor to a surge bin from which it would be transported by a conveyor to a crushing and screening plant. The coal would continue by 42-inch overland belt conveyor, about 0.5 mile, to Eccles Canyon where it would join the main conveyor from the McKinnon No. 1 mine. The entire overland conveyor servicing the McKinnon No. 2 mine would be on private property. Figure 7 shows the proposed conveyor route to a planned coal loading facility at the railroad in Pleasant Valley.

c. McKinnon No. 3

The company presented a preliminary proposal giving general information on future plans to mine the McKinnon coal bed. This additional operation is planned to be located about 2,300 feet southwest of the proposed McKinnon No. 1 mine and is tentatively identified as the McKinnon No. 3 mine (fig. 2). The McKinnon coal bed lies 325 to 425 feet above the Upper O'Connor and contains estimated in place reserves of 15 million tons. Mine facilities and operations would be developed at McKinnon Nos. 1 and 2, and when mining advances to the area where this upper bed has minable thickness, it would be mined ahead of the lower operations as required by the U.S. Geological Survey.

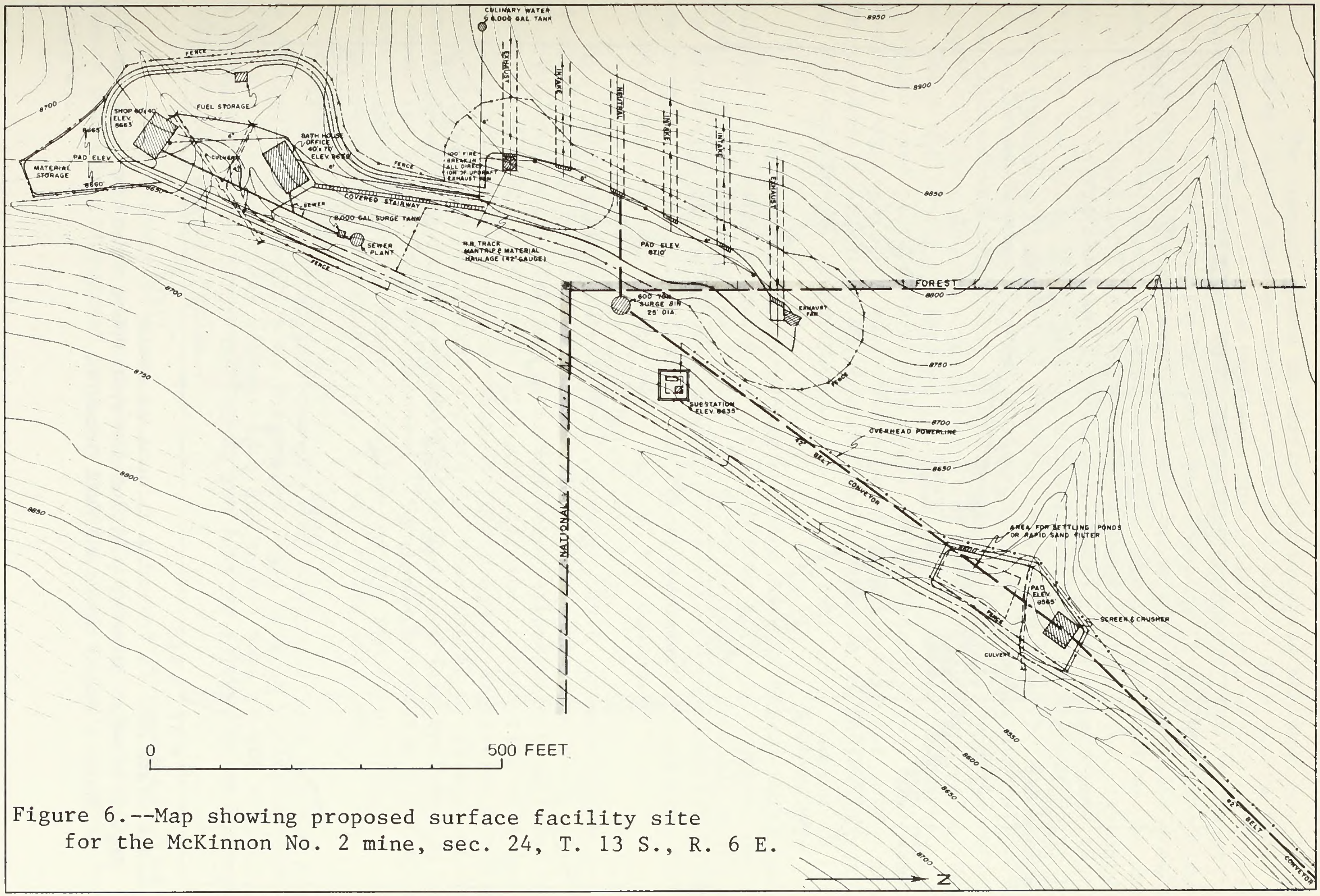


Figure 6.--Map showing proposed surface facility site for the McKinnon No. 2 mine, sec. 24, T. 13 S., R. 6 E.

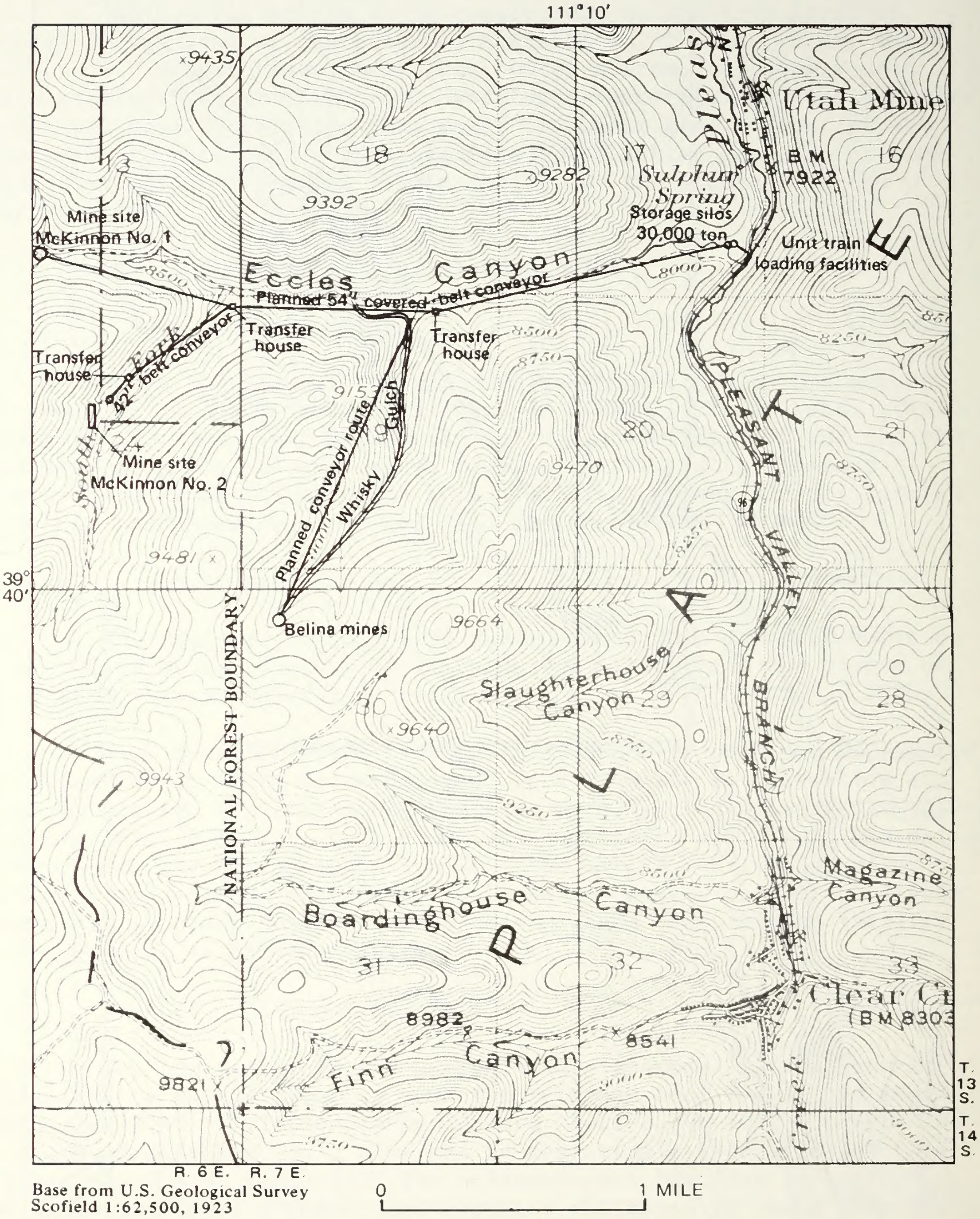


Figure 7.--Map showing planned conveyor route from the McKinnon Nos. 1 and 2 mines to rail loadout.

d. Joint Facilities

The company plans to service the proposed McKinnon No. 1 and No. 2 mines with a master conveyor (54-inch belt), main access road, and utilities along a 2.4 mile privately controlled right-of-way up Eccles Canyon from State Highway 96 to the Forest boundary (fig. 7). The additional 0.2 mile to the McKinnon No. 1 portal is on the Federal coal lease on National Forest land and would be part of the on-lease development that would require Federal approval. The private land on the north side of Eccles Canyon from Highway 96 to the National Forest boundary is controlled by Valley Camp of Utah and a gravel road, main access to their Belina No. 1 mine, extends about 1.2 miles from Highway 96 to Whisky Gulch. A planned coal conveyor on private land for the Belina No. 1 mine would come into Eccles Canyon at Whisky Gulch and follow the road right-of-way to Highway 96 and proposed unit train loading facilities (fig. 7). Routt County Development plans to negotiate with Valley Camp for joint use of the designated route to locate their coal conveyor, utilities, and paved main access road. Routt County Development also plans to negotiate with Valley Camp for a 1.2 mile right-of-way to carry the services from Whisky Gulch along the north side of Eccles Canyon to the National Forest boundary.

The proposed right-of-way location west of Whisky Gulch has only been described as being on the north side of Eccles Canyon; however, the company-supplied graphic (fig. 7) depicts a possible route on the south side of the canyon. Should rights-of-way be unattainable on the north side of Eccles Canyon, the company would then negotiate for private rights-of-way on the south side of the canyon.

Mining plans submitted in November, 1976 included plans to obtain power for both McKinnon mines from the Castle Gate Plant (fig. 8). Valley Camp of Utah has completed negotiations with Utah Power and Light Co. (UP&L) to do engineering work for the construction of a new 46 kV line from the plant via Gordons Canyon to a main substation north of Clear Creek. Line construction costs would be shared by several mining companies. Energy Fuels has requested UP&L to complete engineering for a powerline to run from the proposed Clear Creek substation north along State Highway 96 to the mouth of Eccles Canyon, and from there, up Eccles Canyon to the McKinnon Nos. 1 and 2 sites (fig. 8).

A three-quarter acre fenced, open air, materials storage area is planned at the junction of Eccles and South Fork of Eccles Canyons (fig. 8). The materials storage area and access road to the McKinnon No. 2 mine would be built over about 300 feet of culvert in South Fork and about 125 feet in Eccles.

The company proposes to acquire property at the mouth of Eccles Canyon near the planned loading facilities for a parking lot. Miners would be transported from the parking area to both mines by bus (fig. 7).

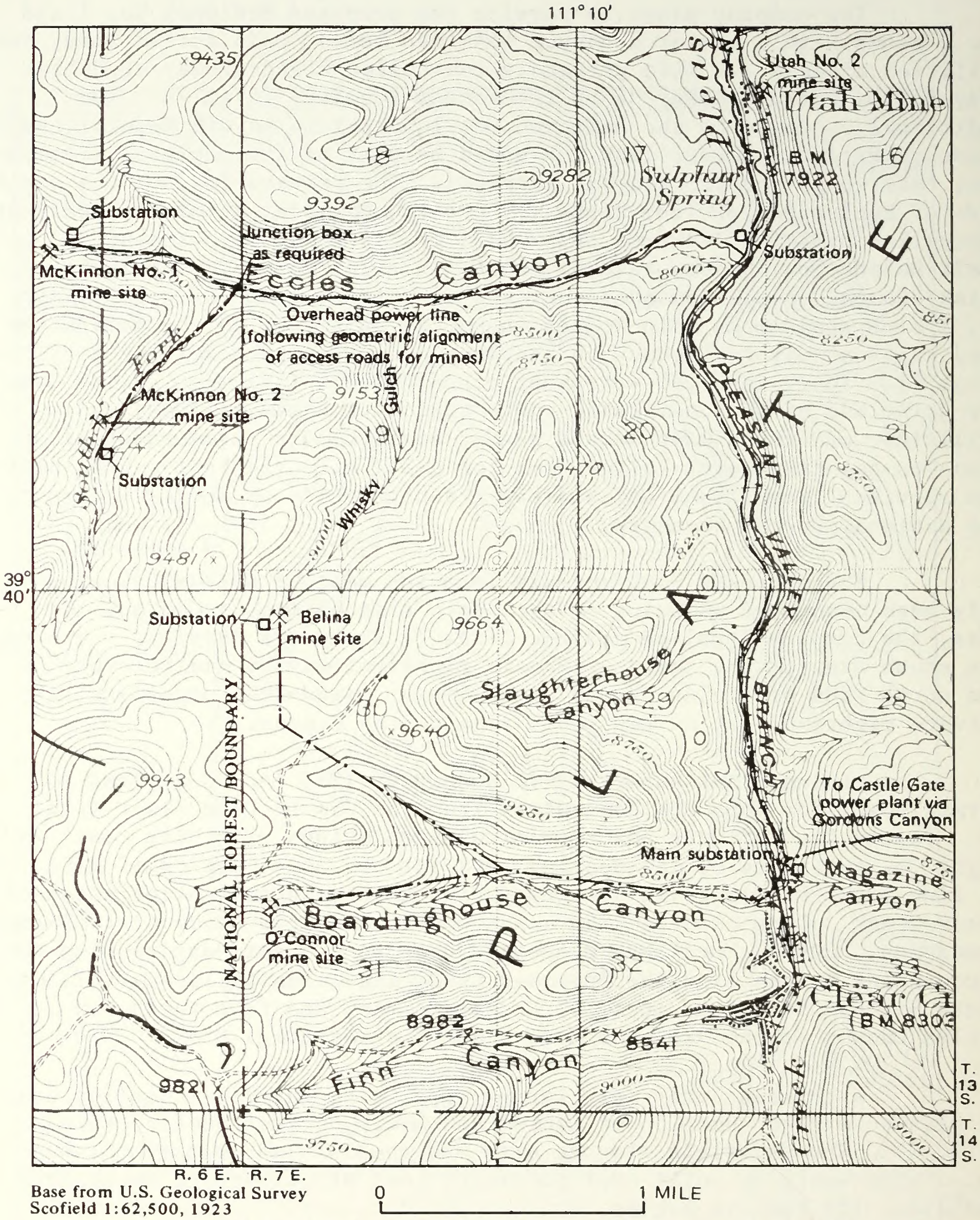


Figure 8.--Map showing proposed powerline route to McKinnon Nos. 1 and 2, Belina, and O'Connor minesites.

The company does not own water rights and does not estimate the quantity of water needed for operations. They plan to purchase water shares in Scofield Reservoir from the Price River Water Users' Association and exchange the shares at the Utah Division of Water Rights, State Engineer's office, for the right to drill water wells near the proposed mine sites. Should any existing leasehold springs be developed, the company would have to negotiate and obtain existing stockwatering rights.

The USDA Forest Service (USFS) opposes the point of diversion in Eccles Canyon. They have filed a formal protest, based on 30-acre feet of water being diverted from Eccles Creek, to maintain sufficient stream flow for other needs.

C. ENVIRONMENTAL PROTECTION AND RECLAMATION

The company has proposed the following reclamation procedures and they will be included as stipulations should the mining plan be approved.

Topsoil removed during construction would be stored and eexcavated rock overburden would be used as fill material for access roads and building sites. The topsoil would be used as soon as possible to restore (replant native grasses, shrubs, and trees) any disturbed areas not necessary to operations or required for firebreaks. The prompt restoration of disturbed areas and the use of covered conveyors and paved roads would be instrumental in dust control.

Stream flow would be protected near proposed facilities by installing properly sized culverts with concrete or rip-rap end dams in accordance with Forest Service flood design criteria. Siltation and settling ponds, constructed to meet respective USFS and State Engineer's Office specifications, would protect natural water courses from any contaminated mine waters or run-off from portal areas and sewage treatment facilities would be designed to prevent human wastes from entering either the surface or ground-water systems. Water quality would be monitored for at least 1 year at the McKinnon No. 2 and throughout the proposed mining operations at McKinnon No. 1 by taking physical, chemical, radiological, and bacterial parameters as used by State agencies and the Environmental Protection Agency. Any changes in water quality would necessitate a study of possible causes and remedial action. The superintendent of the mine, or a responsible person appointed by him, would be responsible for notifying the USGS mining supervisor by telephone of any accident which might cause air or water pollution, along with corrective actions initiated. A report would be submitted within 30 days detailing damages and any corrective actions taken.

Solid refuse would either be trucked to the existing sanitary landfill area near Clear Creek or be buried in a new landfill system to be constructed by the mining company. No site has been designated or information given on a new landfill location.

Coal pillars would be left for support under any gas pipe lines in the mining area (fig. 9). Undisturbed pillars of coal would be left to protect drill sites should any be proposed prior to mining.

Upon final abandonment of the mine, all building, power facilities, and ventilation systems would be removed. The disturbed surface would be backfilled and contoured to be as near as possible to the original configuration. The mine portals would be blocked and sealed. Stored topsoil would be replaced and reseeded, using mulches and fertilizers to hasten growth. Reseeding with a combination of introduced and native species would utilize two types of plants: shallow fibrous-rooted varieties of fast growing grasses, such as Beardless wheatgrass or intermediate wheatgrass, and those with tall branch-covered stems, such as native big sagebrush or bitterbrush. This combination of plants would help hold the soil in place and prevent erosion caused by the impact of raindrops. Three types of trees would be planted: spruce, fir, and aspen.

Standard earth-moving equipment such as caterpillar tractors, draglines, loaders, and dump trucks would be used to reshape the landform, and agricultural implements, such as harrows and disks, would be used to prepare seed beds. Irrigation spraying would be used initially to aid the plantings in the early stages.

D. LEGALLY ENFORCEABLE MITIGATIONS

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 and Reclamation Act (SMCRA) of 1977 (PL 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, in this statement the applicable initial regulations are considered as a required Federal mitigating measure.

The mining and reclamation plans will be returned to the operator together with a request that they be revised in accordance with the applicable initial regulations. As soon as the mining and reclamation plans are revised and returned to the Geological Survey (USGS) they will be evaluated with the Office of Surface Mining to determine compliance with the requirements of Federal regulations at 30 CFR 211 and 30 CFR 700. The mining and reclamation plans cannot be approved until they conform to all applicable requirements.

Total mining operations will be conducted in accordance with Federal and State laws and regulations. Mining and reclamation plan approval will contain stipulations to protect the existing leasehold gas pipeline (fig. 9) from subsidence, protect that portion of Electric Lake which overlies Routt County lease U-044076 (fig. 2), and protect any oil or gas drill sites. The McKinnon coal bed will not be undermined without approval by the Area Mining Supervisor. Also, mine operations

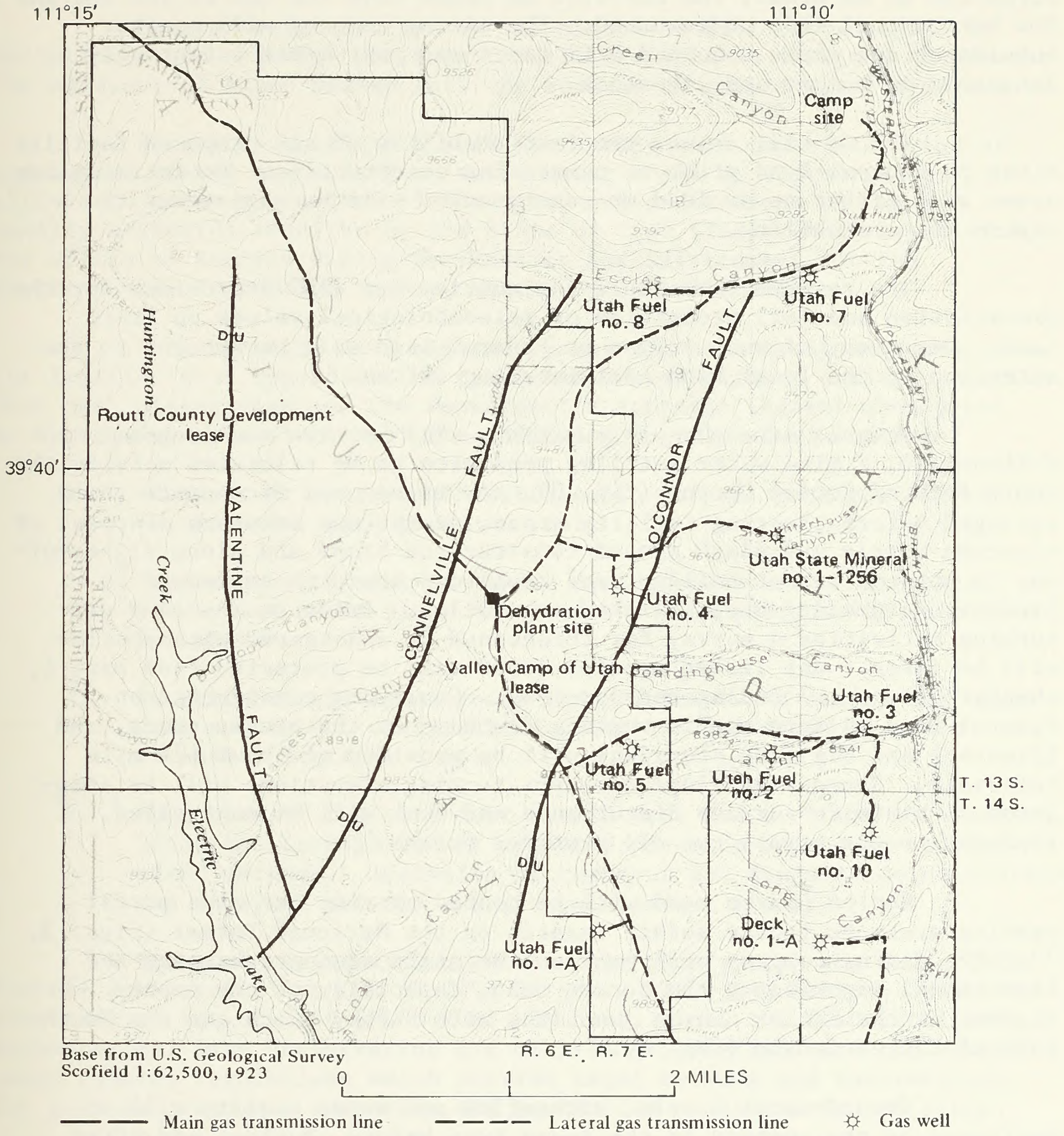


Figure 9.--Map showing gas lines and wells in the McKinnon Nos. 1 and 2, Belina No. 2 and O'Connor mining areas.

will be sequenced to insure maximum coal recovery and where longwall mining is employed, the mining face, where feasible, will be alined and advanced in directions relative to the topography shown by research studies to produce the least amount of surface deformation. Where a bed exceeds 14 feet in thickness and is the lowest bed in the Blackhawk Formation to be mined, the cut will be taken from the top of the bed and the bottom coal left undisturbed. The mining company will monitor subsidence and where required will fence and post areas potentially dangerous to humans and livestock.

The GS will assess the land stability of all proposed facility sites on Federal land prior to commencing construction. Potential slide areas will either be avoided or construction will be engineered to assure slope stability.

The revised Utah State Antiquities Act (1977) provides for the preservation and (or) protection of paleontological values on State land. Discovery of wuch values on Federal land will be brought to the attention of the local land administering office.

Federal mine plan stipulations will require the proposed McKinnon No. 2 mine water settling pond site to be relocated outside the South Fork of Eccles Canyon (fig. 3), saw timber and fenceposts to be salvaged before clearing facility areas, prompt and complete disposal of clearing debris and slash around construction areas and along rights-of-way to prevent insect buildup, and reclaimed areas to be fenced to prevent overgrazing unestablished vegetation. Prior to any land disturbing activities a survey for threatened or endangered plan species will be taken. Any listed species found will be protected (see part 1, chapter III, No. 7 Endangered Species). Conveyors constructed on Federal land will be within working distance of the access roads, and livestock and big game crossings will be provided at about 1/4-mile intervals. Steep side-slope conveyor footing elevations will be staggered to minimize surface disturbance and dust will be controlled, including water sprays, at all transfer points.

Eccles Canyon road will be routed outside the mine portal working areas to reduce safety hazards on the National Forest (figs. 3, 7). The mining company will post and maintain adequate warning and directional signs along the access road, especially on the county segment at the Eccles Canyon junctions with Whisky Gulch and the South Fork of Eccles Canyon (fig. 7).

Ground-water levels, streamflow and water quality will be monitored by the company in the lease area before, during, and after development to determine the effect of the mining operations on the hydrologic environment. Similarly, air quality will also be monitored. Measurements of physical, chemical, radiological, and bacterial parameters as used for evaluating water quality by State agencies, the Environmental Protection Agency, and the Office of Surface Mining Reclamation and Enforcement will be taken. Mine test borings could be so constructed to serve as groundwater monitoring stations. Dewatering of the mine shall be conducted such that water will not be diverted from one basin to another; excess water encountered under the Huntington Creek watershed will be pumped to the Huntington Creek watershed three miles upstream from Electric Lake (fig. 1).

Natural water courses in the mine area will be protected by siltation ponds. Sewage treatment facilities will be designed to prevent the entrance of human wastes into the surface or ground-water system.

No wastes shall be placed where they will cause pollution of any waters of the state, and no waste water shall be discharged or allowed to enter any waters of the state unless it meets the water quality standards required by the State of Utah (Title 73-14-1, et al.), the Office of Surface Mining Reclamation and Enforcement, or the Environmental Protection Agency, whichever is applicable.

Each 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 should use an appropriate combination of the following fugitive dust controls:

1. Pavement or equivalent stabilization of all haul roads used or in place for more than one year.

2. 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.

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

4. 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.

The authorizing office (BLM) would comply with the basic 1906 Federal Antiquities Act (PL 59-209; 34 Stat. 225), the National Historic Preservation Act of 1966 (PL 89-665, 80 Stat. 915), the Historical and Archeological Data Preservation Act of 1974 (PL 93-291), and the subsequent Federal regulations which provide legal backing and instructions for cultural resource inventory and protective consideration of sites.

No mining or rights-of-way will be approved until the surface management agency has coordinated professional cultural resource (cultural resources include archeological, architectural, and historical remains) surveys with the Utah State Historic Preservation Officer and received his written comments, and review. Additional surveys and mitigation may be necessary if surface evidence indicates further evaluation is necessary. In the event of discoveries of buried cultural resources as the result of exploration or mining activities, the operator will notify the GS and the surface management agency immediately and suspend operations.

CHAPTER II: DESCRIPTION OF THE EXISTING ENVIRONMENT

A. NATURAL ENVIRONMENT

1. CLIMATE

The general climate of the area is described in part 1, chapter II. Average monthly temperatures at the proposed minesite range from 15° F in January to 60° F in July. Extreme temperatures are about -40° and 80° F. Average annual precipitation is 25-30 inches, including 8 inches of rainfall from May to September. Potential evaporation is 30-35 inches per year. Snow generally falls from October through May, and snow accumulation averages about 4 1/2 feet. Maximum snow depth expected is 9 feet.

2. LAND

a. Land Surface

The physiographic setting of the McKinnon minesites is in the northern end of the Wasatch Plateau (fig. 1). The general plateau surface is rugged to rolling and attains elevations in excess of 11,000 feet giving it a mountainous aspect. The proposed minesites are located in Eccles and South Fork of Eccles Canyons (fig. 7). The east side of the plateau terminates in a great erosional scarp that is marked by steep walled canyons and long reaches of vertical cliffs. On the west, the plateau terminates in a great monoclinal fold that dips steeply into the Sanpete Valley (fig. 1).

b. Geology and Mineral Resources

The minesites are located on the west flank of the Clear Creek Anticline where bedrock dips average 4° westward, but locally may range from 2° to 8°. Coal occurs in alternating shale and sandstone beds in the lower one-third of the 1,500-foot thick Blackhawk Formation. The 1,000-foot thick Starpoint Sandstone lies beneath the Blackhawk and about 750 feet of undifferentiated Castlegate Sandstone-Price River Formation overlies it across about 400 acres in the northwest corner of the lease area; all members of the late Cretaceous Mesaverde Group (fig. 4). The company overburden map shows the Upper O'Connor bed to be 800 to 1,000 feet deep over most of the leasehold with overburden thickness reaching 1,800 feet in the northwest corner of the lease.

Most bedrock on the mining unit is covered by soil and vegetation (fig. 10). The steep slopes (about 400 acres) on the east side of Huntington Creek north of Burnout Canyon and west of the Valentine fault (fig. 2) are dormant landslide areas (oral commun., Roger Colten, February 5, 1978). A 35-acre landslide has been identified along the south side of Eccles Canyon extending about 650 feet either side of the Forest boundary (fig. 2) and a 200-foot wide slump has been identified

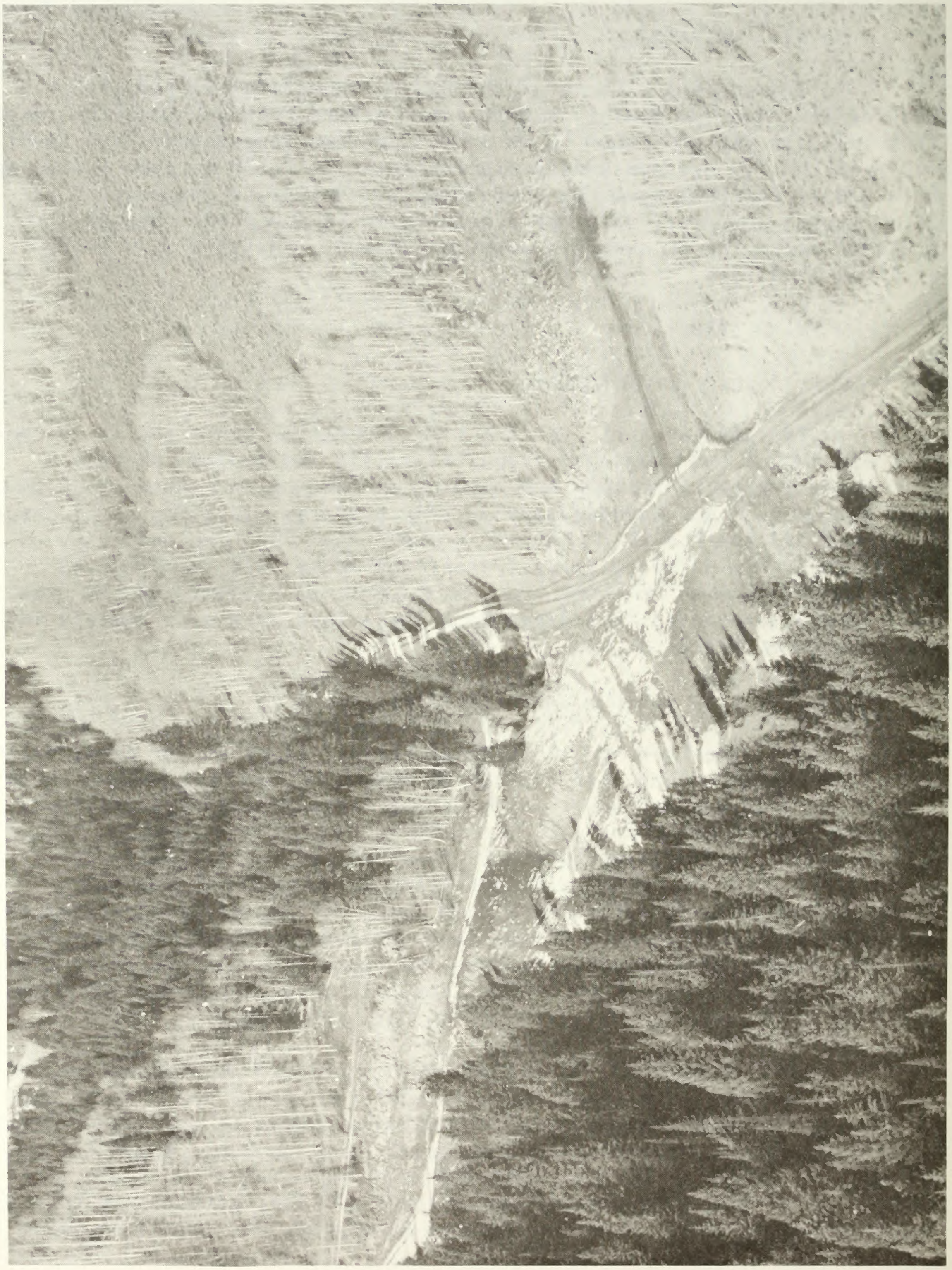


Figure 10.--Western view of McKinnon No. 1 mine portal area. Soil depth can be inferred from the roadcuts at the left of the photograph.

near the No. 1 portal along the north side (written commun., W. H. Boley, Acting Forest Supervisor, February 17, 1978). The latter slump area may extend down the canyon to the Forest boundary (about 3,900 feet).

The area in general is cut by numerous steeply dipping normal faults. The largest of these is the Pleasant Valley fault that strikes north-south and borders Pleasant Valley on the west. Displacement of this fault is on the order of 1,000 feet, the east side being down-dropped. Figure 2 shows the position of three major faults in the immediate vicinity of the proposed McKinnon mines. They are the O'Connor, Connelville, and Valentine faults, all are downdropped to the west. The Connelville fault is located immediately east of the proposed McKinnon No. 2 entry and marks the east boundary of coal to be taken by the McKinnon mines (fig. 2). Displacement on the Connelville fault is about 190 feet at the south end of the leasehold, but this diminishes to about 75 feet near Eccles Canyon. The Valentine fault, like the Connelville, is downdropped to the west and is the northern extension of a major fault (Speiker, 1931, p. 56). Its displacement is 60 feet in the southern part of the leasehold near Burnout Canyon and dies out in the northern part of the property.

Many minor faults were crossed in both the Winter Quarters and Utah mines (figs. 8 and 10) and a fault with small displacement has been observed near the No. 2 minesite in South Fork of Eccles Canyon (fig. 2). Igneous dikes have intruded the sedimentary section through many of the minor faults and joints and the contacts with coal beds often show natural coking for a few feet. A dike, not evident at the surface, was intersected in a drill hole just east of the Valentine fault and north of Burnout Canyon (fig. 2).

Four coal beds are found within the Blackhawk and are named in ascending order as Flat Canyon, Lower O'Connor, Upper O'Connor, and McKinnon (fig. 4). The Lower O'Connor is split into the "A" and "B" units. The uppermost three coal beds are considered to be of economic importance in the area. The stratigraphic relationship of the coal beds is shown in figure 4. Because of the scarcity of rock exposures, stratigraphic correlation is very difficult. The coal beds pinch and swell and are frequently split causing names to vary from district to district and even mine to mine, but they have been mined at various locations in the general area for a great number of years.

The project area has not been surveyed for paleontological resources. Vertebrate and plant fossil-bearing areas are presented in part 1, chapter II.

The Clear Creek Gas Field was discovered in 1951 (fig. 1). Eighteen wells produced gas from the Ferron Sandstone Member of the Mancos Shale at about 4,700 feet, but none of the wells are located on the McKinnon mining unit. The field produced 135,781 mmcf of gas through January 1978, but only 14,952 mcf in January 1978 as 16 of the wells have been shut-in. Although the field is apparently nearing depletion, it has some potential as a natural gas storage area, and the USGS received an application in August, 1977 to drill at 6,550-foot well. The drill site is outside the McKinnon mining unit.

c. Soils

Soils at the McKinnon Nos. 1 and 2 mines (fig. 3) are in the Canyon and Ridgelands Landtype Association as described in the Soil Resource Inventory, Ferron-Price Planning Unit, Manti-LaSal National Forest (Rapin, 1977). They are in Soil Association No. 1 as identified in Soils of Utah (Wilson and others, 1975) and described in chapter II, part 1. A detailed soil survey of the area has not been conducted.

The dominant soils have developed from sandstone and shale parent materials and occupy very steeply sloping (50-80 percent) ridge sideslopes. They are moderately deep (24 to 40 inches) and have 20 to 60 percent coarse fragments. Surface soils typically have a silt loam to loam texture and subsoils are sandy loam to clay loam. The soil and climatic conditions (about 30 inches of precipitation) are conducive to revegetation success; however, the steep slopes are a limiting factor. Erosion rates would be greatly increased when the soils are exposed. If the soil were exposed for a 100 foot length on a 60 percent slope, the erosion could be increased by a rate of over 20 cubic yards per acre per year.[1]

Along the narrow bottomland of Eccles Canyon the soils are deep and formed from alluvial and old landslide deposits. Seeps are present along the toeslopes near the McKinnon No. 1 minesite (fig. 3).

3. WATER

The 6,290-acre lease (fig. 1) is in the headwaters area and on the divide between two major drainages -- the Price and San Rafael Rivers. On the east side of the divide surface drainage (1,820 acres) is to Pleasant Valley Creek thence to Scofield Reservoir in the Price River Basin; on the west side (4,470 acres) to Huntington Creek in the San Rafael River basin. The area is drained mainly by small perennial streams. Average annual runoff from the lease area is about 10 inches or about 1,500 acre-feet of water to Scofield Reservoir and 3,720 acre-feet to Huntington Creek. Most of the runoff occurs during the snowmelt period, but significant amounts of runoff are also generated by summer cloudburst storms.

Ground-water flow probably follows a pattern similar to the surface-water courses. Estimates of recharge are obtained from USGS report on Belina number one mine (Price, 1976). The amount of ground-water infiltrating the lease area is on the order of 975 acre-feet per

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[1] Estimated using the Universal Soil Loss Equation as outlined by the SCS in EPA-908/4-77-055.

year for Huntington drainage and 385 for Pleasant Valley (fig. 1). Of this, perhaps 245 acre-feet per year and 95 acre-feet per year reach the coal beds in their respective drainage areas.

Perched water in the Blackhawk Formation lies in and above the coal beds in the lease area (fig. 4). The water table is believed to be hundreds of feet below the portal (elevation 8,700 feet) at levels of perennial creek in Eccles Canyon. Water-table springs are mapped in the area but at lower levels (8,000-8,500 feet elevation) in Pleasant Valley and Boardinghouse Canyon (fig. 1). Coal beds dip 4° west and probably are about 700 feet below the level of Huntington Creek near the west side of the lease.

Ground water in the Blackhawk formation is contained in sandstone pores and fractures in shale and sandstone. Fractures in the rocks serve as conduits for ground-water flow. Major faults such as the O'Connor and Connelville faults may be important water conduits and subject to disturbance by mining operations (fig. 2).

Ground water in the Blackhawk and lower formations (fig. 4) generally flows downward through fractures and to some extent along bedding planes downdip to the west. The fracture openings probably diminish with depth, circulation decreases, and ground water becomes more saline. Nevertheless, deep gas wells in Eccles Canyon have penetrated freshwater (310 mg/L dissolved solids) below saline water at depths of 3,865 feet. Well yields were not determined but are probably low. It is not known whether this freshwater has any connection with surface recharge.

a. Water Use

Much of the water yield from the lease area is used for irrigation downstream. Scofield Reservoir, which regulates runoff from the upper Price River basin (fig. 1), has a usable storage capacity of 65,780 acre-feet. Water is released from the reservoir into the Price River for downstream use, mainly irrigation. Annual releases average about 45,000 acre-feet. Streamflow records show that the average annual flow of Huntington Creek (fig. 1) near Huntington (about 35 miles below Electric Lake) is about 70,000 acre-feet. Water in the area of the proposed mine is used for watering of livestock and wildlife, fisheries, recreation, and domestic use. Water supplies for the communities of Clear Creek and Scofield come from surface water in Finn Canyon and springs in Boardinghouse Canyon (fig. 1); domestic use is estimated to be 40 acre-feet per year.

Data on ground-water use are limited. Water use from wells in the Scofield area is estimated at 50 acre-feet per year for mining and domestic use. Saturated beds are not expected to yield more than 50 gal/min from sandstone beds and fractured shale in the Blackhawk Formation.

b. Water Quality

Surface waters in the upper Price River basin are fresh and are generally of the calcium-bicarbonate type (Mundorff, 1972). Chemical analyses of 10 samples collected from Pleasant Valley Creek above Scofield Reservoir in 1975-76 contained dissolved-solids concentrations ranging from 380 to 566 mg/L; nine of the ten samples ranged from 380 to 470 mg/L and only one, at 566 mg/L, exceeded the limit of 500 mg/L recommended by the Public Health Service for human consumption.

Ground water in headwater areas of the mine contain less than 500 mg/L total dissolved solids (Price and Waddell, 1973). However, the salinity increases down basin towards the Green River partly because of diminishing rainfall and increasing evaporation.

4. AIR

Particulates are the only pollutants which might significantly degrade air quality at the McKinnon mines. Increases in concentrations of other pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, and photochemical oxidants would not be insignificant.

Air quality has not been monitored near the site. Estimated annual average background TSP in rural central and southern Utah areas is 20 $\mu g/m^3$ (AeroVironment, 1977). This is significantly below the Federal secondary standard of 60 $\mu g/m^3$. Because of the proximity to existing mines, background TSP would probably be higher than average background total for typical rural areas. The background visual range was estimated to be about 37 miles (60 km), 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 demonstrated an average of 67 miles for the period September 1970 to March 1971. Average visual range calculated from particle size distribution at Bear Creek and Huntington Canyons in 1974 was approximately 45 miles.

Analysis of photographs taken at Clawson, Utah 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 have shown averages between 94 miles in November-December 1976 and 54 miles in April 1977 (Peuschel et al. 1978).

5. VEGETATION

Most of the area overlying the project is covered with the Conifer-Aspen type on the north-facing slopes and the Aspen type on the south-facing slopes (fig. 11). The portal sites are similarly covered by the same types along with a narrow strip of Streamside type. The south-facing slope along the access road and proposed conveyor route is largely covered with the Sagebrush-Grass type. The vegetative types are described in more detail, including a species list, in part 1, chapter II. The Conifer-Aspen type includes Douglas fir, Englemann spruce, alpine fir, aspen, current and very little understory vegetation. The Aspen type produces aspen with a heavy understory including big sagebrush, dandelion, needlegrass, geranium, snowberry, and mountain bluebells. The Streamside type contains elderberry, willow, dandelion, wheatgrass, yarrow, and meadow rue. The Sagebrush-Grass type includes big sagebrush, big rabbitbrush, serviceberry, bitterbrush, aster, milkvetch, wheatgrasses, and needle-and-thread grasses. No threatened or endangered plants have been identified in the project area (Welsh, 1977).

6. WILDLIFE AND FISHERIES

The area of the proposed minesite contains a wide diversity of wildlife including mammals, birds, amphibians, and reptiles. Game species in the area include: deer, elk, moose, mountain lion, bear, snowshoe hare, blue grouse, ruffed grouse, and mourning dove. Sage grouse are found in the area north and east of the town of Scofield (fig. 1). A strutting ground is located approximately 2 miles north of Scofield Reservoir, adjacent to the west side of highway U-96. Beaver, mink, and muskrat are furbearers found in the area, and river otter have been trapped illegally from the Fish and Pontown Creek drainages west of Scofield Reservoir (fig. 1). The American peregrine falcon is an occasional visitor, but no other threatened or endangered wildlife species are known to occur in the area.

The proposed minesites (fig. 2) are in an area of mule deer summer range on deer herd unit 32 (part 1, fig. II-18). Winter range for this population is not clearly defined but some deer may move northeast to the Soldier Summit vicinity while others may migrate east to the Gordon Creek winter range (fig. 1). The deer population on this unit is below the carrying capacity of the range and productivity is slightly below the State average. The amount of productive winter range is the limiting factor for deer in this area. Most of the lands on this deer herd unit are private property, and are posted "no hunting". During the period 1970-1976, the average deer highway mortality on the unit was 25.8 deer per year. Most of this highway kill was on US 6 between Helper and Soldier Summit (fig. 1).

The area is in calving habitat and summer range for elk and moose. Elk winter on range to the southeast, and moose winter in areas of riparian habitat in several nearby drainages (Scott and others, 1977).

Mountain lion range throughout the area (fig. 1); their movement is related to deer migrations. In the 1975-76 season, hunters

Figure 11.--Northern view of McKinnon No. 2 mine portal area. The portals would be in the aspen grove in the upper left part of the picture.

spent 79 days in pursuit of mountain lion in deer herd unit 32, and harvested four lions.

The drainages in the area provide habitat for an extensive beaver population. The trapping unit which includes this area ranks as one of the better beaver trapping areas in the state. During the 1975-76 season, licensed trappers harvested 51 beaver on the unit, and Utah Division of Wildlife Resource trappers took 26 beaver on the unit, and Utah Division of Wildlife Resource trappers took 26 beaver in response to nuisance complaints by landowners.

Gamefish found in Pleasant Valley (Mud) creek and tributaries, Eccles Canyon and Boardinghouse Canyon Creeks are predominately cutthroat trout with rainbow trout found in the lower reach of Pleasant Valley Creek (fig. 1).

Pleasant Valley Creek is a tributary to Scofield Reservoir on the Price River, Scofield Reservoir is one of the few "blue ribbon" waters in the State of Utah lying approximately 8 miles from the center of the proposed mine area (fig. 1). It is a highly productive reservoir populated with cutthroat and rainbow trout. The cutthroats are maintained by natural reproduction in the tributary streams whereas rainbow fingerlings are planted annually.

Pleasant Valley Creek is divided into two fish management sections with the 7.5 mile section 1 immediately above Scofield Reservoir to Finn Canyon and a 2.8 mile section 2 from Finn Canyon to the headwaters. It has substantial fishery values in section 1 and is rated a class 3 stream by the Utah Division of Wildlife Resources. This section is populated by cutthroat and rainbow trout, however the population and reproduction is considered poor. Watershed is good and stream quality is fair. Section 1 of Pleasant Valley Creek has significant erosion and silt during high runoff and has a high population of minnows and suckers (fig. 1).

Section 2 of Pleasant Valley Creek doesn't have a fishery value. Previous mining altered the stream and it has never been reclaimed. It could probably provide a fair fishery if it were reclaimed.

Pleasant Valley Creek has three tributaries entering it which originate in the vicinity of the proposed action that are: Winter Quarters, Green Canyon and Eccles Canyon (fig. 1). Winter Quarters is a small but high priority 5-mile stream. It has a good population of cutthroat trout and reproduction is considered good. Watershed and stream quality is good and the stream rates as a class 3 fishery.

Eccles Canyon Creek is a high priority 3.6 mile tributary. It has a good population of cutthroat trout and reproduction is good. Watershed and stream quality is good. It is a class 3 stream.

Green Canyon, with its steep gradient and natural fish barriers, does not have a gamefish population but is important in contributing water to Pleasant Valley Creek and Scofield Reservoir.

Gamefish habitats in the Huntington Creek can be logically divided into three ecosystems: (1) Huntington Creek from Electric Lake Downstream to the Main Division, (2) Electric Lake, and (3) Huntington Creek from Electric Lake upstream to its headwaters (fig. 1).

Huntington Creek below Electric Lake has 21 miles of gamefish waters in three fish management sections. Various combinations of brown, cutthroat and rainbow trout are found mixed throughout this part of the stream.

Electric Lake is a 476 surface acre reservoir on Huntington Creek that is populated with cutthroat trout. The cutthroats are primarily maintained by natural reproduction from upstream Huntington Creek, however supplemental plants of hatchery cutthroats are made annually.

In the 3 mile headwater section of Huntington Creek cutthroats are the only gamefish and it is managed as a spawning and nursery area for Electric Lake cutthroats. It is permanently closed to fishing.

B. CULTURAL ENVIRONMENT AND LAND USE

1. LAND USE CONSTRAINTS AND CONTROLS

Carbon County zoning ordinance, as amended February 15, 1977 with a revised zone map dated 1974, places proposed Routt County Development LTD McKinnon No. 1 and No. 2 mines within a mining and grazing zone...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 and mine waste dumps and underground mines and 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."

The coal leases are on lands administered by the National Forest Service and are subject to land use plans included in the Ferron-Price Land Use Plan which is scheduled for completion October 1978. The preliminary draft of the Ferron-Price Land Use Plan, April 1978, gives no indication of stipulations or conflicts which would preclude the proposed coal development.

The area to be mined and surface operations do not occur in a roadless area. The National Forest Service RARE II study does, however, identify several roadless areas in the general vicinity of the mining operation (part 1, fig. II-23). Evaluation of the RARE II areas to determine wilderness suitability will be completed in December 1978. In the interim, the roadless areas and their undeveloped status would be protected and maintained pending further study.

2. AGRICULTURE, RANGE, AND TIMBER

There are no agricultural lands within the project area.

Sheep from three National Forest Allotments graze the portal and lease area as follows:

Allotment	Numbers	Season	AUM's
Burn Out	628	7/1-9/30	384
Eccles Canyon	1,000	7/1-9/30	500
Winter Quarters	996	7/1-9/30	598
Total	2,624		1,482

Private lands below the National Forest boundary are grazed by similar numbers of sheep both before and after the 7/1-9/30 dates.

Forest uses include cutting fenceposts and firewood. Although both private and National Forest lands sustain small to moderate volumes of sawtimber, little use is made of the sawtimber. The Forest Service has proposed a 500,000 board foot sale for the head of Eccles Canyon in the near future. This sale would salvage insect-killed spruce in that area. It would overlie some of the proposed mine area and require access roads to remove the timber.

3. SOCIOECONOMICS

This somewhat isolated area, accessible by a two-lane State road, is located deep within a mountain range (fig. 1). It is rural, scenic, and its socioeconomic history and present condition are related to three factors. First, miners once worked in this area and lived in Scofield, Clear Creek, and Winter Quarters (fig. 1, 10). It is estimated that the 1900-1930 population was about 2,500-3,000. The mines have been closed for several years and the miners and most of the associated populations have gone. Total population now is about 100 people. These communities have become unkempt and composed essentially of small wood-framed and mobile homes. Second, this area is close to Scofield Reservoir and has become a popular summer home and fishing area. Around the reservoir, several small mobile and temporary wooden home enclaves have developed over the last 10 to 20 years. In each enclave there is at least one concessionaire. Third, a small number of ranches are in this markedly pastoral area. Residents have to travel 40 to 80 miles to either Price (fig. 1) or Provo (about 65 miles west), Utah for sundry goods.

4. TRANSPORTATION AND UTILITIES

Utah Highway 96 (U-96) passes the mouth of Eccles Canyon on its way from Clear Creek through Scofield to a junction with US Highway

6 near Soldier Summit (fig. 1). In 1975, between Clear Creek and Scofield, U-96 carried about 310 vehicles per day, of which only five were trucks having six wheels or more. Mining activity has picked up since that time, but later traffic counts are not available.

McKinnon No. 1 mine lies 2.6 miles up Eccles Canyon on county road and Forest Development Road road 50227 (fig. 1). About 1.2 miles of the road have been improved (14 acre right-of-way) to carry coal truck and commuter traffic from the Belina No.'s 1 and 2 mines (fig. 7); it is graveled, graded, maintained, and of a width to permit easy passage of the trucks. The remaining 1.4 miles of road have been graded and receives some maintenance, but would have to be further improved to carry coal truck traffic, including further widening in spots, as far as the McKinnon No. 1 proposed portals (fig. 7). About 1,250 feet of the upper section of road is Forest Development Road 50227 on National Forest land.

The McKinnon No. 2 mine portal would lie about 0.6 miles south of Eccles Canyon in South Fork Eccles Canyon (fig. 7), via a Class 3 (cut but not improved) Forest Service road one lane wide, steep but passable in dry weather. Power and telephone services are available as close as the Belina No. 1 mine, about 1 1/2 miles away, but are inadequate to service the McKinnon mines. A natural gasline passes the mouth of Eccles Canyon (fig. 9).

A spur of the Denver and Rio Grande Western railroad passes the mouth of Eccles Canyon on its way from Scofield to Clear Creek, but is unfit for traffic south of the Utah No. 2 mine (fig. 8), about a mile north of the mouth of Eccles Canyon. The spur connects with the Denver and Rio Grande Western main line at Colton siding (fig. 1).

5. RECREATION

Access in the Main Fork of Eccles Canyon is via county road and Forest Development Road No. 50227. This road provides the only direct connecting access route between the Scofield Reservoir recreation area and recreation facilities and use areas at higher elevations on the North end of the Wasatch Plateau (fig. 1). About 50 vehicles per day in summer and fall travel the single lane, graded dirt section of this road within the boundary of the Manti-LaSal National Forest (fig. 3). It is closed to thru traffic by heavy snows at higher elevations about seven months each year. An estimated 30-40 recreation vehicles per day travel this road when it is open (Manti-La Sal National Forest Traffic Court records, June-October, 1977). Although not designed to accomodate large recreation vehicles (mobile homes, etc.) or vehicles with recreation equipment in tow, some of the recreation traffic involves such vehicles and equipment.

The South Fork of Eccles Canyon is served by a single lane four-wheel drive road which parallels the canyon bottom (fig. 7). This side canyon, except for the primitive road and excavation work at the proposed portals show little effect of man's activities. At the present time, the South Fork receives little recreation use, except for hunting big game during September, October, and November.

Recreation use within and immediately adjacent to the coal lease area consists primarily of (a) driving for pleasure and to gain access to recreation use areas at Scofield Reservoir or to higher elevations on the North end of the Wasatch Plateau (fig. 1); (b) viewing the forest environment; (c) hunting big game, game birds, small game and non-game species; and (d) snowmobiling. Some camping, picnicking and stream fishing also takes place off the lease area on private lands in the mouth of Eccles Canyon.

The Scofield Recreation area (fig. 1) is visited by more than 100,000 recreationists annually, for fishing, boating, camping, picnicking, summer home use, horseback riding, snowmobiling, and hunting of game and non-game species. Utah State and Carbon County boat launching facilities were visited by more than 42,000 people in 1976. Totally, more than 50,000 recreation visitor days were spent within and adjacent to the Scofield recreation area. Although total recreation visitor days are not kept for the Scofield area, more than 22,000 visitor days are spent fishing at Scofield Reservoir on an average year (Utah Div. of Parks and Recreation, 1976; oral commun., Utah Div. of Wildlife Resources Conservation Officers, 1977).

In 1976, more than 190,000 recreation visitor days were spent at higher elevations on the north end of the Wasatch Plateau. Recreation uses and activities are similar to those at Scofield, but the area is more heavily used for camping, picnicking, sightseeing and fishing (Manti-La Sal N.F., 1976). Fishing use on lakes and streams, for instance, amounted to 37,300 visitor days on top of the North end of the Plateau in 1976.

Occupancy and use of developed public facilities, such as boat ramps, campgrounds and picnic sites in both areas, except for holidays and three-day weekends, is generally below designed user carrying capacities.

However, all such sites in both areas are approaching use and occupancy rates which are diminishing the outdoor recreation experience level expected by users. It is also becoming more difficult to maintain developed facilities in good condition and to keep littering and vandalism at or below existing levels.

The combination of private developments and public recreation facilities, in combination with the heavy recreation use at Scofield Reservoir is, or has the potential of, creating severe pollution problems of both lands and waters in the area. No developed sewer systems or landfill sanitation facilities exist in the area, and effects from polluting sources are becoming more evident and acute each year.

6. ARCHEOLOGIC AND HISTORIC VALUES

In 1977 transects at the undisturbed mine plant and ancillary facility locations showed the area to be heavily vegetated, with few or no natural shelves suitable for prehistoric or historic occupancy sites, and void of cultural sites, and materials (Wikle, 1977). Most of the area at the mine plant location is disturbed by previous mining activity. Previous archeological work preceding development of 38 drill pads, mine expansion projects, and access roads showed no cultural material, except for one isolated projectile point fragment (Archeological Environmental Research Corp., 1975a, 1975b, 1975c, 1976; Walker, 1977). This area probably received only occasional use.

The National Register of Historic Places lists no cultural sites for the area.

7. ESTHETICS

The esthetic resource of Main and South Fork of Eccles Canyon is primarily of an alpine forest landscape. The lower part of the Main Fork of Eccles is classified as having moderate scenic quality with a medium or low sensitivity to viewing and to modification because of existing intrusions within the natural landscape character (Torgeson and Carpenter, 1977) (fig. 1).

The Main and South Fork of Eccles, above the Belina mine turnoff (fig. 7), is classified as having high to excellent scenic quality and a high level of sensitivity for viewing and to modification.

Present modifications and intrusions within the natural landscape of the lower part of Main Eccles Canyon include; (a) the improved county road to the Belina mines (fig. 7); (b) natural gas lines, gas and water wells (fig. 9); (c) powerlines; and (d) several low standard road to undeveloped campsites. Modifications of the natural forested landscape above the turnoff to the Belina mines create less visual impact because they are fewer in numbers and less prominent in scale. Modifications and intrusions in this area include: (a) the low standard (single lane with turnouts) section of Forest Development Road 50227; (b) some remnants of the old Eccles Canyon mine at the Forest Boundary (fig. 30; (c) tractor excavation cuts at the proposed portal entries to the No. 1 and 2 mines; (d) a primitive, low standard road in the South Fork of Eccles Canyon (fig. 7).

Visual resource management objectives for both forks on National Forest lands are: (a) retention of the Natural Forest landscape character in foreground and highly visible areas in the middleground viewing zones; (b) partial retention in the middleground and background visual zones; and (c) rehabilitate the old Eccles Canyon minesite. Visual resource management objectives on adjacent private lands are not defined.

C. FUTURE ENVIRONMENT

Little change would occur in the area without mining. Forest lands would continue to be used by livestock and wildlife and for minimal timber production. Forest development road No. 50227 may be improved to enhance recreation traffic between Scofield and Electric Lakes and to provide access for mine workers from Juab County.

CHAPTER III: ENVIRONMENTAL IMPACTS

A. NATURAL ENVIRONMENT

1. LAND

a. Land Surface

About 69 acres of surface contour would be leveled, filled, or cut to construct roads, conveyors, and portal facilities necessary to the project. Mine No. 2 would disturb about 26 acres in the South Fork of Eccles Canyon and the remaining disturbed acreage would be in addition to acreage already disturbed in Eccles Canyon. These cut and fill operations in narrow canyons with steep, soil-covered slopes (45 acres on National Forest, 24 acres on private surface) would alter land forms and surface areas to conform to mining needs and interrupt natural surface drainage patterns.

Land surface subsidence is expected above about 6,250 acres of mined-out area; "A" split coal has been eroded on about 40 acres in Eccles and South Fork of Eccles Canyons. Small landslides are common where coal is mined beneath steep canyons and subsidence could reactivate dormant leasehold landslide areas. General and regional land surface impacts common to mining are further described in part 1, chapter IV.

b. Geology

The company identifies reserves of 86 million tons in the Upper O'Connor (McKinnon No. 1 mine) and 177 million tons in the Lower O'Connor (McKinnon No. 2 mine). They predict recovery rates of 60 to 70 percent for room-and-pillar mining and 88 percent for longwall sections with an annual production of 2.5 million tons from the Upper O'Connor (22.5 million tons the first ten years) and .94 million tons from Lower O'Connor (2.3 million tons the first 5 years). At a recovery rate of 50 percent, current experience in Utah underground coal mines, about 131 million tons of coal would be taken from the two beds in the Blackhawk Formation. Energy resources would be impacted by removing the 131 million tons and by leaving about half of the available coal in place as support pillars and fire walls or in beds that exceed mine equipment capabilities. The future recovery of the remaining coal is not considered feasible by present technology.

Coal recovery would be slightly impacted should any well drill sites be staked on the leasehold prior to mining. Each drill site would be protected by leaving a 300 foot by 300 foot pillar of coal. Should mining precede drilling, oil and gas recovery would be slightly impacted by higher drilling costs. Wells sited above mine workings or subsided overburden would have to be cased through the disrupted zone.

Impacts to paleontological resources would consist of losses of plant, invertebrate, and vertebrate fossil materials for scientific research, public education (interpretative programs), and to other values. Losses would result from destruction, disturbance or removal of fossil materials as a result of coal mining activities, and unauthorized collection, and vandalism as a result of increased regional population. The extent of impact cannot be assessed because of lack of data.

Because of the present 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. Soils

Soils would be disturbed on about 69 acres within the Canyon and Ridgelands Landtype. Table 1 shows a breakdown of acreage disturbed for various purposes.

Soil disturbance would be severe over most of the project area owing to the amount of cutting and filling necessary on the steep slopes. Onsite erosion rates would increase up to 20 cubic yards per acre per year on exposed soils. Erosion control practices would reduce erosion rates significantly, but there would still be a potential hazard for sediment delivery to Eccles Creek and the South Fork of Eccles Creek by surface erosion as well as potential mass movement (fig. 3). The 100-foot wide firebreaks around the portals pose a significant erosion hazard since these sites must be maintained bare of vegetation. The mining plans do not discuss what erosion control measures would be used on the firebreaks; however, the techniques used would have to meet Federal and State standards to protect water quality.

Reclamation would be quite difficult and costly, due primarily to the steepness of the slopes. With reclamation techniques designed for steep slope situations the soil productivity on the reclaimed sites would not be significantly reduced (no more than 10 percent) from what it was prior to mining. A temporary loss of soil productivity would occur from the time the soil was first disturbed until it has been reclaimed.

2. WATER

Subsidence and subsequent fracturing of the material overlying the mine could cause some of the surface runoff to be diverted into the ground, but the quantity of water that might be diverted, if any, cannot be predicted. Surface runoff diverted into the ground would not be lost because it would return as ground-water flow to streams somewhere down gradient.

Subsidence and associated fracturing would disrupt ground-water flow patterns to some extent; recharge would likely increase, some perched water zones might be drained, water may be diverted from existing springs to other points of discharge. Mine drainage also may alter the ground-water flow system and result in water being diverted from Pleasant Valley to Huntington Drainage, or vice versa. Ground-water seepage to the mine may tend to flow westward along the floor of the mine as well as downward through fractures beneath the coal. Hence, some of the 95-acre-feet per year of Pleasant Valley seepage may drain to Huntington Creek. If the seepage rate is great enough, perhaps the water would be pumped out the portal and remain in Pleasant Valley. As mining progresses under the Huntington Creek watershed, however, dewatering through the portal may result in diverting water from Huntington Creek to Pleasant Valley (fig. 1). The quantity of water involved might exceed the normal recharge of 245 acre-feet per year owing to increased recharge resulting from subsidence and subsequent fracturing, but likely would be less than 1 percent of the annual flow of Huntington Creek (70,000 acre-feet).

a. Water Use

Water requirements for the proposed action would be as much as 1,400 acre-feet per year, 150-200 acre-feet for mining purposes and 1,250 acre-feet for additional domestic supplies needed for the increased population in the nearby communities. Sewage effluent would increase by 700 acre-feet per year. Total consumptive use would be 700 acre-feet per year or less than 1 percent of the water normally available; however, if water is supplied from drilled wells, the drawdown of the water table could deplete ground-water flow to Eccles and Pleasant Valley Creeks (fig. 1).

b. Water Quality

The chemical quality of both surface- and ground-water in the area might be deteriorated somewhat as a result of the proposed coal mining. Subsidence and subsequent fracturing of the overburden would tend to cause more ground-water movement and increase the potential for leaching of chemical constituents from the rocks, which might lead to increased concentrations of dissolved solids (perhaps as much as 10 percent in local surface- and ground-waters. However, changes in water quality in Scofield Reservoir, the Price River below Scofield, and Huntington Creek probably would be negligible (fig. 1).

Concentrations of suspended sediment may increase severalfold locally in Eccles Creek, particularly if high-intensity rainfall occurs during construction, when potential erosion rates are greatest. However, this increase would be relatively insignificant in terms of sediment movement in Pleasant Valley Creek because the potential sediment source areas are only about one-half of 1 percent of the watershed.

The proposed tailings pond of McKinnon No. 2 is located on the Connelville fault (fig. 3). Movements along the fault could easily rupture the pond and contaminate the underlying perched ground water.

The proposed coal conveyor belt parallel to the creek, poses a threat of coal dust settling in the creek bed and contaminating the stream and water table.

3. AIR

The main sources of total suspended particulates (TSP) would be dust from bus and service vehicle travel on unpaved roads and coal particles at coal handling sites. Most coal particles would settle out within short distances (one mile or less) downwind. Should the Eccles Canyon road not be paved, heavy traffic at shift changes would cause high levels of TSP. It is estimated that incremental increases in TSP could be as high as 130 $\mu g/m^3$. Adding the 130 $\mu g/m^3$ to other sources of TSP along the Eccles Canyon road, which include dust from the Belina Nos. 1 and 2 mine traffic and the natural background, it is estimated that maximum 24-hour TSP concentrations could be as high as 300 $\mu g/m^3$. The Federal secondary NAAQS standard, which does not necessarily apply here, is 150 $\mu g/m^3$.

Total annual potential emissions from the mine (coal storage, conveying and transfer and fugitive dust from bus and service vehicle travel on the unpaved Eccles Canyon road would be an estimated 730 tons (160 tons from mining activities and 570 tons from traffic on the unpaved Eccles Canyon road). Sources with the potential to emit 250 tons or more of pollutants per year are subject to PSD permit review by EPA.

Dust associated with bus and service vehicle travel to and from the mines in Eccles Canyon would significantly impair visibility in the immediate vicinity of the road unless it was paved. The impact would be short term in duration, being confined mainly to periods of heavy traffic.

4. VEGETATION

The most serious impacts from destruction of vegetation would be caused by the portal facilities, access roads, powerlines, and coal conveyor. Approximately 69 acres of vegetation would be destroyed in the Conifer-Aspen, Aspen, Sagebrush-Grass, and Streamside types. An additional 14 acres have already been impacted by the county road in Eccles Canyon. No impact is foreseen on the vegetation overlying the mines during the life of the proposed project and no threatened or endangered plants would be impacted by the proposal.

5. WILDLIFE AND FISHERIES

Wildlife habitat deterioration caused by mine construction and operation of the proposed mine would reduce expected wildlife use.

Deer use would be reduced on 436 acres of range. Fifty acres of habitat would be actually destroyed in the construction of the facilities at the mine portals. No deer use would be expected in this area. An area extending a tenth of a mile from the perimeter of the mine facilities would be expected to experience a 50 percent reduction in normal deer use. A quarter mile-wide strip, including the roadway and conveyor belt along 3.2 miles of creek bottom between the mine portals and the railroad loadout (fig. 7), affecting 256 acres, would be used less by deer. The barrier effect of the conveyor route would disrupt deer movement it may intercept.

Historical deer fawning areas in the vicinity of the proposed mine development would probably be abandoned if the action is taken because of the increased disturbance. Individual deer require seclusion from disturbance and other deer during and for several days after fawning.

Elk would be expected to avoid using an area within half a mile of each mine portal (fig. 3) and an additional area of at least 1,800 feet wide along the 2.2 miles of conveyor-roadway route (fig. 7) beyond the influence of the mine portals. Overall reduced elk use on 1,480 acres of range would be expected, based on a comparison of studies made by Ward (Ward, 1973). The barrier effect of the conveyor would disrupt elk movement it may intercept.

Historical elk calving grounds in the vicinity of proposed mine development would probably be abandoned if the action is taken because of the increased disturbance. Cow elk are extremely sensitive to disturbance and other elk around calving time, and require seclusion during this time.

The proposed McKinnon No. 1 mine portal and the conveyor and routes in Eccles Canyon would be built entirely in critical moose winter range. Habitat destruction, the barrier effect of the conveyor, and the vehicle strike hazard to moose would effectively cause the loss of this entire unit of critical moose winter range. The barrier effect of the conveyor route would be expected to disrupt any moose movement it would intercept. Critical moose winter range includes approximately 3 miles of Eccles Canyon (fig. 7).

Increased traffic caused by developing the proposed mines would increase the vehicle-strike hazard to wildlife. Particularly vulnerable would be deer, moose, sage grouse, cottontails, and small non-game mammals. Deer highway mortality along US 6 between Helper and Soldier Summit (fig. 1) would be expected to increase from 25.8 per year. Moose may be struck by vehicles at any time of the year; however, vehicle-moose collisions would be expected to he higher in the winter, in and close to moose winter range. Sage grouse highway mortality would be expected to increase, especially in the vicinity of the strutting (breeding) ground adjacent to highway U-96 north of Scofield Reservoir (fig. 1).

New powerlines constructed to service the project area would be a strike hazard to all birds. Lines constructed 100 yards or less from roads would increase the risk of perching raptors being illegally shot.

New roads, culverts, and bridges encroaching on beaver habitat would be expected to bring an increase of nuisance beaver complaints to the Utah Division of Wildlife resources because of damming and flooding. To alleviate the problem, the beaver population would have to be reduced in the Scofield Reservoir drainage (fig. 1).

Changing surface- and ground-water flows because of mining and its resultant subsidence, mine dewatering, mine use and increased domestic use caused by taking the proposed action would affect fish habitat. Water naturally destined for Huntington Creek before mining would probably be pumped out of the mine into Eccles Canyon and Pleasant Valley Creeks increasing their flow during mining at the expense of Huntington Creek above Electric Lake (fig. 1). Any reduction of water in this cutthroat nursery area would seriously affect natural cutthroat reproduction for Electric Lake. After mine pumping is stopped, the water naturally destined for Eccles Canyon and Pleasant Valley Creek before mining would be diverted to Huntington Creek, improving its flow.

Changing water flows during and after mining may affect the distribution of the terrestrial animals as well. Increased flows in Pleasant Valley Creek below Eccles from pumped mine water may improve beaver, mink, and muskrat habitat during the mining period; however, this improvement would be lost following mining and Eccles Canyon would remain a more xeric habitat type than it is now. After mining, the increased flows in Huntington Creek above Electric Lake would improve beaver, mink, and muskrat habitats in that stream.

The projected in-migration of 6,150 to 6,300 people would require housing space and water, probably be to the detriment of come from and fish habitat.

There would be an increased demand for game and fish resources in the vicinity caused by theincreased number of people. Their encroachment upon wildlife habitat while seeking outdoor recreation would increase harassment to wildlife. An increase in illegal killing and taking of all protected fish and wildlife would be expected.

B. CULTURAL ENVIRONMENT AND LAND USE

1. RANGE AND TIMBER

The vegetation destroyed by the project would reduce the grazing capacity by approximately 14 AUM's per year for the life of the mine. The access roads, conveyor, and portal facilities would disrupt normal grazing patterns to a moderate degree. Watering places may be changed or lost through subsidence.

A small volume of fenceposts and firewood would also be destroyed by the project. The 120 mbf of sawtimber growing on the area would be harvested to Forest Service requirements. Access for harvesting forest products would be enhanced by the improved roads, but conflicts between logging trucks and mine and recreation traffic may occur. Insect populations could build up in the slash caused by the clearing operation.

2. SOCIOECONOMICS

About 30 percent of the new population would reside in the Scofield area and the remainder would live in the Price City region (fig. 1). McKinnon mines would account for about 10 percent of the population increase of the projected production level (part 1). Scofield area public services would require modernization. Urbanization associated with mine development would demand construction of additional permanent or mobile housing, increased school rooms, and a need for additional school personnel, law enforcement officers, and other public service employees. Major Price City impacts would be the provision of adequate temporary or permanent housing. Other impacts would be the community and county costs which would require taxation and bonding of local, county, or state residents to construct, operate, and maintain sewer, water, street, garbage collection, police, fire, and public health services.

It is estimated that monthly salaries for mine employees would be $800-$1,500. These higher incomes, the increased tax base, and the increased total regional personal income would produce a more expanded business economy in both the Scofield and Price City areas. The effect of these new payrolls is discussed in part 1, chapter IV.

3. TRANSPORTATION AND UTILITIES

Environmental impacts would result from the construction, presence, and (or) operation of roads, a coal conveyor system, and utility lines. Impacts would be minimized should the roads, conveyors, and utilities share the same right-of-way.

The overall road grade from U-96 to the McKinnon No. 1 mine is about 5.1 percent (fig. 7), mostly north slope sidehill cut. About 100 feet of right-of-way would be needed west of Whisky Gulch for an adequate roadway to pass coal and supply trucks, the coal conveyor, and utilities. The road grade is about 7 percent from Eccles Canyon to the proposed McKinnon No. 2 mine portal (fig. 7). About 150 feet of right-of-way would be needed for a 22-foot traveled way, coal conveyor system, and utilities.

Although the Eccles Canyon right-of-way alinement has not been determined, the company prefers access along the north slope. They propose joint use of the existing Valley Camp of Utah right-of-way east of Whisky Gulch to U-96 and to upgrade Forest Road No. 50227 west of Whisky Gulch, the present access to the Belina mine, to the McKinnon No. 1 mine (fig. 7). The conveyor, proposed to be built along the Belina No. 1 access road (county road) and the upgraded Forest Road, would occupy about 12 to 15 feet of the right-of-way and probably could be maintained from the access road or from an unimproved road to several spring houses. Should the north slope conveyor access not be available to Routt County, Ltd., they propose to acquire a conveyor right-of-way on the south slope. A 50 foot right-of-way would be needed for the conveyor and maintenance road in the steep terrain, but only 25 feet of it would be permanently occupied.

In order to reconstruct about a mile of railroad spur from the Utah No. 2 mine to the proposed McKinnon mines loadout (figs. 7, 8), extensive rebuilding must be undertaken, with consequent effect on Pleasant Valley Creek, which passes very close to and in some places under the disused railroad. Construction of an electrical substation would take place in the mouth of Eccles Canyon (fig. 8), as would construction of a coal loadout facility and parking for the vehicles of the miners, who would ride busses to the portals (fig. 7).

It is assumed that about 30 percent of the miners would live in the Scofield area and the rest would commute from the Price-Helper area with an average commuting distance of 27.5 miles one way. Commuters and mine service traffic would add about 1,156 vehicle passages per day between Eccles Canyon and Scofield and about 850 vehicle passages per day between Scofield and Helper. Traffic of this magnitude would increase the traffic on U-96 south of Scofield from 310 vehicles per day (vpd) to 1,325 vpd, about 4 times as much, would increase the traffic on U-96 north of Scofield from 345 vpd to about 1,195 vpd, about 3 times as much, and would increase the traffic on US-6 between U-96 and Helper from 3,365 vpd to about 4,215 vpd, an increase of about 25 percent based on 1975 traffic data (fig. 1). Increases in traffic of this magnitude from the McKinnon mines alone would result in a volume of traffic on U-96 within the capacity of the road, although there would be inconvenience and some conflict with recreation-vehicle traffic in the vicinity of Scofield Reservoir. US-6 has received some upgrading already, and it is estimated that it can carry this additional traffic without material effort. However, the total amount of traffic to be anticipated from all mining in the Scofield-Pleasant Valley area will change this picture somewhat.

Conflicts between mining and recreation traffic are expected in summer and fall on the county road and Forest Road 50227 in Eccles Canyon (fig. 1). Alternative routes for recreation traffic are proposed in part 1.

Beneficial impacts, particularly increased vehicle safety and decreased dust, would result from paving the roads up Eccles Canyon and the South Fork Eccles Canyon. Traffic within the Eccles Canyon complex would be materially reduced through hauling coal by conveyor and by transporting the miners from the mouth of the canyon to the mines by bus.

4. RECREATION AND ESTHETICS

The proposed action would eliminate the near-natural condition and reduce the remote, unoccupied appeal of the South Fork of Eccles (fig. 7). Although seldom utilized, dispersed or back country recreation would be degraded.

Mining developments, support facilities, and surface activities in Eccles Canyon would involve occupancy and use of lands in and adjacent to the canyon bottom. In addition, the proposed mine plantsite and mine portal entries would take up lands present occupied by, or immediately adjacent to Forest Development Road 50227. This would require realinement of the road in the canyon. Increased traffic from accelerated mining activities and normal annual increases in recreation travel in the canyon could create severe congestion and safety problems for all users of Forest Development Road 50227. Noise, dust, littering and vandalism would be expected to increase, resulting in a reduction or lowering of the recreation experience level for recreationists using the canyon. Increased traffic volumes on U-96 (fig. 1) would create similar impacts.

Use of the Scofield Reservoir and higher elevation areas on the North end of the Wasatch Plateau would also increase as a result of increased populations needed to support the proposed action (fig. 1). This could result in continued over-use and deterioration of developed recreation facilities in both areas and some degradation of roadless areas. Increased use would also increase land and water pollution problems in the Scofield area.

Increased pressures from hunting and fishing activities could also result in a lowering of hunting and fishing success and enjoyment.

The proposed action would also impose significant industrial modifications and intrusions on the natural forested landscape character within both forks of Eccles Canyon. Slopes in the South Fork are steep sided and the canyon bottom is narrow. The extensive cuts and fills on slopes would result in extensive visual modification.

Developments and activities in Eccles Canyon would introduce significant and dominating industrial modifications within the natural forest landscape (fig. 7). These modifications would be located in foreground and middleground viewing zones from Forest Road 50227 and would be in conflict with visual management objectives for Eccles and South Fork of Eccles Canyons.

5. ARCHEOLOGIC AND HISTORIC VALUES

No sites were found during recent cultural resource surveys; however, sites may be found during 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 due to mining may result in more vandalism of cultural resources in the region. Surveys will add to the cultural resource knowledge of the region.

CHAPTER IV: MITIGATING MEASURES

State and Federal laws, regulations, and administrative policies that require mitigation or reclamation of mine areas, and requirements of the surface management agencies and the USGS District Mining Supervisor are discussed in detail in part 1. These mitigating measures shall be required at this minesite and are detailed in sections C and D of chapter I. Other mitigations are detailed in chapter VIII.

CHAPTER V: ADVERSE EFFECTS THAT CANNOT BE AVOIDED

Adverse effects cannot be avoided on about 69 acres disturbed by construction and occupied by the portal facilities, storage area, access roads, and conveyors. Increased erosion would occur over the disturbed surfaces when the soils are exposed and until the sites are revegetated or runoff is controlled by other means. Erosion of soils on the steep sideslopes could be expected to result in an increase of up to 20 cubic yards of sediment per acre per year during the period of soil exposure (usually less than 1 year) compared to the naturally vegetated condition in the area where erosion rates are estimated at less than 0.5 cubic yards per acre per year. Fenceposts and firewood would be lost by clearing the construction sites and 14 AUM's of grazing capacity per year would be lost should the acreage not be revegetated prior to the end of the project. Mine related activities in Eccles and South Fork of Eccles Canyons plus increased traffic and population in the nearby communities would reduce fish and wildlife habitat and increase the incidence of vehicle-wildlife, bird-powerline strikes (fig. 1).

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.

Subsidence is expected to occur above mined out areas across the 6,290-acre mining unit and about 131 million tons of nonrenewable coal resources would be left for support or in areas where coal bed thicknesses exceed mining capabilities. Perched water zones would be ruptured, infiltration increased, and springs could disappear or appear elsewhere causing disruptions in normal livestock grazing and watering patterns and loss of fish habitat. Increased infiltration could cause the concentration of solids in the local surface and ground water to increase by as much as 10 percent.

Water required for the proposed action would be about 1,400 acre-feet per year, 150-200 for the mining and related activities, and 1,250 for the increased population. That pumped from wells would draw down the water table in the area and stream flow could decline or be induced into the ground to feed the pumping wells.

If the Eccles Canyon road is paved, the estimated maximum 24-hour incremental increase in TSP due to the McKinnon Nos. 1 and 2 and Belina No. 2 mine traffic could be approximately 60 $\mu g/m^3$, which is significantly below the secondary NAAQS of 150 $\mu g/m^3$. Increases due to the McKinnon mines alone could be approximately 40 $\mu g/m^3$.

Present rural lifestyles characteristic of the subregion would be changed to a more cosmopolitan type lifestyle. The construction of mine related facilities would result in increased noise, dust, and traffic interruptions in Eccles Canyon. Road maintenance requirements would increase along with inconveniences because of the added traffic and traffic safety levels would decrease, especially in Eccles Canyon on Forest Road 50227 and on U-96 where conflicts and safety hazards are expected between mine and recreation traffic. The higher population levels and greater numbers of people commuting to the area would result in additional modifications and intrusions within the forest landscape, increased littering and vandalism, decreased hunter and fisherman success and satisfaction, and overuse and deterioration of some developed and underdeveloped recreation facilities and sites.

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.

CHAPTER VI: SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Adjacent lands are currently being mined for coal. Some mining has occurred within the lease area in the past; therefore, mining for 35 to 40 years would represent no change other than implying an increase in coal production from the region.

About 131 million tons of coal would be mined and consumed as a nonrenewable energy resource and a similar amount, considered unrecoverable by present day technology, would be left in the two beds. Tension fractures, buckled bedrock, shallow troughs and sinkholes, and potential landslide and rockfall areas on steep slopes would be permanent subsidence related surface deformation features. The fractures would probably be small (a few feet long, a few inches wide, and few feet deep) and probably would be filled in by soil or their own debris. Similarly, bedrock buckling would generally be less than a foot in height and trough depths would be 50 to 90 percent of mined coal thickness, depending upon overburden thickness and strength. Subsidence related surface deformation above mined-out areas is described in the Central Utah Regional EIS.

Implementation of the mine proposal would impact an undetermined number of uninventoried exposed and unexposed fossil localities, and result in an unknown gain in knowledge of paleontological resources because of exposure which might never have occurred without excavation.

Soils disturbed by the mining project on about 69 acres would be taken out of vegetative production and used primarily for mining purposes during the short term. After reclamation, the productivity would not be significantly different than it was originally, although the cost to obtain this level of reclamation would be quite high.

In the short term, vegetation, including the associated range forage and sawtimber, would be lost to the project. In the long term, after reclamation, most of these areas should be as productive as they are now, but the sawtimber would not be replaced (regrown) for many years.

Mining activities and increased human encroachment would decrease the wildlife population potential for the life of the mine, but it should recover, probably not to pre-mine levels, when mining is completed and nearby community populations decrease. The community and mine service roads left intact after mining would provide ready access to wildlife habitat and cause the populations to be continuously harassed and depressed. Short-term effects would be improved beaver, mink, and muskrat habitat in Pleasant Valley Creek because discharged mine waters would increase the flow.

Community and county tax base and resident average incomes would increase during the proposed mine's economic life. Rural economic programs and the number of residents directly employed full time in agriculture would decrease. These local communities and the subregion would become economically dependent on this proposed mine and they could become finacially depressed when the mine eventually closes or suffers any major market set back.

Short-term mining use would eliminate recreation activities in lower South Fork of Eccles Canyon (fig. 7) and the significant industrial intrusion would eliminate the canyon's near-natural forest landscape character. After mining and reclamation, the canyon would again be available for recreation use, but cuts and fills, mining residues, mine plant site remnants, and probably the access road would be evident and part of the natural landscape character would be lost on a long term basis.

Mining activities in Eccles Canyon would create immediate short-term conflicts and user safety problems on Forest Road No. 50227 and change the natural landscape character of the canyon's remaining undisturbed area west of Whisky Gulch (fig. 1). After mining and reclamation, the road would be available to recreationists and the natural forested landscape would be partially restored, but evidence of past mining activities would remain. Scenic quality of the canyon, expressed in terms of a natural environment, would be lowered from high to no more than moderate, but the increased populations and knowledge of the area would result in a continued increased use of the recreation resource of the northern Wasatch Plateau higher elevations and Scofield Reservoir (fig. 1).

Increased traffic into the area could have an adverse impact in the long run on cultural resources through collecting of artifacts by unauthorized persons. However, as the several surveys done in the general area indicate, cultural resources are of the isolated artifact type and not of sites as such. Isolated artifacts are difficult to find and are often not highly diagnostic (unless projectile points) for interpretative value. For this reason, the short- and long-term impacts upon cultural resources can be considered extremely minimal.

Any archeological sites disturbed during development of the site would result in a long-term impact to the inplace value of that site. Collection of sites that might be found will insure recording of information that could otherwise be lost to natural forces or vandalism.

CHAPTER VII: IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The 131 million tons of coal that would be recovered from the two beds within the Blackhawk Formation over the life of the project would be consumed as a nonrenewable energy resource. About the same amount of coal would be left in place as pillars, firewalls, and other roof supporting structures or in areas where coal bed thickness exceed equipment capabilities. This coal would remain as an irretrievable resource unless methods could be developed to recover it.

Impacts might occur to an undetermined number of uninventoried exposed and unexposed fossil localities.

Soil conditions would be altered on about 69 acres of land. The materials and energy used to put these soils back into a productive and hydrologically acceptable condition after mining would be an irretrievable commitment. Any soil that may be lost by erosion as a result of the project would be irretrievable.

The vegetation removed would be irretrievably lost to the project. Range forage losses would amount to 14 AUM's per year for 20 years for a total of 280 AUM's. Saw timber losses would total 120 mbf along with a small volume of fenceposts and firewood.

Water used for mining and auxilliary purposes (1,400 acre-feet per year) would be irretrievably utilized, and would not be available for other uses except for that discharged as sewage effluent (700 acre-feet per year), which could be reclaimed. The commitment of water for use by the increased population (1,250 acre-feet per year) would be irreversible should the people choose to stay in the mining community after mining is completed. Socioeconomic factors are described in the regional EIS for Central Utah.

Watershed alterations and disruption of ground-water flow patterns resulting from subsidence would be irreversible. Fish and wildlife habitat would be irreversibly lost because of the expected changes in surface and ground-water flow, water diverted to domestic use, and project related construction. The individual animals and their progeny that would have reproduced in the affected habitats would be irretrievably lost.

The termination of coal mining operations would lead to a termination of pollutant emissions. Thus the air resource would not be irreversibly committed as a result of the mine operation. Emissions from secondary growth and related activity such as traffic, urban fuel consumption, etc., induced by the proposed action would be more permanent in nature and result in a long-term commitment of the air resource to some deterioration.

Materials, labor, and energy used in the construction and operation of roads and conveyor systems would be irretrievably lost except for salvage value of the materials. Land dedicated to roads which remain part of a transportationetwork after mining is completed would also be irretrievable.

Miners commuting to the McKinnon mines would travel more than 124 million miles the first 20 years of operation (about 27,000 miles per day), consume over 5 million gallons of fuel, and wear out the equivalent of 1,240 cars. Incidental supply truck traffic would amount to nearly 5,000 miles per day or 25 million miles over 20 years. Travel and service commitment of time, energy, capital, and resources and similar unquantifiable coal transportation commitments (market not identified) would be irretrievable.

Visual resources in Eccles Canyon west of Whisky Gulch and in the South Fork of Eccles Canyon (fig. 7) would be irreversibly altered from a basically undisturbed forest landscape to one which would include some mining remnants, cuts and fills, additional roads, and powerlines. Scofield Reservoir and northern Wasatch Plateau higher elevations would be irreversibly committed to increased recreation use (fig. 1).

Any cultural resources in the immediate project area could not be preserved in place.

CHAPTER VIII: ALTERNATIVES

The general administrative options available to the Secretary of the Interior are discussed in the regional EIS, part I, chapter VIII. Detailed administrative alternatives are listed below.

A. NO ACTION

Pursuant to implied covenants of both the Federal mineral leasing laws and the existing lease agreements, the Secretary is obligated to respond to a legitimate application to conduct mining operations on a valid lease, provided that all terms and conditions thereunder have been met. His response may be approval as proposed, rejection on various legitimate grounds, approval in part and rejection in part, or approval subject to such additional conditions and requirements or modifications as he may impose under the laws. He may also defer decision, based on proper grounds, as described elsewhere in this chapter.

"No action" on proposals for continuation of approved ongoing mining operations would equate to closing down existing operations; under existing regulations, operations may not proceed in the absence of approved mining plans and related permits. The impacts of taking no actions in such cases would be approximately the same as those described under the following subsection C (2), "Cancel the leases."

"No action" on mining proposals for the initial development of existing leases would equate to maintaining the status quo on those leases. The impacts of taking no action in these cases would be the same as described subsequently under subsection C, "Prevent further development on existing leases."

Should neither of the proposed mines be developed, the environmental impacts as described in chapter III pertaining to the leasehold and proposed McKinnon facilities on private surface in Eccles and South Fork of Eccles Canyons would not occur. However, about 1.2 miles (private surface) of the Eccles Canyon road, from Highway 96 west to Whisky Gulch, has been upgraded and a conveyor system, part of Valley Camp of Utah's Belina No. 1 mine plan, is scheduled to be built along the right-of-way (fig. 7). The U.S. Geological Survey wrote an Environmental Impact Analysis on the Belina No. 1 mine in 1976 and, based on the EIA, no major Federal action was required. Oil and gas drilling activities on the Federal lands (primarily used for grazing) are expected to slightly alter the existing Eccles Canyon Environment west of Whisky Gulch by 1990, but the Federal leasehold surface area would remain essentially as described in chapter II.

B. DEFER ACTION

For proper cause, the Secretary may defer final action on a proposed mining and reclamation plan. These could include, but are not limited to, the need and time required for:

1. Modification of the proposal to correct administrative or technologic deficiencies.

2. Redesign to reduce or avoid environmental impact.

3. Acquisitions of additional data to provide an improved basis for technical or environmental evaluation.

4. Further evaluation of the proposal and (or) alternatives.

The principal effect of deferring action on a proposed mining and reclamation plan on these grounds would be a comparatively short-term delay in the imposition of all related impacts of the proposal as previously described in the unavoidable adverse impacts section of this statement.

Once a mining and reclamation plan is approved, the regulations and lease terms require that all subsequently proposed departures and deviations therefrom be approved in advance by the USGS. The regulations (30 CFR 211) also permit the USGS to direct that changes be made in previously approved operations. For example, changes could be ordered to accommodate new, improved, or revised administrative requirements, technologic improvements, environmental concerns or requirements, or revisions of prior evaluations thereof in the light of experience or previously unknown factors.

Delayed implementation of the proposed action in order to identify coal markets, or await advances in mining technology, would postpone the impacts described in chapter III. Possibly a higher percentage of the thicker coal sections could be recovered by advanced technology, but other impacts would be as described.

C. PREVENT FURTHER DEVELOPMENT ON EXISTING LEASES

The only alternatives to allowing development of existing leases is to prevent such development or to impose additional conditions and restrictions on the operations. The several apparent means of preventing full development are discussed below.

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, other comparable quantities of coal or sources of energy would be required to meet national needs. The development of other sources and related impacts is discussed later.

1. 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, and future suspensions of operations for reasonable periods, with proper grounds, could be imposed. The Secretary cannot, under present circumstances, suspend operations to the extent that a de facto 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 operations pending legislation remains available. Impacts of this alternative would be similar to those described in subsection C (2), "Cancel the leases."

2. CANCEL THE LEASES (NO NEW DEVELOPMENT)

The Secretary does not possess authority to unilaterally cancel the leases except on the ground defined therein (section 7 or 8 of the lease terms--"Proceedings in case of default"). The authority to cancel on other grounds would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees as may be necessary. The Administration has not entered a request for such legislation, and the Congress has not initiated such action in 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 non-environmental concerns.

Present production could be interrupted temporarily or terminated completely, as could further development of all existing leases.

To the extent that coal production from existing leases was curtailed or halted, alternative sources of energy would be required to meet present needs and demands. These could be foreign and (or) domestic and are discussed in later pages. The time required to replace the resource foregone could range from scant to a number of years, depending on the specific alternative(s) selected and its state of production.

Environmental impacts of the proposals could range widely, depending on the administrative action taken on existing leases. If these leases were cancelled through Congressional authorization, proposed mines would be avoided. Conversely, should development eventually be authorized, environmental impacts as discussed in the impact chapter would occur. The net result would be a deferral and perhaps reduction of impacts through changed technology or requirements imposed at that time.

3. FEDERAL ACQUISITION OF LEASES

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 under subsection C (2).

4. REJECT THE MINING AND RECLAMATION PLANS

Rejection of the proposed mining and reclamation plans would result in no environmental impact on the leased lands, and they would continue in their present condition, subject to modification by natural process and by the condition of other existing activity and uses--and to further modification by the surface owner to meet other uses.

The Secretary may reject any individual proposed activity 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 designed course of action by the lessee (operator). 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 Congress. Viability of this option is dependent upon timely legislative action; the option of rejecting the proposed plans pending legislation remains available. Impacts of this alternative would be similar to those described under subsection C (2), "Cancel the leases."

D. RESTRICT DEVELOPMENT ON EXISTING LEASES

The subject leases convey the right to develop, produce, and market the Federal coal resource thereof if all other terms and conditions have been met by the lessee. In general, the Secretary does not possess the authority to arbitrarily constrict development. 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.

Thus, under present conditions, a general effort to restrict or regulate development of existing leases 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.

E. APPROVE THE MINING PLAN AFTER MODIFICATION

A number of the impacts identified and described in chapter III of this statement could be more fully mitigated by the selective application of those measures described that are supplemental to the proposals of Routt County Development, Ltd., or by implementation of one or more of the alternatives described below. In addition, special conditions could be added to the approved plans relating to the secondary effects of the mining. Such conditions must be reasonable and, if unacceptable to the lessee, could result in the lessee not developing the lease areas with the resultant impacts previously discussed under subsection C (4) "Reject the mining and reclamation plans."

Traffic conflicts and safety hazards to recreationists on Forest Road No. 50227 could be mitigated by developing an alternate route north of Eccles Canyon between Scofield Reservoir and the northern Wasatch Plateau higher elevations. Impacts owing to increased use of these recreational areas could be mitigated by providing additional facilities, restricting use, and establishing adequate land fill dumps and sewer districts.

Socioeconomic impacts identified in chapter III could be mitigated to some degree by utilizing loans, grants, prepaid sales taxes, and planning measures provided by law. These laws are detailed in the Central Utah regional EIS.

Increased populations cause increased impacts to birds perched on powerlines. Perching raptors indiscriminately shot from powerlines could be mitigated by constructing powerlines at least 300 yards from roads.

F. ALLOW DEVELOPMENT OF SELECTED AREAS NOW UNDER LEASE

This alternative would permit only selective exploration and development on existing leaseholds, based on anticipated adverse environmental consequences. The decisionmaker has the authority and responsibility to evaluate the coal resources and impacts of mining on these leases prior to acting on the proposals. Exploration and development could be allowed only on these leaseholds, or portions thereof, that would have the lowest anticipated adverse environmental consequences. Weighing the tradeoffs of mining or precluding mining on selected tracts is part of the evaluation and decision process. Adoption of this alternative would reduce adverse effects by reducing the area in which the impacting activities could take place.

The alternative of allowing the development of only selected areas already under lease constitutes a selective application of the above. Absent a showing lease-by-lease or plan-by-plan of the likelihood of totally unacceptable environmental impacts that could not be reduced to an acceptable level, the Secretary does not possess the authority to otherwise constrain development of the leasehold if all other requirements of the lease have been met. In addition, application of this alternative would not permit maximum recovery of the coal resources and would then 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.

G. COMPANY PROPOSED ALTERNATIVES

The mining company presented five alternative portal locations for entry into the Upper O'Connor bed (fig. 12). They listed the locations in their order of decreasing viability based on mine safety, ecological disturbance, and maximum coal recovery rate at the most profitable unit cost per ton.

The first alternative proposes entry through portals at the Upper O'Connor outcrop in the South Fork of Eccles Canyon near the center of sec. 24, R. 6 E., T. 13 S. The canyon drainage would be preserved by installing reinforced concrete culverts and pads would be constructed to build surface facilities similar to those proposed in Eccles Canyon. The mine plan and mining methods scheduled for the proposed McKinnon No. 1 mine would remain virtually unchanged and the only company identified problem associated with the No. 1 alternative would be constructing the covered conveyor to transport the mine production down the steep, narrow canyon.

The location of the proposed surface facilities for the McKinnon No. 2 mine overlaps the location for the proposed No. 1 alternative to the proposed McKinnon No. 1 (fig. 12). The alternative facilities were considered for entry into the Upper O'Connor (May, 1976) and the McKinnon No. 2 was proposed (November, 1976) for entry into the Lower O'Connor. Although surface facility design would vary slightly because of proposed entry into different coal beds, the environmental impacts to the South Fork of Eccles Canyon caused by the proposed No. 1 alternative would be essentially the same as those described for the proposed McKinnon No. 2 mine. The No. 1 alternative, as proposed, would disturb about 25 acres of surface area, 10 acres more than the proposed No. 2 mine, but about the same amount of road, conveyor, and utilities right-of-way would be required to service either site. Eccles Canyon would not be disturbed by mine facilities west of the South Fork of Eccles-Eccles Junction, but the South Fork is the surface expression of the Connelville fault and any facilities constructed there, especially the settling pond, could cause environmental damage.

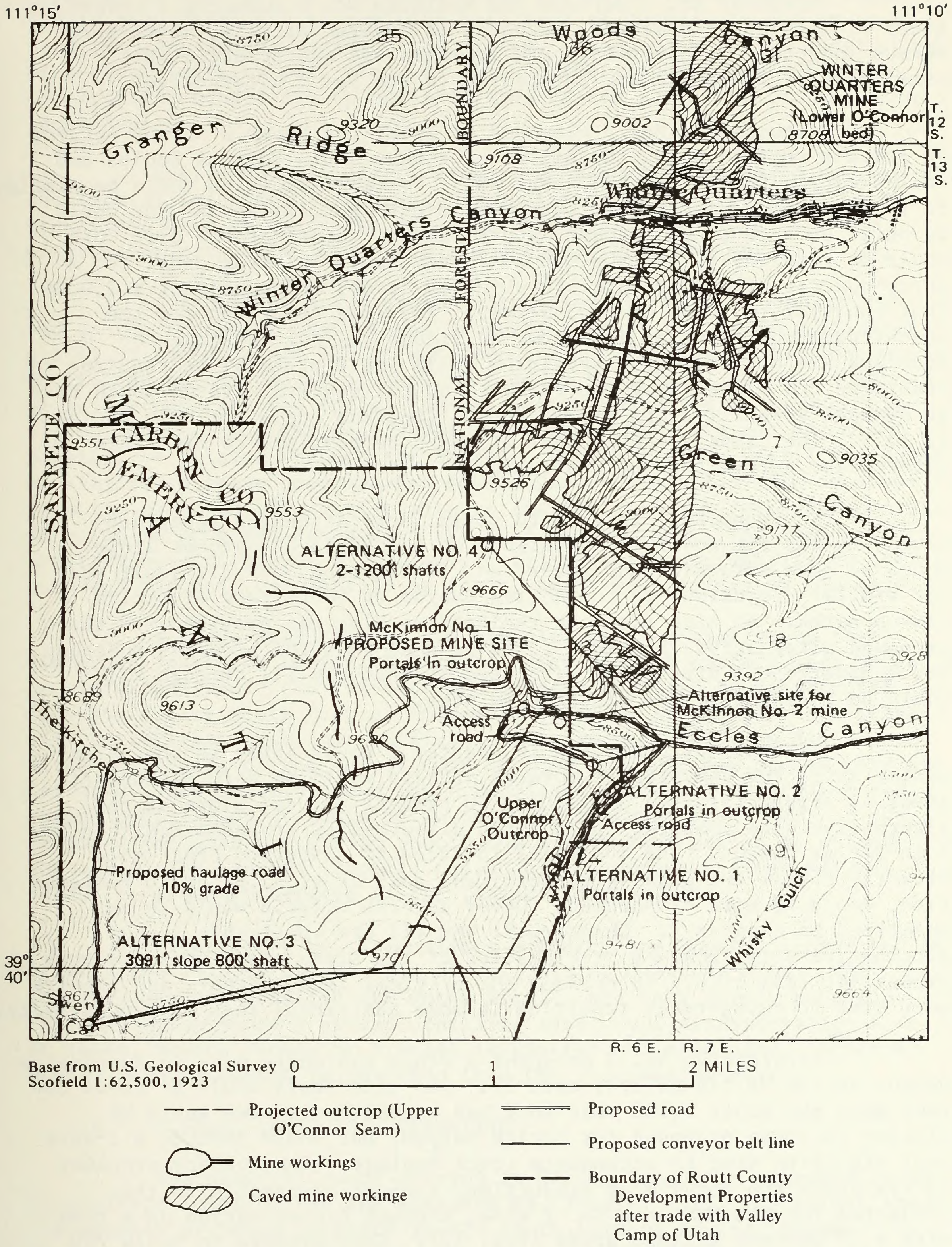


Figure 12.--Map showing access alternatives for McKinnon Nos. 1 and 2 mines.

McKinnon No. 2 surface and McKinnon No. 1 subsurface descriptions of mitigating measures, unavoidable adverse effects, short-term versus long-term productivity, and irreversible and irretrievable commitment of resources are applicable to the No. 1 alternative.

Alternative No. 2 proposed to enter the Upper O'Connor outcrop on private surface along the hillside between South Fork of Eccles and Eccles Canyon (NW 1/4 NE 1/4, sec. 24). Portal facilities would be similar to those proposed for Eccles Canyon (disturb about 25 acres) and would be built on a 50 to 60 percent natural slope. Considerable dirt work would be required to face-up the coal, construct building pads, cut a three-quarter mile road (disturb about 10 acres) and construct a 2,000-foot conveyor (disturb about 5 acres). Possible locations for the access road and conveyor are shown on figure 12, but construction problems are anticipated. Retaining walls would probably be required to stabilize the slope along the roadway and the conveyor system would have an average downhill slope of 10° to 15° (maximum angle for belt haulage is 15°). The company states that it might be possible to make this alternative entry, but not desirable.

Environmental impacts to soils, vegetation and topography caused by the cut and fill operations on the 50 to 60 percent slope would be more extensive and severe and reclamation more difficult than for similar operations at the Eccles Canyon or South Fork of Eccles Canyon sites. No mine plan, or reclamation plan was provided for the proposed alternative; however, it is assumed that the proposed McKinnon No. 1 underground mine plan, discussed in chapters III through VII, would be followed at the alternative site.

Mitigations described in chapter I would apply to the alternative site, but unavoidable adverse effects would be more extensive; about 40 acres disturbed on a 50 to 60 percent natural slope at the alternative site compared to 25 acres disturbed by proposed McKinnon No. 1 in Eccles Canyon. The additonal 15 acres of disturbed area would slightly reduce the grazing capacity and soil erosion, prior to reclamation, would be more pronounced. Other adverse effects would be as described in chapter V. Chapters VI and VII are applicable to the alternative site; however, reclamation of the steep slope would be more expensive, less likely to recover the original land contour, and require more time to revegetate, resulting in some additional loss in productivity.

Alternative No. 3 proposes a slope and shaft mine in Huntington Canyon in the SW 1/4 NW 1/4, sec. 27. The mine shaft would be about 800 feet deep and about 3,100 feet long and portal facilities would be similar to those proposed for Eccles Canyon, but would include a 1-acre coal stockpile area to accomodate truck haulage. The company proposes to transport the total mine production, tonnage comparable to that projected for the McKinnon No. 1 mine, through Eccles Canyon on a road with a 10 percent maximum grade (fig. 12). They propose to build 750 feet of new road, but do not propose to upgrade the existing Forest Development Road No. 50227 on which 75 to 100 ton capacity trucks are expected to make 130 to 200 round trips per day. The company states, "It is very difficult to envision this type of haulage on the present road, or even on an upgraded road system." They provided no underground mine plan, facility plot plan, details on the proposed new road to be constructed, or details on environmental damage caused by the proposed truck haulage.

Environmental impacts cannot be adequately assessed because of the lack of information; however, impacts from road development in the prescribed area to carry the proposed mine traffic would damage the environment more than developing the proposed McKinnon No. 1.

Alternative No. 4 proposes to enter the Upper O'Connor coal bed on the northeast edge of the property through two 20-foot diameter shafts extending about 1,200 feet deep (fig. 12). The production would be limited to the amount of coal that could be hoisted via the shafts; at full production the Eccles Canyon site is scheduled to produce about 11,500 tons per day and only about 7,500 to 10,000 tons per day might possibly be hoisted through the shafts. Portal surface facilities would be similar to those proposed for Eccles Canyon and a 1.5 mile conveyor from the proposed alternative site to the Eccles-South Fork of Eccles Junction is proposed along with 500 feet of new road. The company provided no underground mine plan, facility plot plan, details on the proposed new road, or details on the route of main access to the site.

Acreage disturbed at the portals would be similar to that disturbed in Eccles Canyon, but about twice as much surface area would be disturbed should the conveyor and maintenance road be constructed from the Eccles-South Fork of Eccles Junction to the No. 4 alternative site rather than from the junction to the proposed McKinnon No. 1 site. Although details of the access road or proposed 500 feet of new road are not given, any existing road would require considerable upgrading and environmental impacts would be in addition to those described for the proposed McKinnon No. 1 site should the alternative access be gained through Eccles Canyon. Impacts caused by the proposed alternative cannot be assessed because of the lack of information.

Alternative No. 5 considers entering the Upper O'Connor bed by driving rock slopes upward from the old Winter Quarters mine. The company does not consider the entry viable, and only barely possible. They did not propose a surface facility site, coal transportation mode or route, access route, or provide an underground mine plan. Environmental impacts cannot be assessed from the information given.

H. FEDERAL PROPOSED ALTERNATIVE

The Lower O'Connor outcrop in Eccles Canyon is proposed as an alternative location for the McKinnon No. 2 entry (fig. 12) rather than the company proposed location in the South Fork of Eccles Canyon. Company isopachs show the "A" split to be about 10 feet thick and mineable at the Eccles Canyon outcrop. The entry would have to be driven about 2,500 feet into the "A" split before the rock slope could be driven up into the "B" split, but the entry into the "B" split would be at the boundary of mineable coal in the bed. The "A" split outcrop lies outside the mineable limit of the "B" split and outside the Upper O'Connor outcrop. The Lower O'Connor outcrop in Eccles Canyon is about 800 to 1,000 feet east of the proposed McKinnon No. 1 mine (fig. 12) in a location where the company planned to take "A" split coal in the proximity of the old Eccles Canyon mine which was operated intermittently between 1899 and 1952.

The Upper O'Connor is separated from the Lower O'Connor by less than 100 feet of interburden. Proposed mining of the Upper O'Connor is covered in the McKinnon No. 1 mine plan, but the company does not detail development sequencing between the proposed No. 1 and No. 2 mines to protect the Upper O'Connor bed. The Upper O'Connor isopach shows 12 feet of coal overlying the proposed No. 2 entry in the South Fork of Eccles Canyon and projects coal 4 to 6 feet thick near the outcrop in Eccles Canyon. By entering the Lower O'Connor in Eccles Canyon, underground operations could be more easily sequenced to recover the greatest amount on in-place coal. The company's proposed two portal mining operation, designed to mine two separate coal beds and not be restricted by moving the total production through one portal or by possible accidents and operating problems which could close down a one-portal system, would be preserved.

This alternative site would eliminate all disturbance in the South Fork of Eccles Canyon, about 15 acres for surface facilities and about 11 acres for road, conveyor, and utilities right-of-way, plus eliminate possible environmental hazards caused by building the proposed facilities, especially the settling pond, in the canyon which is the surface expression of the Connelville fault (fig. 3). Locating the McKinnon No. 2 in Eccles Canyon close to the McKinnon No. 1 minesite and adjacent to the main access road and conveyor would require less overall acreage as some facilities could service both mines and the South Fork access right-of-way would not be needed. Environmental impacts caused by locating the McKinnon No. 1 mine in Eccles Canyon are described in chapter III. Impacts to the canyon would change very little, disturbed acreage would increase slightly, by locating the No. 2 portal adjacent to the No. 1 portal.

Legally enforceable mitigations described in chapter I are applicable to the mining plan whether the entry is in Eccles or South Fork of Eccles Canyons. The alternative entry would cause about 35 acres to be disturbed in Eccles Canyon (25 acres proposed for McKinnon No. 1) for portal facilities, but the South Fork of Eccles Canyon would not be disturbed (McKinnon No. 2 plan proposed 15 acres portal facilities, 11 acres right-of-way). Other unavoidable effects would be as described in chapter V. The mining area and anticipated overall coal production would be unchanged by the alternative entry and the short-term versus long-term productivity and the irreversible and irretrievable commitment of resources would be as described in chapters VI and VII.

CHAPTER IX: CONSULTATION AND COORDINATION WITH OTHERS

A. FEDERAL AGENCIES

Bureau of Land Management, Geological Survey, USDA Forest Service, Fish and Wildlife Service, Soil Conservation Service, and National Weather Service.

B. UTAH STATE AGENCIES

Geological and Mineralogical Survey, Division of Water Resources, Division of Water Rights, Division of Health, State Engineer, State Climatologist, Division of Wildlife Resources, Division of State Lands, Division of Parks and Recreation, Department of Transportation, Outdoor Recreation Agency, and Institute for the Study of Outdoor Recreation and Tourism, Utah State University, Logan, Utah.

C. COUNTY AND LOCAL GOVERNMENT

Southeastern Association of Governments

D. PRIVATE INDIVIDUALS AND ORGANIZATIONS, INDUSTRY AND NONINDUSTRY

Bill Davis, Energy Fuels Corporation
Mr. Sanders, Sanders Associates, Inc.
Bob Blackett, Sanders Associates, Inc.
Rick Lyman, Sanders Associates, Inc.
Roger Fry, Sanders Associates, Inc.
Keith W. Welch, Vaughn Hansen Associates

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 air quality: Pasadena, Calif., Final Report.

Archeological Environmental Research Corporation, 1975a, Archeological reconnaissance report - June 13, 1975: unpublished written report.

_____1975b, Archeological reconnaissance report - July 17, 1975: unpublished written report.

_____1975c, Archeological reconnaissance report - October 13, 1975: unpublished written report.

_____1976, Archeological reconnaissance report - July 17, 1976: unpublished written report.

Environmental Research and Technology (ERT), 1978, Regional statement component for the southwest Wyoming coal development; environmental statement - climate and air quality section: ERT document P-3661-B.

Manti-La Sal National Forest, 1976, RIM use source documents.

Mundorff, J. C., 1972, Reconnaissance of chemical quality of surfacr water and fluvial sediments in the Price River Basin, Utah: State of Utah Technical Publication no. 39, 55 p.

Price, Don, 1976, Environmental impact analysis (hydrology), proposed Belina No. 1 underground coal mine: Salt Lake City, Utah, U.S. Geological Survey unpublished report.

Price, Don and Waddell, K. M., 1973, Selected hydrologic data in the Upper Colorado River Basin: U.S. Geol. Survey Hydrol. Inv. Atlas, HA-477.

Rapin, D., 1977, Soil resource inventory, Ferron-Price planning unit, Manti-La Sal National Forest: 75 p.

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

Speiker, E. M., 1931, The Wasatch Plateau coal field, Utah: U.S. Geological Survey Bull. 819, 210 p.

Torgeson, D., and Carpenter, B., 1977, National Forest visual resource management system: USFS unpublished written report.

Utah Division of Parks and Recreation, 1976, Visitation record - 1976.

Walker, J. Terry, 1977, Archeological investigations on Trough Springs Ridge and near the Huntington Canyon - Electric Lake Dam: Prove, Utah, Brigham Young University, unpublished written report.

Ward, Lorin A., 1973, Elk behavior in relation to multiple uses on the Medicine Bow National Forest, West Assoc. State Game and Fish Comm.: Salt Lake City, Utah, Proc. 53: 125-141.

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

Wikle, Les, 1977, Archeological reconnaissance report - August 30, 1977: USFS unpublished written report.

Wilson, L., Olsen, M. E., Hutchings, T. B., Southerd, A. R., and Erickson, A. D., 1975, Soils of Utah: Logan, Utah, Utah State University, Agricultural Experiment Station Bull. 492, 94 p.

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

Mountain States No. 1 Mine

Lease No. U-5135

Proponent: Mountain States Resources Corporation

Site Specific Statement

Mountain States Resources Corporation

Mountain States No. 1 Mine

CONTENTS

Page

ILLUSTRATIONS

TABLES

MOUNTAIN STATES RESOURCES CORPORATION

MOUNTAIN STATES NO. 1 MINE

CHAPTER I: DESCRIPTION OF THE PROPOSED ACTION

A. INTRODUCTION

The Mountain States Resources Corp. has submitted for approval a plan to mine 500,000 tons of bituminous coal per year from approximately 1,800 acres of leased Federal land (table 1; Federal lease No. U-5135). The purpose of this statement is to analyze environmental impacts that could result from approval of the mining plan. Future modification of the plan may require additional impact analysis at a later date.

The company has also submitted preliminary proposals for transportation, utilities, and other facilities needed to implement the mining plan (table 1). Some of these are off the lease area. These proposals are analyzed only to the extent of information submitted and to determine other major impacts that may eventually result from approval of the mining plan. Future Federal actions and additional environmental assessment will be required when applications with detailed plans for these proposals are submitted for approval.

The proposed underground mine No. 1 is in the southern part of the Emery coal field south of I-70 and east of U-72 in southeastern Sevier County (fig. 1). Access is from I-70 by way of Fremont Junction Interchange and then south 9.5 miles along U-72. The 1,800 acres to be mined is in the northern part of a Federal leasehold of 8,823.88 acres on U.S. Forest Service (USFS) and Bureau of Land Management (BLM) administered lands. The company plans to eventually mine the entire area from six separate continuous and overlapping underground mines. Plans for mines Nos. 2-6 are preliminary and proposed production from these mines is included in the high level scenario discussed in part 1 chapter VIII.

Two coal beds proposed for mining are in the lower part of the Ferron Sandstone Member of the Mancos Shale of Late Cretaceous age. Preliminary drill data indicate that the beds (D & E) are 0 to 8 feet thick and 20 to 30 feet apart. Beds less than 4 feet thick will not be mined. Overburden above the higher (E) bed ranges from 0 at the portal site to a maximum of 910 feet.

1. MINE-PORTAL FACILITIES

Underground mining plans have not been developed in detail for the Mountain States No. 1 mine development plan and projected mining sequence is part of the submitted mining and reclamation plan. This information is available for public review in the office of the

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

Lease holdings (acres)	Total	Included in plan
Federal lease	8,824	1,800
State lease	1,280	0
Total	10,104	1,800
Product	Raw coal	
Market	Unspecified	
Estimated coal reserves in million tons:		
In place	21	
Recoverable (50 percent)	10.5	
Expected mine life (years)	22	
Production rate (mty)	0.5	
Development schedule (years)		
Initiation to production	1	
Initiation to full production	2	
Ancillary requirements[1]		
Company preliminary proposals	Portal to Fremont Jct. powerline.	
Non-proposed State Highway	14-acre dam and reservoir in Last Chance Creek. Upgrading U-72 to 32-foot graded road, 3 acres.	
Surface disturbance		
Portal facilities	12 acres	
Rock-waste pile	4 acres	
Company road (0.57 mile)	3 acres	
Powerlines (8.5 miles)	10 acres	
State Highway (8.9 miles)	32 acres	
Water System	14 acres	
Drain field	2 acres	
Major resource requirements		
Water (acre-ft/year)	25	
Personnel requirements		
Construction	25	
Mine operation[2]	145	

[1]Preliminary plans subject to future environmental assessment.
[2]Based on 15 tons per manshift (includes support).

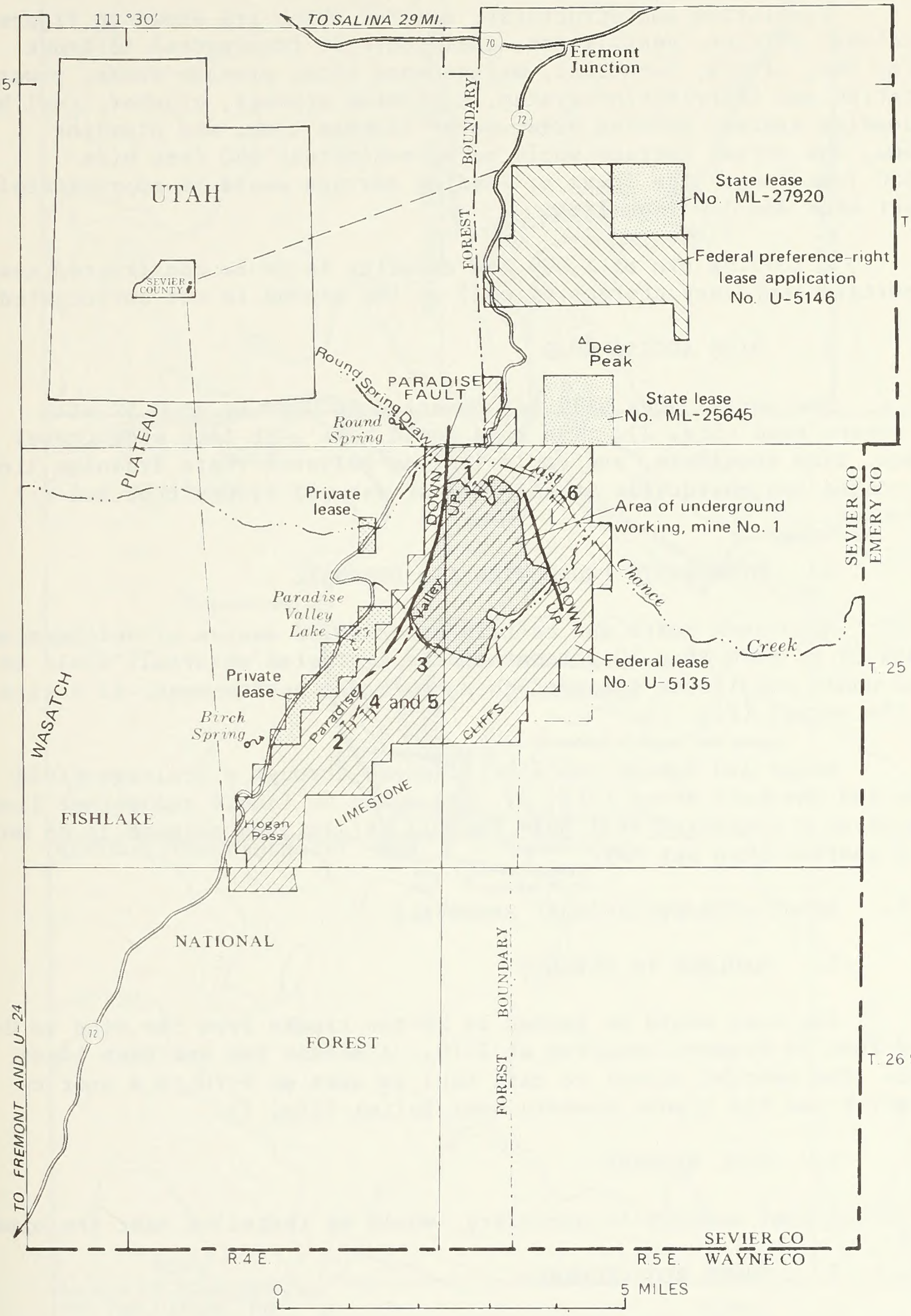


Figure 1.--Index map showing coal leases and proposed sites of the Mountain States mines Nos. 1-6, Sevier County, Utah.

Area Mining Supervisor, USGS, Salt Lake City, Utah.

Facilities and structures, some of which are shown on figure 2, include: entries, ventilators, coal conveyor from portal to truck loading bin, office, bathhouse, maintenance shop, storage sheds, power substation and distribution system, explosive storage, crusher, coal bin and loading system, parking area, water storage tank, and pipeline system. The portal terrace would be approximately 160 feet wide and 800 feet long. The lower or loading terrace would be approximately 80 feet wide and 300 feet long.

A loading bin of 2,000 ton capacity is to be constructed near the portal; temporary storage of coal on the ground is not anticipated.

2. MINE ACCESS ROAD

The portal area will be connected to U-72 by an 0.57 mile long access road (fig. 2). The road would have a 26 feet wide travel surface, plus shoulders, and would include culverts where drainage lines are crossed and guardrails at all fill or natural slopes that are 2:1 or steeper.

3. MINE-WASTE PRODUCTION AND DISPOSAL

Mine-rock waste and certain other solid wastes of undetermined amounts (1 to more than 10 percent of the extracted material) would be stored under conditions designed to protect the environment, at a site near the portal (fig. 2).

Water and sewage would be disposed through a drainage field of one and one-half acres (fig. 2). It would be fenced and either lined or built on a compacted soil base capable of limiting seepage to no more than a quarter-inch per day.

B. ASSOCIATED PRELIMINARY PROPOSALS

1. HAULAGE TO MARKETS

The coal would be hauled by 25-ton trucks from the mine to U-72 and then to Fremont Junction at I-70. A market has not been identified. The nearest access to rail haul is west on I-70 to a spur on the Denver and Rio Grande Western near Salina (fig. 1).

2. COAL WASHERY

A coal washery if necessary, would be installed near the mine.

3. POWER REQUIREMENTS

Utah Power and Light has constructed (1978) a 25 KV power transmission line from the Emery powerplant to a substation near Fremont

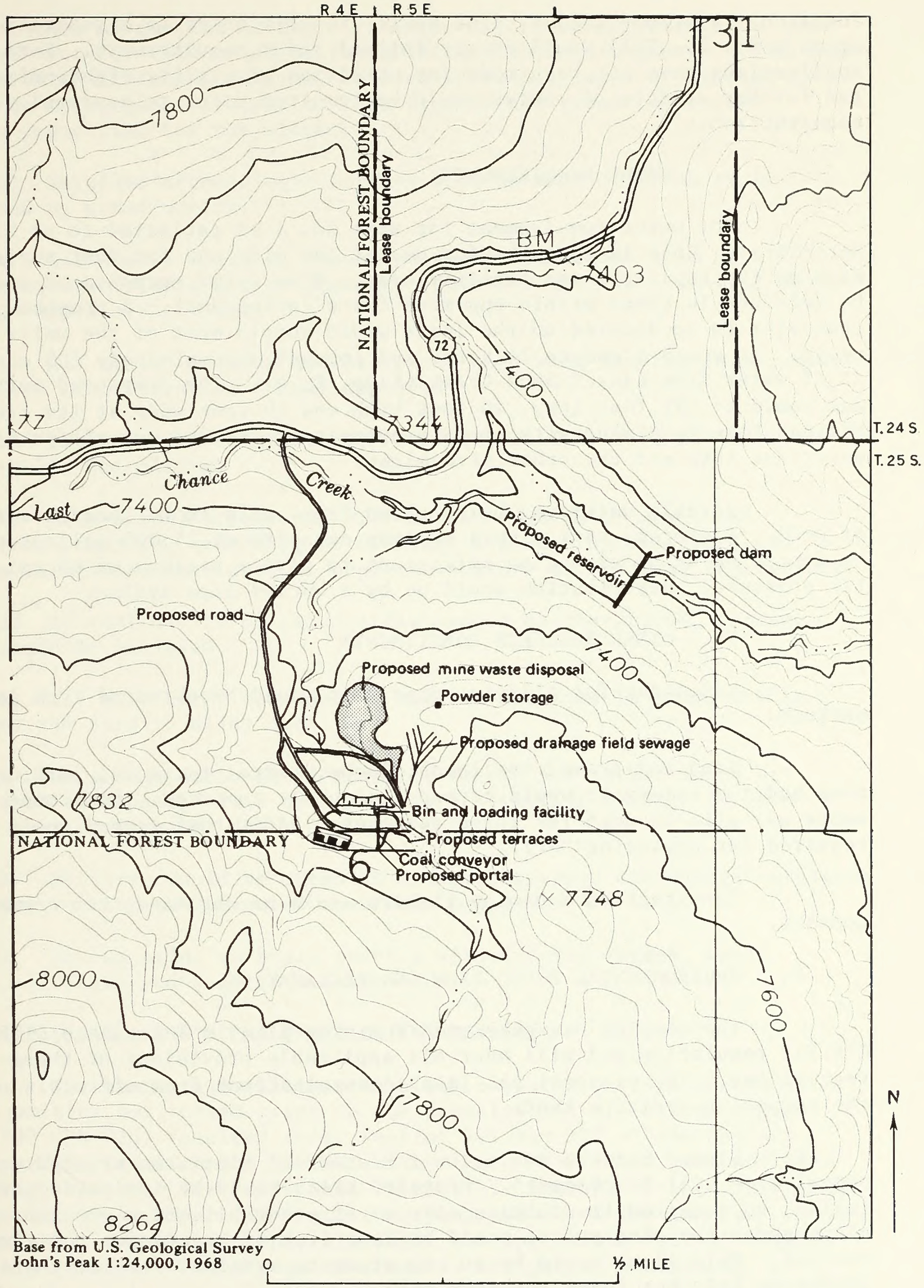


Figure 2.--Proposed development plan for the Mountain States No. 1 mine surface facilities in the Last Chance Creek area.

Junction. A proposed 25 kV line would transmit power to a substation at mine No. 1. This would supply initial power requirements. Formal applications have not been made for utilities or utility rights-of-way, and further studies of routes would be required prior to approval for construction.

4. WATER REQUIREMENTS

The water requirement for mine No. 1 is estimated to be 25 acre-ft/yr. This is adequate for use at the mine and for dust suppression on the haul road and facility area. Mine water encountered would be retained in sumps within the mine for allaying dust. A proposed reservior to be located on the lease would supply most of the water needs. It would inundate 14 acres and impound approximately 100 acre-ft of water from Last Chance Creek (figs. 2, 4). The compacted earthfill dam would be 295 feet long, 40 feet high and 20 feet wide at its crest. Filings have been made with the State Engineer for 365 acre-ft/yr of water for this and the other five mines.

Potable water may be supplied from wells to be located west of U-72. A storage tank with a minimum capacity of 25,000 gallons would be installed at an elevation sufficient to give a minimum of 60 psi static pressure. Distribution would be by a buried pipe system.

5. OTHER RESOURCE COMMITMENTS

Limestone for allaying mine dust would be obtained from local markets.

Sand and gravel for roads, loops, portal terraces, parking area and the reservoir would be supplied under contract. Some mine waste may also be used for these purposes. Additional gravel would be required for upgrading U-72.

Construction and mine timbers would be obtained from commercial sources.

C. ENVIRONMENTAL PROTECTION AND RECLAMATION

The company has submitted a mining plan in accordance with 43 CFR 211 regulation and will meet all applicable provisions of these regulations. The proposal and later communications from officials of the companies indicate that:

(1) Slopes between and below terraces and platforms created at the portal area will be reseeded. Reseeded areas would be irrigated periodically, as required to minimize effects of prestablization erosion. The slope above the mine portal would be kept free of vegetation for fire-control. This slope would be on the steep to vertical face of the thick sandstone bed that forms the mine roof.

(2) All cut and fill slopes along the access road will be covered

with 4 inches of topsoil stripped from the area before excavation. The slopes except for rock would be revegetated with native plants. The lower parts of high fills and cuts may be covered with a layer of riprap, 12 inches or more thick, instead of with topsoil and grass to provide erosion protection for the slopes.

(3) Detailed archaeologic surveys will be made of areas to be disturbed by construction.

(4) Guardrails would be installed along the access road at all fill or natural slopes 2:1 or steeper. Culverts will be installed where drainage lines are crossed.

(5) All mining methods and equipment used will be Mine Enforcement and Safety Administration (MESA) approved.

(6) Barrier pillars about 200 feet wide will be left in the mine along faults and cliffs.

(7) Mine-portal structures will be constructed of steel and reinforced concrete, according to standard engineering practice, and will be maintained according to applicable State and Federal regulations.

(8) If coal has to be temporarily stored on the ground, storage areas would be enclosed.

(9) Any mine water encountered will be retained in sumps within the mine and used to allay dust.

(10) The sewage drain field would be fenced and either lined or built upon a compacted soil base capable of limiting seepage to no more than a quarter-inch per day.

(11) Measures would be taken to mitigate seepage and damage resulting from constructing the proposed reservoir and dam.

(12) Reclamation, to begin shortly after mining ceases, would follow all State and Federal requirements.

D. LEGALLY ENFORCEABLE MITIGATING MEASURES

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 and Reclamation Act (SMCRA) of 1977 (PL 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, in this statement the applicable initial regulations are considered as a required Federal mitigating measure.

The mining and reclamation plans will be returned to the company together with a request that they be revised in accordance with the applicable initial regulations. As soon as the mining and reclamation plans are revised and returned to the Geological Survey (GS) they will be evaluated with the Office of Surface Mining to determine compliance with the requirements of Federal regulations at 30 CFR 211 and 30 CFR 700. The mining and reclamation plans cannot be approved until they conform to all applicable requirements.

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 surface management agency.

Reclamation to restore vegetation to 90 percent of original productivity may require as much a 10 years, and, if so, it will be required. (See part I, chapter IV.)

Woodland products, such as fence posts and firewood, will be salvaged ahead of the land-clearing phase of construction and development. Exploratory, construction, and mining activities will not be permitted until a site specific survey is made to determine the presence or absence of endangered and threatened lants, especially Townsendia aprica.

Any endangered and threatened plants or animals present and their critical habitat will be protected from encroachment and other negative impacts.

Areas disturbed by construction and not covered by facilities will be revegetated to reduce erosion, in accordance with USFS requirements.

Where screening from the traveling public is not possible, mine facilities will be designed, constructed, and painted to blend with the natural landscape.

Access roads will be designed and located to take full advantage of natural contours, where excessive cuts and fills are not needed, in accordance with USFS and BLM specifications.

Mine-portal surface facilities will be fenced to exclude livestock and to avoid other conflicts between land uses.

Those parts of fill slopes resulting from road construction that would not be covered with rock riprap will be covered with topsoil, and then revegetated and irrigated, in accordance with the requirements of the appropriate regulating agencies.

Maps showing areas of potential subsidence based upon geologic and engineering data and a proposed subsidence monitoring system must be submitted with proposed underground coal mining plans to satisfy the requirements of 30 CFR 211.

Subsidence fractures that form as a result of mining, and that are considered by the appropriate regulatory agencies to be wide and deep enough to entrap livestock and wildlife, will be fenced.

The waste-rock pile will be shaped, compacted, graded, and protected by drainage ditches or bars to reduce contact with runoff water and the likelihood of erosion and landsliding.

When the waste-rock pile is no longer in use, it will be reshaped to blend with the surrounding topography, covered with a soil layer of a thickness approved by the appropriate regulatory agency, and revegetated and irrigated in accordance with the requirements of that agency.

Hydrologic maps and data must be sumbitted with proposed mining plans to satisfy the requirements of 30 CFR 211. This information should normally include: (1) a baseline survey report that assesses ground water and surface water in the vicinity of the proposed operation and discusses probable hydrologic impacts of proposed activities and that (2) details a hydrologic-monitoring program designed to monitor ground water and surface water continuously throughout the life of the proposed operation.

All mining activities will meet the requirements of the Federal Water Pollution Control Act Amendments of 1972, PL 92-500. Construction of the proposed reservoir and the discharge of dredged or fill materials in or adjacent to Last Chance Creek shall be approved by the U. S. Army Corps of Engineers or EPA, whichever is applicable, in accordance with Sec. 404 of the Federal Water Pollution Control Act Amendments of 1972.

The waste-rock pile and the sewage drain field and such facilities as the bathhouse, coal storage, and oil and gas depots, will not be located on areas that would be undermined and subject to subsidence. They will be removed from main drainage channels and lined or placed upon impermeable material, to prevent excessive seepage and accidental spillage.

No wastes shall be placed where they will pollute any waters, and no waste water shall be discharged or allowed to enter any waters unless it meets the water-quality standards required by the State of Utah (Title 73-14-1, et. al.) or EPA, whichever is applicable.

If the flow or yield of any springs, streams, or wells, from which water has been appropriated or which are deemed significant to the human environment, is reduced by mining, the company will 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. In order to have the information needed to determine the effect of mining on water, the company will be responsible for inventorying said water resources before mining and for monitoring the flow of springs and streams, the water level in wells, and the chemical quality of these waters during mining.

Garbage and other solid wastes other than mine-waste rock will be disposed in compliance with EPA regulations.

The old prospect portal that will be reopened and converted into a ventilation entry will be protected to prevent surface drainage from entering the mine and possibly contaminating the ground water.

Wetting, paving, or other dust stabilization will be required on the mine-haulage and other on-lease roads to reduce environmental damage and to enhance travel safety.

Each 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 should use an appropriate combination of the following fugitive dust controls:

1. Pavement or equivalent stabilization of all haul roads used or in place for more than one year.

2. 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.

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

4. 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.

The authorizing office will comply with the basic 1906 Federal Antiquities Act (PL 59-209; 34 Stat. 225), the National Historic Preservation Act of 1966 (PL 89-665; 80 Stat. 915), the Historical and Archeological Data Preservation Act of 1974 (PL 93-291), and the subsequent Federal regulations which provide legal backing and instructions for cultural resource inventory and protective consideration of sites.

No mining or rights-of-way will be approved until the surface management agency has coordinated professional cultural resource (cultural resources include archeological, architectural, and historical remains) surveys with the Utah State Historic Preservation Officer and mitigation may be necessary if surface evidence indicates further evaluation is necessary. In the event of discoveries of buried cultural resources as the result of exploration or mining activities the operator will notify the GS and the surface management agency immediately and suspend operations.

CHAPTER II: DESCRIPTION OF THE EXISTING ENVIRONMENT

A. NATURAL ENVIRONMENT

1. CLIMATE

The regional climate is described in part I. Temperatures at the minesite are probably 3° to 5° cooler than at Emery, 20 miles northeast and 1,200 feet lower. Average monthly temperatures at Emery range from about 25°F in January to 70°F in July. Average annual precipitation is 12 inches and 20-25 inches in the upper reaches of Last Chance Creek. The 100-year 6-hour precipitation is 2 inches. Snow can be expected from November through March, and maximum accumulations average 20-30 inches. Potential evaporation is about 40 inches.

2. LAND

a. Land Surface

The proposed mine underlies a bench on the southeast face of the Wasatch Plateau. The general area is moderately to deeply dissected by streams draining to the northeast and southeast. The Paradise fault is the western boundary of the mine and another fault and a deeply washed canyon form the eastern boundary (fig. 1). Within the area of mine No. 1, the lowest altitude is 7,200 feet, in Last Chance Creek, below the proposed reservoir, and the highest is 8,594 feet, in the center of the area to be mined. The maximum local relief in the canyon of Last Chance Creek is 750 feet.

b. Geology

The mine will develop coal from the Emery coal field. (fig. I-2, part 1, chapter I).

The relation and quality of the coal fields and regional geologic setting is described in part 1, chapter II.

The Ferron Sandstone Member of the Mancos Shale consists mostly of thick to thin resistant sandstone beds, and contains all the coal beds of the Emery coal field. Within the mine area is the oldest exposed geologic unit the Ferron Member and forms the steep part of the cliffs and the floor of some streams. The Blue Gate Shale Member overlies the ferron and forms the upper part of the cliffs and much of the plateau. The Blue Gate Shale Member and, to a somewhat lesser degree the Younger Masuk Member, contain appreciable amounts of poorly resistant shale and mudstone locally, and some beds rich in swelling clay. Younger units, are exposed west of U-72 (fig. 1).

Extensive landslides exist near mine No. 1, but no large slides are known within the mine area.

The Paradise fault is a northward to northeastward trending vertical or high-angle normal fault, down dropped on the west; vertical displacements are not known but are presumably considerable. Near and adjacent to the leases, much of U-72 lies along or near the Paradise fault. Several other faults have been discovered during reconnaissance mapping and preliminary drilling. They generally trend north and northwest, and have vertical displacements generally less than 100 feet. The north- northwest fault at the eastern boundary of the mine area is down dropped about 60 feet on the east.

Mine No. 1 is on a gentle anticlinal fold on the west limb of the north-plunging Dear Peak syncline (Doelling, 1972). The average dip of coal beds and surface rocks is only about 3 degrees northwest to northeast but higher dips are present near the south end of the mine area (Doelling, 1972, p. 479, 480).

The thick sandstone beds of the Ferron Member exposed along cliffs are highly jointed, in two or, in places, three directions. The more prominent joint planes are vertical or nearly so.

The project area has not been surveyed for paleontological resources. A general summary of the principal fossilferous formations, ages, number of known fossil localities, and general fossil types is presented in part 1, chapter II.

c. Minerals

The beds to be mined are the D and overlying E beds of the lower part of the Ferron Sandstone Member (part 1, chapt. II). They are generally thin and are poorly exposed along the Limestone Cliffs and within drainages that dissect the cliffs.

The D bed is not present at the portal nor in the northern part of the proposed workings. It appears as a featheredge in the central part of the proposed mine No. 1 workings and thickens to about 8 feet at the South end.

The overlying E bed is exposed above Last Chance Creek at the portal site. It is 1 to 8 feet thick and thickens and thins irregularly. The interval between the D and E beds is 20 feet at the approximate pinchout of the D bed and increases to 30 feet in the south edge of the mine area. In the northern part of the mine area, where the D bed is absent, the E bed lies 380 feet above the A bed, a thicker and more extensive underlying bed.

Underground mining elsewhere in the Emery coal field has commonly been hampered by unfavorable roof or floor conditions (Doelling, However, the E bed, where exposed along Last Chance Creek and near the portal, is directly overlain by a sandstone bed 10 or more feet thick. Where present and persistent, this sandstone bed should make a strong, competent roof in underground workings at mine No. 1.

In a summary on the lease areas, supplied to the proponents by Dr. H. H. Doelling of the Utah Geological and Mineralogical Survey, coal quality, from proximate analyses is as follows:

	D bed	E bed
Number of samples in composite sample----	4	6
Percentiles:		
Moisture----------------------------	9.2	7.2
Volatile matter---------------------	38.4	40.9
Fixed carbon------------------------	45.5	45.5
Ash---------------------------------	6.9	6.3
Sulfur------------------------------	0.85	1.63
Btu/lb------------------------------	10,985.0	441.0

These figures are very close to average for the Emery coal field as a whole (part 1, chapt. II).

The coal is high-volatile C bituminous coal, of good quality, but with moderate sulfur content and fairly high in ash.

Coal from drill cores commonly contains disseminated grains and thin streaks of pyrite. Pyrite also appears concentrated in the upper few inches of the E bed. Apparently much of the sulfur is concentrated in the pyrite. Washing tests on bulk samples of coal has been recommended, to determine the most effective method for removing the sulfur. The D bed seems to contain coal of higher quality than coal in the E bed. Coal quality ranges widely, not only from bed to bed, but also from sample to sample within the same bed. To produce a uniform low-sulfur coal, quality control would be necessary during mining.

The nearest mining has been at the recently operated Dog Valley mine of Western States Coal Corp., 7 miles northeast. The abandoned Willow Basin mine lies near the southern border of Lease No. U-5135 (fig. 1), 4 miles southwest of mine No. 1. The abandoned Paradise and Willow Spring mines lie beyond the boundaries of the proposed action.

The coal leasehold is overlapped by Federal oil and gas leases. Several test holes have been drilled in the desert east of the canyon of Last Chance Creek, east of the proposed action. A deep well was drilled 4 miles west of the Paradise fault, but no significant oil or gas discoveries have been made.

d. Soils

Soils are derived from the Ferron Sandstone and Blue Gate Shale Members and to a lessor extent from gravel deposits consisting mainly of basaltic volcanic rocks. The soils are well drained, range from very shallow to moderately thick (as thick as 40 inches), and are generally gravelly to stony. Textures of soils formed from sandstone are commonly sandy loam to loam, and soils formed from shale are commonly silt loam to silty clay loam. Calcium carbonate and gypsum accumulations are commonly found in the subsoil.

Mining facilities and the haul road are proposed on landtypes 222 and 223, as described in the Environmental Analysis Report of the Paradise Coal Fields, Loa Ranger District, Fishlake National Forest (1976). These landtypes are described as follows:

Type Number	Description
222	Stony sideslopes with pinyon-juniper cover. Moderate erodibility, with high erosion hazard due to slope and sparse ground cover. Stable, but subject to some rock fall.
223	Ledges and barren sideslopes, with scattered pinyon-juniper vegetation. Erosion hazard and current erosion are both high. Rock fall is the most pronounced form of instability.

3. WATER

a. Water Supply

Water supplies on and near the lease area are scanty. Available water is used by wildlife and livestock.

1. Surface Water

The proposed mine is in the watershed drained by Last Chance Creek, an east-flowing intermittent tributary to Muddy Creek (fig. 1; fig I-2, part 1). Perennial flow occurs in the upper part of the basin above the mine. Some water is stored in a small reservoir in the headwaters and is released during the growing season for irrigation on a ranch downstream from the proposed mine. The drainage area upstream from the proposed mine water reservoir is 24 square miles. Runoff is estimated to average 5 inches per year, or 6,400 acre-feet. The 50-year floodflow is estimated to be 1,500 cfs.

The part of the leasehold to be developed by mine No. 1 is drained by small ephemeral tributaries to Last Chance Creek. Average annual runoff is about 150 acre-feet.

2. Ground Water

Ground water east of the Paradise fault is scarce and deeper than that west of the fault. Test borings to the coal beds in the Ferron Sandstone Member were relatively dry, indicating that perched water is scant east of the fault. Ground water in the lease area dominantly originates in a recharge area in the high and moist plateau (10,000 feet higher) to the southwest.

West of the Paradise fault, springs are more plentiful. The fault has displaced the Emery Sandstone Member to the west down against tighter sandstone and shale of the Ferron and Blue Gate Members on the east. Water in sandstone and alluvium apparently backs up and surfaces as springs. For example, perennial springflow at Round Springs, which is 1 1/2 miles upstream from the proposed reservoir, issues from alluvium overlying the Emery Sandstone Member. The flow seeps into the Ferron Sandstone Member after crossing the Paradise fault.

Regional studies show that the water table is as much as 500 feet below the plateau surfaces, but much shallower in the ravines and canyons (Price, 1973). Water wells generally yield less than 50 gal/mln. from fractures and joints in sandstone and shale. A possible aquifer, the Dakota Sandstone, lies 1,300 to 1,500 feet beneath the coal beds at mine No. 1. However, its water-bearing characteristics here are not known.

b. Water Quality

Paradise Valley Lake (fig. 1) is fed from several springs issuing from rocks to the west of the Paradise fault. Though the lake is brackish, the main spring feeding it, Birch Spring, is somewhat fresher. Spring water hardness is 310 mg/L, alkalinity is 410 mg/L, and pH is 8.7, according to the proponent's records. Regional studies indicate that ground water contains 500 to 1,000 mg/L dissolved solids.

4. AIR

Particulates are the only pollutants which might significantly degrade air quality at the Mountain States Resources No. 1 mine. Concentrations of other pollutants such as sulfur dioxide, nitrous oxides, carbon monoxide and photochemical oxidants would not be significantly increased.

Air quality has not been monitored near the site. However, an annual average background level for TSP for rural southern and central Utah locations of 20 micrograms per cubic meter ($\mu g/m^3$) has been estimated (AeroVironment, 1977). The short term TSP standards can be exceed in many areas of rural Utah as a result of wind blown dust.

The background visual range, based on the background TSP level was estimated to be 37 miles (60 km) (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 demonstrated an average of 67 miles for the period September 1970 to March 1971. Average visual range calculated from particle size distribution at Bear Creek and Huntington Canyons in 1974 was approximately 45 miles.

Analysis of photographs taken at Calwson, Utah 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 have shown averages between 94 miles in November-December 1976 and 54 miles in April 1977 (Pueschel et. al 1978).

5. VEGETATION

Most of the area is covered either by the Pinyon-Juniper Woodland type (fig. 3) or the Sagebrush-Grass type. Typical plants in the Pinyon-Juniper type are pinyon pine, Utah juniper, big sagebrush, Indian ricegrass, blue grama, and bitterbrush. In the Sagebrush-Grass type, these plants are found: big sagebrush, black sagebrush, fringed sagebrush, blue grama, Indian ricegrass, rabbitbrush, bluegrass, and bitterbrush. These types are described in more detail, including a species list, in the task force files.

One plant, Townsendia aprica, proposed for the endangered plant species list, was collected along U-72 6 miles south of I-70. This location is 2 miles north of the mine-portal area and immediately beyond the Mountain States leaseholds. This recently discovered species, may be on the verge of extinction due to trampling by cattle driven through the area. Two other plants, Astragalus loanus (endangered) and Castilleja scrabrida (threatened), are known to occur or were collected in the vicinity of the leaseholds. These two species are judged to be so widespread as to warrant their removal from the official list (Welsh, 1977).

6. WILDLIFE AND FISHERIES

A wide variety (355) of wildlife inhabit the mine No. 1 area (Dalton and others, 1977). Better known species include mule deer, elk, cougar (mountain lion), black bear, blue and ruffed grouse, mourning doves, coyotes, bobcats, raptors, cottontails, and snowshoe hares.

The proposed mine would be located on winter deer habitat, in the southern part of Utah's deer herd unit 45 (Last Chance). Winter range is the limiting factor on the deer populations in this unit. Although the available vegetation could winter 5,753 head of deer on unit 45 (written commun., Wilson, UDWR, 1977). The optimum population is somewhat less as is shown in table 2.

Figure 3.--Photograph looking south at the proposed site of the Mountain States No. 1 mine portal. The portal terrace would be about one-third down from the top of the photo and would extend to the large dry wash on the left side of the photo. The bin and loading facility terrace would be below the portal terrace. The access road would follow down right side of the large wash.

Table 2.--Deer herd unit 45 winter range and optimum population

Vegetative type	Normal Winter (acres)	Severe Winter (acres)	Optimum deer population
Pinyon-Juniper Woodland---------	70,867	51,580	3,360
Sagebrush-Grass----	16,224	7,309	873
Total-----------	107,366	69,909	4,233

The proposed mine is within year-round elk range. Elk winter range comes within a mile of the proposed portal. U-72, between the proposed minesite and I-70, essentially parallels 3 miles of the easternmost edge of the winter range. Mountain States Resources coal leases are within Utah's Fishlake Elk Unit, which produced over 8 percent of the State's elk harvest during 1971-75.

Cougar are found in the vicinity of the proposed mine. These usually solitary animals establish home areas closely associated with the seasonal distribution of deer, which are their primary food source. Seidensticher and others (1973) found in their study of cougar in Idaho that yearly home areas of individual animals ranged from 67 to 175 square miles. Winter-spring home areas ranged from 12 to 38 square miles in 1971-72 and from 24 to 94 square miles in 1970-71, whereas summer-fall home areas ranged from 41 to 113 square miles in 1970-71.

There are no simplified census methods to determine cougar populations, but based on reported harvest figures for unit 45, a moderate number were taken during 1971-77, 14 by sport hunters, compared with 31 in the top cougar-producing unit in the State during the same period (Fair, 1977). In the most recent reporting period, July 1976 through June 1977, sport hunters spent 32 man-days taking 4 cougars in unit 45, whereas 9 were taken in the leading unit.

Black bears are found on the Wasatch Plateau, including the coal lease area. Black bears are essentially solitary animals regardless of population (Seton, 1909) and avoid human beings. Seasonal movement is generally dictated by food availability (Skinner, 1925). Various studies reported by Bray and Barnes (1967) indicate that black bear males may have home ranges as large as 700 square miles; others found home ranges to be as small as 32 square miles for females. One source concluded home range varies with topography and food supply (Bray and Barnes, 1967).

The black bear population in the mine vicinity may be rated from moderate to moderately low. Based on reported harvest, three black bears have been taken from unit 45 in the 1967-76 period of record, compared with 37 taken in the top black bear producing unit (Fair, 1977). In 1976, no bears nor hunter days were reported from the unit.

Cottontail rabbits and several ground squirrel, chipmunk, and mice species are found throughout, snowshoe hares are found in scattered pockets of suitable habitat. A predator-prey association exists between most of these species and badgers, skunks, bobcats, coyotes, foxes, and raptors.

Raptors use the entire mine area year-round, nesting on cliffs and ledges or in trees, depending on species preference. The entire area provides hunting fields for small animals, birds, and reptiles. The endangered peregrine falcon's range includes the mine area; however, there are no known aeries here.

Blue and ruffed grouse may be found in the vicinity, and mourning doves are common spring-summer nesting residents. A wide variety of perching birds inhabit the mine area year-round. Waterfowl and shorebirds use the Paradise Lake area from spring thaw to fall freeze for migration stops, nesting, brooding, and feeding.

Endangered Utah prairie dogs (Cynomys parvidens) were transplanted to a site near the proposed mine No. 1 in 1976. The transplant was made under a comprehensive long-range recovery plan in an attempt to bring them back from threatened extinction. The transplant was a cooperative effort among the Utah Division of Wildlife Resources, U.S. Fish and Wildlife Service, and U.S. Forest Service. The area is within the Utah prairie dogs' historical range.

Several lizards, snakes, and other reptiles are found throughout.

There are no gamefish in the area of the proposed action.

B. CULTURAL ENVIRONMENT AND LAND USE

1. LAND

Most of the 1,800 acres to be mined is administered by USDA Forest Service; the Fishlake National Forest and is included in the Salina-Fremont Planning Unit. The management directive allows for coal development, coordinated with other resources and values, with special emphasis on protecting watersheds and critical elk winter range; that gives priority to allocating increased grazing capacities to big-game species commensurate with the need to maintain big-game populations to about their present numbers; that maintains water-quality standards; that requires extensive transportation planning in conjunction with coal development; that regulates ORV use during the winter to protect winter big-game habitat; that surveys and protects archeologic sites; and that initiates big-game habitat improvement and watershed rehabilitation.

Sevier County zoning ordinances authorize developing the land for mining. The area is zoned for grazing, recreation, forestry and wildlife, but allows mining.

2. RANGE AND TIMBER

The following table shows present grazing by cattle in the general area:

Allotment	Seasons	Numbers	AUM's
Deer Peak (BLM)---------------	3/6-6/15	147	485
Last Chance (USFS)------------	6/1-10/20	439	2050
Total---------------------		586	2535

Much of the area grazed is included in the lease area, and about 1 percent will be covered by the mine portal facilities and access roads.

A few juniper may be used for fenceposts or firewood. Some pinyon nuts may be picked, and some Christmas trees may be harvested.

3. SOCIOECONOMICS

The proposed mine is in an area where the current population is about 5,000. Economies of small communities in this region are largely based on agriculture, light manufacturing, coal mining, and transportation. A high degree of lifestyle similarity, community and family stability is characteristic of these communities.

4. TRANSPORTATION AND UTILITIES

Interstate highway 70 is a major transcontinental route. Locally it joins Green River and Salina Utah, both of which are rail heads. I-70 west of Fremont Junction in 1975 carried 1,740 vehicles per day, of which 285 were heavy trucks. The distance via I-70 from Fremont Junction to Salina and the D. & R. G. W. R. is 35 miles. I-70 east of Fremont Junction carried 1,290 vehicles per day, of which 170 were heavy trucks (UDOT, 1976). The distance from Fremont Junction to Green River and the D. & R. G. W. R. is 73 miles.

U-10 joins I-70 east of Fremont Junction and is the main route through several small communities in Emery County to Price, Utah, the present urban center of mining activity. U-10 is a major access road leading to northward 69 miles to Price and junctions with US 6 and the Denver and Rio Grande Western Railroad (D. & R. G. W. R.) It is a two-lane highway carrying 450 vehicles per day, including 110 heavy trucks, at Fremont Junction (UDOT, 1976).

The proposed mine is 9.4 miles south of Fremont Junction on U-72, a narrow graveled road--in places single lane with turnouts. U-72 provides access to private, State and Federal forest lands between Fremont Junction (I-70) to the north and U-24 near Fremont to the south. At the north end near Fremont Junction, it carried 45 vechicles per day in 1975 (UDOT, 1976). About 10 miles south of Fremont Junction it carried an av vehicles per day in 1975 (written commun. USFS, 1975).

Electric power has been (1978) established as far southward as Fremont Junction and other powerline routes are proposed for the general vicinity.

5. RECREATION

No recreation facilities or services are developed within or adjacent to the proposed minesite. Recreation use is dispersed and is based on the undeveloped character of the area. Activities and use include: a) driving for pleasure and viewing scenery, b) hunting elk and deer in season and some small game and game birds, c) camping and picnicking at undeveloped sites, d) gathering forest products, and e) rock-hounding and searching for artifacts.

Hunting elk and deer during the fall is the heaviest use of the general area for recreation. Other recreation use is light.

6. ARCHEOLOGIC AND HISTORIC VALUES

An intensive survey of all areas to be impacted was completed by Archeological-Environmental Research Corp., (1978). This survey and other preliminary investigations in parts of the project area revealed several archeology sites that may be affected by the proposed road and reservoir (Wikle, 1977; Gillio, 1975). The National Register of Historic places does not list any cultural sites for the area.

7. ESTHETICS

The area involved in the mine proposal is free of man-made modifications, except for highway U-72, a few secondary primitive roads, and an occasional fence. The area has an unmodified, natural appeal. The opportunity exists to view the natural environment in detail, on site, or as a panorama in combination with adjacent lands in all distance zones (foreground, middleground, and background).

Areas seen in the foreground and middleground have some variety but are considered to have only moderate or low scenic quality. If viewed from Hogan Pass, the panoramic scene includes the desert floor to the east as background and the lease becomes part of an outstanding landscape, with exceptional scenic qualities.

Most surface activity and some faclities, including the upgrading of U-72 and the proposed reservoir, would appear within a few hundred feet to 3 miles (foreground and near middleground) as viewed from U-72. Some facilities and activities would be in seldom seen or unseen areas. Visitor sensitivity to or concern about modification of the natural environment in this area would be above average, especially if modifications are prominent, extensive, or highly visible.

The optimum visual management objective would retain the natural landscape of areas seen from foreground viewing areas or from designated lookouts. Modification is acceptable, if done in a manner complimentary to or subordinate to the present landscape character.

C. FUTURE ENVIRONMENT

The BLM and USFS land use plans orient management of these lands to the production of forage for livestock and wildlife, watershed, and incidental recreation use. Without the mine little if any development would occur in the area and the environment would remain about the same.

CHAPTER III: ENVIRONMENTAL IMPACTS

A. NATURAL ENVIRONMENT

1. LAND

a. Topography and Geology

Construction, development, and mining at mine No. 1 would slightly alter the topography, dominantly at the facilities site (table 1) and along U-72.

Large-scale upgrading and relocating U-72 (not part of this proposal) could reactivate landslide deposits.

Freshly disturbed shale and mudstone and, particularly, swelling clay, within the Blue Gate Shale Member and perhaps also the Masuk Member of the Mancos Shale, may slump and flow during upgrading and relocating of U-72. Severe cut and foundation problems could result. If steep to moderate cuts, formed during portal-terrace construction should disturb the lowermost part of the Blue Gate Member, lesser but similar impacts could result. Much of the alluvium in flats and along streams is derived from mudstone and shale eroded from the Blue Gate Member. Therefore, where disturbed, the alluvium would be expected to react similarly, albeit to a lesser extent.

Impacts to paleontological resources would consist of losses of plant, invertebrate, and vertebrate fossil materials for scientific research, public education (interpretative programs), and to other values. Losses would result from destruction, disturbance or removal of fossil materials as a result of coal mining activities, and unauthorized collection, and vandalism. The extent of impact cannot be assessed because of lack of data.

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.

Because of the present 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.

Mining would very likely result in subsidence over an area perhaps as large as the approximate 1,800 acres of the mine workings. Possible effects are described in part 1, chapter IV. The combined thickness of the D and E beds probably reaches a maximum of 17 feet northeast of Paradise Valley Lake, near the southeast corner of the mine area. In this restricted area, with full extraction (exclusive of barrier pillars left near the Paradise fault), maximum vertical subsidence could locally reach 12 feet. Subsidence would be considerably less elsewhere; generally it would be barely discernible.

Construction near the portal and access road and mining too near cliff faces could result in new or reactivated landslides, rock slides, and rockfalls along the cliffs. The potential is increased where dips are steep (not uncommon from Last Chance Creek southward) and where the cliff-forming sandstones are heavily jointed.

b. Minerals

Total coal reserves at mine No. 1, is estimated at 21,000,000 tons. About 50 percent of this coal is minable, under current mining procedures. About 10,500,00 tons or as much as 12,175,000 tons (at 42 percent recovery) would remain in the ground and would not be recoverable under present technology.

c. Soils

Soils would be disturbed on about 77 acres by constructing mining facilities, transportation and utility systems, and the proposed reservoir. Soils productivity would be lost on this acreage for the life of the project but would be returned to near present status after reclamation. Some soil would be lost by wind and water erosion, especially during construction, along the haul road and utility lines and at the facilities site.

2. WATER

A total of 95 acre-feet of water per year would be required, 25 for mining, and 70 for dust suppression on roads. The domestic needs of the population associated with the total work force, wherever located, would be as much as 190 acre-feet per year, of which it is estimated that 50 percent would be consumptively used and the remainder discharged as sewage effluent.

The proposed reservoir could provide water for wildlife and livestock and help retard erosion downstream in Last Chance Creek (fig. 4).

Impacts from the proposed reservoir include: interruption of rights of downstream users, seepage of water into the Ferron Sandstone Member, and evaporation of ponded water. Estimated evaporation would be 44 inches, or as much as 51 acre-feet per year.

Subsidence and subsequent cracking of earth material may cause more runoff to infiltrate, but the increase cannot be predicted. Maximum possible increased infiltration would be 150 acre-feet per year (total estimated runoff) but actual increase would be much less, and perhaps

Figure 4.--Photograph looking west at the proposed reservoir site on Last Chance Creek, Mountain States No. 1 mine. The earthen dam will be built where the road is near the channel, lower center of the picture. Water would back up to just below State Road 72 in the upper right-hand corner of the picture.

zero. Infiltration would eventually be discharged, but potential discharge points cannot be predicted from available data.

Subsidence would probably affect any water-saturated beds overlying the mined area. Water could drain through subsidence fractures, thereby increasing ground-water recharge. Infiltrating water might increase in dissolved-solids concentration.

The mine would be supplied from the proposed reservoir nd possibly from wells west of Paradise Fault. The water demand for mine No. 1 is relatively small but might diminish the flow of springs near the well field.

3. AIR

Assuming the haul road and U-72 are not paved, the estimated maximum 24-hour concentration of TSP for the estimated daily one way passes of 145 autos and 180 trucks, is as high as 110 $\mu g/m^3$ above background levels within 110 yards (100 meters) of the road. A 50 percent reduction in fugitive dust emissions because of watering was assumed in calculating the 62 $\mu g/m^3$ value. The predicted maximum TSP is below the federal secondary NAAQS standard of 150 $\mu g/m^3$ (which may not apply in this case).

Total annual potential emissions from the mine (coal storage and transfer) and fugitive dust from truck haul on unpaved roads would be an estimated 2,070 tons (20 tons from mining activities and 2,050 from truck haul on unpaved U-70).

Visibility would be significantly impaired in the immediate vicinity of U-72 from dust associated with truck haul and auto travel to and from the mine. Further, Capitol Reef National Park, a mandatory class I area is 9 miles south-southeast of the proposed Mountain States Resources mine. It is possible that emissions from the mine could impact visibility at Capitol Reef. EPA is required to develop regulations regarding visibility in mandatory class I areas by August 1979. Until the regulations are promulgated, the significance of any visibility impairment in Capitol Reef National Park cannot be determined.

4. VEGETATION

Main impacts to vegetation will result from portal facilities, access road, and reservoir which would destroy about 77 acres covered by the Pinyon-Juniper Woodland and Sagebrush-Grass types. Little impact on vegetation overlying underground workings is forseen. Impact on water resources would have little or no effect upon vegetation.

The two proposed endangered plants, Townsendia aprica and astragalus and the proposed threatened species Castilleja scrabrida may be impacted by the mine. Townsendia aprica is particularly susceptible.

5. WILDLIFE AND FISHERIES

Wildlife habitat would be degraded by soil disturbance and (or) vegetation removal in facilities construction, and, because of noise, lights, activity and traffic associated with construction and mining, wildlife would avoid the area to various degrees. Destructive effects can be measured and quantified for some species, but avoidance cannot be accurately quantified.

An indirect impact would result from improved access into the Last Chance Creek-Paradise Lake vicinity. More visitors and casual traffic would further disturb the more sensitive species, such as elk, cougar, bear, and deer. The magnitude of these offsite, indirect impacts is not predictable.

Wildlife habitat would be altered on 77 acres (table 1). The altered habitat is in winter deer range, critical during severe winters when even all of the normal winter range is insufficient. Small game and nongame mammals, birds and reptiles would also be somewhat reduced in numbers by the change. Their diminution would, in turn, affect their bird and mammal predators. No base data are available to predict the impact to small game and nongame mammals and birds or predatory birds and mammals.

Because of mining activity, deer would be expected to avoid about 1,380 acres of winter range in a zone surrounding the proposed mine and along improved U-72 at full capacity. This zone would extend outward 0.1 mile from the periphery of the disturbance centers at the mine portal, rock waste area, access roads, and U-72. In the zone, deer feeding and other wildlife uses would be expected to be 50 percent less than in other parts of the winter range. Avoidance would be expected to be total at disturbance sources and to decrease outward with distance.

Alteration of habitat surrounding the facilities area would reduce the deer population potential by two, and avoidance would reduce potential by another 45.

Loss of the potential to support 47 deer would be accompanied by a potential annual loss of 25 fawns. The fawn loss is based on data collected for deer unit 45 in 1967-76. The herd averaged 30 percent bucks and 70 percent does (42 bucks:100 does) and the annual fawn production was 78 fawns per 100 does (Utah DOWR, 1977).

Thirty-five acres of year-round elk range would be destroyed by constructing the mine portal, access roads, reservoir, and rock-waste area. Elk use would decrease on possibly another 3,700 acres of year-round range and 327 acres of winter range because of mine and traffic disturbance and from an expected increase in other habitat encroachment. Elks avoidance may extend a mile from large disturbance sources, such as mining operations based on elk reaction to the South Pass Iron Mine in Wyoming (oral commun., M. Hockley, Dist. Biologist, Wyoming Game & Fish Commission, 1977). Studies of elk reaction to lesser disturbance indicated that elk would graze within 300 yards of forest roads, but preferred at least half a mile distance from campers, fishermen, picnickers, or timber cutters (Ward, 1973; Winn, 1976).

The reduction of winter deer use and the intrusion of coal-mine operations would probably reduce the cougar population potential in unit 45 by one male and one female. Their sensitivity toward disturbance and a reduced food supply would probably contribute most to abandoning their home area.

Black bears would avoid the mine portal area and U-72; however, reduction of their overall population in unit 45 is uncertain.

Collisions between wildlife and vehicles would rise because of increased traffic and the probable upgrading of U-72 between I-70 and the proposed mine. An annual average of 13.6 deer per year were killed on the roads in unit 45 during 1971-76 (Utah DOWR, 1977) where only 30 miles of high speed roads accounted for most of the roadkills. Cottontails and many small nongame mammals would become roadkill victims, as would scavenging birds and mammals because of increased traffic.

If a powerline is built, raptors may be shot because they are tempting targets when they use poles for feeding and roosting perches. Evidence indicates that the closer powerlines are to roads, the greater the risks of raptors being shot (Ellis and others, 1969). New powerlines, of course, would present new strike hazards to all birds.

The space for housing and increased domestic water use might reduce present wildlife and fish habitat.

Demand for game and fish in the vicinity would increase because of the increased population. Encroachment of the population upon wildlife habitat while seeking outdoor recreation would increase wildlife harassment. An increase in illegal hunting and fishing would be expected.

B. CULTURAL ENVIRONMENT AND LAND USE

1. LANDS

Deterioration of roadless and wilderness characteristics from coal transportation, increased human intrusion, and construction and maintenance activities along U-72 and at the minesite would be expected.

2. RANGE AND TIMBER

The vegetation destroyed by implementing the proposal would affect less than 1 percent of the usable grazing area. The access road should have only a minor impact on cattle operations.

A small volume of woodland products, such as fenceposts, firewood, Christmas trees, and pinyon nuts, would be lost.

3. SOCIOECONOMICS

The proposed mine would add about 900 new area residents to the 1990 population or about 5 percent of the projected level population discused in part 1.

Major anticipated components of the new residents are:

Married employees and their families----	441
Single employees------------------------	29
Secondary business and industry employees and their families----------	331
Single secondary business and industry employees--------------------	87
Total new population--------------------	888

Greatest impact would result from increased urbanization and housing demands in the towns of Emery County and in Salina Sevier County. Following present trends, most of the new residents would probably live in trailer homes, and trailer-home sites might conceivably develop anywhere in Emery County. The second major impact would be increases in community (including school) costs to pay for constructing, operating, and maintaining community and county services.

Developing the mine could be of benefit to many area residents presently unemployed or underemployed. The higher personal incomes, of mine employees and the increased total regional personal income, would expand the economy of Emery County and the Salina area of Sevier County. (Regional effect of increased mining activity including this mine is discussed in part 1, chapter IV, Socioeconomics).

4. TRANSPORTATION AND UTILITIES

Environmental impacts will result from constructing 0.57 mile of access road and loops within the lease area and upgrading 9.4 miles with some relocation of U-72 to carry coal truck and commuter traffic.

U-72 would be required to carry about eight times more traffic between the mine haulage road and Fremont Junction, from 45 vehicles per day to 365, including 180 heavy trucks (6 wheels or over). In full production, a coal truck would pass along U-72 every 6 to 7 minutes, on the average, over a two-shift working day; consequently, unless the highway is paved dust is likely to be a problem. As precipitation is only about 12 inches per year, keeping U-72 adequately watered would require 70 acre-feet of water per year (about 7.7 acre-feet per mile per year).

5. ARCHEOLOGIC AND HISTORIC VALUES

Archeologic investigations indicate an adverse impact on several sites by the planned road and reservoir. Increased population due to mining may result in more vandalism of cultural resources in the region.

6. RECREATION AND ESTHETICS

Improving U-72 would increase traffic and would increase recreation use of the area. Environmental impacts would include increased littering and vandalism, reduced hunter success, and a change in the natural remote and unoccupied character of the landscape. Archeologic or historical sites not adequately protected or removed could be destroyed or pilfered.

The most significant impact would be from mining, support facilities, and activities, where none now exist. Mining north of I-70 is commonplace, but mining south of I-70 along the Fremont road (U-72) is nonexistent (fig. 1; part 1, fig. I-2). Mining in this area would concern most recreation users.

Dust, noise, construction, and mining activities, would alter the natural landscape. Although mine No. 1 would be in a primarily unseen area, some facilities and activities may be prominent enough for visual impacts from U-72 or Hogan Pass. The extent of impact on the esthetic resource would depend on the scale of development and activities at any one time.

Safety hazards would also be created along U-72 and I-70 by mixing mining and recreation traffic, if controls are not adequate.

CHAPTER IV: MITIGATING MEASURES

Legally enforcable mitigating measures are given in chapter I-D.

Other mitigations are included, along with project alternatives, in chapter VIII. General mitigation measures are described in part 1, chapter III.

CHAPTER V: ADVERSE EFFECTS THAT CANNOT BE AVOIDED

A. NATURAL ENVIRONMENT

Although mitigation calls for reclamation to generally conform with preproject topography, exact duplication would be impossible. Major excavations, waste-disposal sites, and parts of some structures would remain permanently.

Subsidence, with attending fracturing and surface bulging, even though slight, would remain after mining. Landslides (principally as rock slides and debris slides) and rockfalls along canyon rims would be increased by subsidence. They would perhaps also increase on cut slopes owing to construction of surface facilities and roads.

Because of technologic limitation of underground mining and for safety, 10.5 to 12 million tons of coal would probably be left in the ground and very likely lost to future recovery.

Soils would be disturbed on about 35 acres, resulting in physical and chemical alteration. Erosion of exposed soils would accelerate, especially during construction.

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.

Subsidence will fracture overburden and may increase ground-water recharge. However, the chemical quality of recharge water may deteriorate as it seeps through the mine workings. Water levels and spring-flow might decline dependent on the amount of ground-water withdrawal west of the Paradise fault. The total annual water requirements associated with all facets of the mine could reach 285 acre-feet per year, including 25 acre-feet per year at the mine, as much as 190 acre-feet per year for domestic needs elsewhere and possibly 70 acre-feet per year for watering unpaved road U-72.

Assuming paving or chemical stabilization would reduce fugitive dust emissions from unpaved roads by an additional 70 percent over watering alone, the 24-hour maximum incremental increase in TSP would be approximately 33 $\mu g/m^3$, which is below the secondary NAAQS standard. Visibility would be somewhat impaired near U-72.

Individual specimens of the plant _Townsendia aprica_, proposed for the endangered plant species list, could be inadvertently destroyed by offsite activities near the mine. The potential loss cannot be quantified and the presence of the mine would not necessarily increase the probablity of loss.

About 1 percent of the grazing area and perhaps 3 AUM's per year would be lost for the life of the mine. Normal grazing patterns of cattle would be somewhat disrupted. Some fenceposts and firewood would be salvaged before construction, but they would not be replaced (regrown) until some years after mining ceases.

Wildlife habitat would deteriorate because of destruction and disturbance. Vehicle-wildlife and bird-powerline collisions would increase. These impacts would reduce wildlife numbers and potential habitat to support them.

If additional water is required for domestic use and it is taken from a fish habitat supply, then degradation of fish habitat would occur and cannot be avoided.

B. CULTURAL ENVIRONMENT AND LAND USE

Remaining major adverse impacts are associated with lifestyle and subculture and are not typically mitigated by monetary assistance for local constructing, operating, and maintaining public services. A major impact would be developing more cosmopolitan community lifestyles. These would differ from the present-day characteristic rural, family oriented, and religious lifestyles.

Unavoidable environmental impacts would result from constructing access roads and loops and a powerline to the mine, and reconstructing and realining 9.4 miles of U-72.

Traffic on the north end of U-72 would increase more than eight times. Traffic through the Fremont Junction interchange on I-70 would increase about 20 percent.

Unless the northern leg of U-72 were upgraded and paved, which is a responsibility of the State, impacts on nearby vegetation and air quality would accrue from blowing dust, and hazard to traffic from dust and the narrow, crooked road would be considerable

Solitude and the unoccupied appeal of the area would be lost during the life of the mine and until reclamation was completed. Some dispersed recreation uses would increase, but along with littering and vandalism. The mine plantsite would be unavailable for recreation during the life of the mine. Some loss in hunter success could be expected because of increased hunting pressures and mining activities.

Increased traffic on I-70, U-10, and U-72 could create hazards and adverse impacts for all users.

Developments and activities, if seen from U-72 or Hogan Pass overlook, cannot be mitigated to any great extent and would appear as industrial modifications of the natural landscape.

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.

CHAPTER VI: SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The area has been used for coal mining in the past and is suitable for mining. Other than implying an increase in coal production and regional population, implementation of this mine plan would not create a significant change.

Short-term disturbance caused by construction would be largely obliterated in the long term. The impact of subsidence above the mine would probably continue for perhaps 3 to 5 years after the mine is closed, but is not expected to be a problem after that.

Development of the mine would supply bituminous coal for generating electricity and (or) other uses for 22 years. The use commits 21 million tons of coal, 10.5 million or less mined, the rest left in place.

Mining at mine No. 1 will not affect the long-term coal productivity of the leasehold. The 70 million tons of coal estimated to be in the A bed beneath mine No. 1 and the A, D, and E bed coal northwest, east, and south of the proposed mine No. 1 area, can all be mined at some later date.

Implementation of the mine proposal would impact an undetermined number of uninventoried exposed and unexposed fossil localities and result in an unknown gain in knowledge of paleontological resources because of exposure which might never have occurred without excavation.

Disturbed soils would be taken out of vegetative production during the short term. Soil productivity would be lost on about 77 acres but most of this loss could be regained following mining. Some sites suitable for seeding would be revegetated shortly after disturbance, so they would be out of production only for a short time. Some loss of the plant <u>Townsendia aprica</u> might occur, but such loss might occur anywhere.

Reductions in runoff from watersheds overlying the mine could be long term, dependent on the degree of fracturing and the length of time the fractures remain open, and could be as much as 150 acre-feet per year.

Long-term effects upon ground water would be generally beneficial. Recharge could increase; the consequent reduction in the amount of available surface water would probably be compensated by reduced evaporation. The water table would recover from pumping in the long term. Ground water in the vicinity of the mine, however, might increase in dissolved-solids concentration.

The reservoir on Last Chance Creek, if constructed, could provide water for wildlife and livestock over the long term.

In the short term, range, forage, and woodland products would be lost. In the long term, after reclamation, the area should be as productive as it is now.

Decreased wildlife population potential from mining and human encroachment would be short term.

New and improved access routes would remain. Human encroachment, therefore, would remain, depressing wildlife productivity over the long term.

Community and county tax base and family incomes would increase during mining. Rural economic programs would decrease, especially the number employed full time in agriculture.

When the mine closes or suffers a setback near by communities could conceivably suffer economically.

About 10 miles, and perhaps more, of improved U-72 would remain after mining, to some degree facilitating access to Paradise Valley and other developed areas along U-72 to the south. Recreation use could, thus, increase but recreation use is not expected to exceed proposed mine traffic unless the area is further developed.

The proposed action would significantly alter or reduce the opportunity for solitude and dispersed or undeveloped recreation opportunities on a short-term basis. Some easily accomodated increase over present recreation use would accrue on a long-term basis as a result of improved access. New or different types of recreation would not be expected as a result of the project.

Short-term archeologic effects would include eliminating, through survey collection and possible project activity, of in-place cultural resources. Negative long-term effects are the likely increased illegal artifact-collecting in the vicinity. Positive long-term effects could result through collection, which would insure salvaging material that would otherwise be undiscovered, destroyed by natural forces, or illegally collected.

Any archeological sites disturbed during development of the site would result in a long-term impact to the inplace value of that site. Collection of sites that might be found will insure recording information that could otherwise be lost to natural forces or vandalism.

Short-term use of the area for mining could significantly modify and impact the natural visual character until reclamation is completed. U-72, perhaps some interior service roads, and some mining residues, would remain after mining and reclamation. Except for U-72, other evidence of mining would be in unseen or seldom seen areas, and the esthetic resource, as seen from U-72 or Hogan Pass, would be similar to the natural landscape of the present.

CHAPTER VII: IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Subsidence would irreversibly change the topography above the mine.

The 10.5 to 12 million tons of unmined coal left in the mine is an irretrievable commitment of the coal resource.

Machinery, gravel, and other material used for construction would be mainly an irretrievable commitment; all fuels consumed during construction, mining, transportation, and reclamation would be irretrievable.

Impacts might occur to an undetermined number of uninventoried exposed and unexposed fossil localities.

The original natural soil conditions would not be attained after reclamation. Soil amendments and energy input needed to rebuild the soil to its approximate original condition would be irretrievable. Any soil eroded as a result of the project would be irretrievable.

The water that may be used for mining, dust suppression, and domestic needs would not be lost to the natural hydrologic cycle but would be irretrievable locally, except for about 95 acre-feet per year of sewage, which could be reclaimed. The saturated sandstone in the west block of the Paradise Fault, if pumped, would recover after the mine closes. The termination of coal mining operations would lead to a termination of pollutant emissions. Thus the air resource would not be irreversibly committed as a result of the mine operation. Emissions from secondary growth and related activity such as traffic, urban fuel consumption, etc., induced by the proposed action would be more permanent in nature and result in a long-term commitment of the air resource to some deteroration.

The vegetation and associated range, forage, and woodland products cleared for the mine facilities would be irretrievably lost. Proper reclamation of the disturbed areas would prevent any irreversible commitment of vegetative resources.

Wildlife lost, including individuals and their progeny and wildlife habitat potential affected, would be irretrievable. Wildlife habitat destroyed or altered owing to improved access into the general area and remining beyond the life of the mine would be irreversible.

Labor and materials used in constructing and upgrading roads would be irretrievable, as would the commitment of vehicles, fuel, and supplies in hauling coal and by commuting miners. Accurate quantification of materials needed for transport of supplies or workers is not possible. However, assuming that the coal-haul and commuting distance are both about 50 miles, over 22 years of production, both light and heavy vehicles would travel a total of nearly 15,000 miles per day, 81 million miles over 22 years, consuming 12.5 million gallons of fuel.

The area would be irreversibly committed to some increase in recreation use if U-72 remained as a high standard road after mining and reclamation. Any evidence of mining after reclamation would irretrievably modify the natural landscape.

The cultural resources in the immediate project area could not be preserved in place.

CHAPTER VIII: ALTERNATIVES

General administrative options available to the Secretary of Interior are discussed in the regional EIS, part 1, chapter VIII. Detailed administrative alternatives are listed below.

A. NO ACTION

Pursuant to implied covenants of both the Federal mineral leasing laws and the existing lease agreements, the Secretary is obligated to respond to a legitimate application to conduct mining operations on a valid lease, provided that all terms and conditions thereunder have been met. His response may be approval as proposed, rejection on various legitimate grounds, approval in part and rejection in part, or approval subject to such additional conditions and requirements or modifications as he may impose under the laws. He may also defer decision, based on proper grounds, as described elsewhere in this chapter.

"No action" on proposals for continuation of approved ongoing mining operations would equate to closing down existing operations; under existing regulations, operations may not proceed in the absence of approved mining plans and related permits. The impacts of taking no actions in such cases would be approximately the same as those described under the following subsection C (2), "Cancel the lease."

"No action" on mining proposals for the initial development of existing lease would equate to maintaining the status quo on that lease. The impacts of taking no action in these cases would be the same as described subsequently under subsection C, "Prevent further development on the existing lease."

The coal would not be mined and the proposed production to meet coal demand would be produced from somewhere else. The impacts discussed in earlier chapters would not occur.

B. DEFER ACTION

For proper cause, the Secretary may defer final action on a proposed mining and reclamation plan. These could include, but are not limited to, the need and time required for:

1. Modification of the proposal to correct administrative or technologic deficiencies.

2. Redesign to reduce or avoid environmental impact.

3. Acquisitions of additional data to provide an improved basis for technical or environmental evaluation.

4. Further evaluation of the proposal and (or) alternatives.

The principal effect of deferring action on a proposed mining and reclamation plan on these grounds would be a comparatively short-term delay in the imposition of all related impacts of the proposal as previously described in the unavoidable adverse impacts section of this statement.

Once a mining and reclamation plan is approved, the regulations and lease terms require that all subsequently proposed departures and deviations therefrom be approved in advance by the USGS. The regulations (30 CFR 211) also permit the USGS to direct that changes be made in previously approved operations. For example, changes could be ordered to accommodate new, improved, or revised administrative requirements, technologic improvements, environmental concerns or requirements, or revisions of prior evaluations thereof in the light of experience or previously unknown factors.

Mining would be deferred to some later date. Impacts on the environment would be essentiallyunchanged, but would be deferred. A deferral until underground mining technology is improved might result in greater extraction.

C. PREVENT FURTHER DEVELOPMENT ON THE EXISTING LEASE

The only alternatives to allowing development of the existing lease is to prevent such development or to impose additional conditions and restrictions on the operations. The several apparent means of preventing full development are discussed below.

If prevention of further development of the existing lease 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, other comparable quantities of coal or sources of energy would be required to meet national needs. The development of other sources and related impacts is discussed later.

1. SUSPEND OPERATIONS

The full development of the existing lease 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, and future suspensions of operations for reasonable periods, with proper grounds, could be imposed. The Secretary cannot, under present circumstances, suspend operations to the extent that a de facto 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 operations pending legislation remains available. Impacts of this alternative would be similar to those described in subsection C (2), "Cancel the lease."

2. CANCEL THE LEASE (NO NEW DEVELOPMENT)

The Secretary does not possess authority to unilaterally cancel the lease except on the ground defined therein (section 7 or 8 of the lease terms--"Proceedings in case of default"). The authority to cancel on other grounds would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees as may be necessary. The Administration has not entered a request for such legislation, and the Congress has not initiated such action in 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 non-environmental concerns.

Present production could be interrupted temporarily or terminated completely, as could further development of the existing lease.

To the extent that coal production from the existing lease was curtailed or halted, alternative sources of energy would be required to meet present needs and demands. These could be foreign and (or) domestic and are discussed in later pages. The time required to replace the resource foregone could range from scant to a number of years, depending on the specific alternative(s) selected and its state of production.

Environmental impacts of the proposals could range widely, depending on the administrative action taken on the existing lease. If this lease were cancelled through Congressional authorization, proposed mines would be avoided. Conversely, should development eventually be authorized, environmental impacts as discussed in the impact chapter would occur. The net result would be a deferral and perhaps reduction of impacts through changed technology or requirements imposed at that time.

3. FEDERAL ACQUISITION OF THE LEASE

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 lease as previously discussed under subsection C (2).

4. REJECT THE MINING AND RECLAMATION PLANS

Rejection of the proposed mining and reclamation plans would result in no environmental impact on the leased lands, and they would continue in their present condition, subject to modification by natural process and by the condition of other existing activity and uses--and to further modification by the surface owner to meet other uses.

The Secretary may reject any individual proposed activity 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 designed courSe of action by the lessee (operator). 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 Congress. Viability of this option is dependent upon timely legislative action; the option of rejecting the proposed plans pending legislation remains available. Impacts of this alternative would be similar to those described under subsection C (2), "Cancel the lease."

D. RESTRICT DEVELOPMENT ON THE EXISTING LEASE

The subject lease conveys the right to develop, produce, and market the Federal coal resource thereof if all other terms and conditions have been met by the lessee. In general, the Secretary does not possess the authority to arbitrarily constrict development. 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.

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.

E. APPROVE THE MINING PLAN AFTER MODIFICATION

A number of the impacts identified and described in chapter III of this statement could be more fully mitigated by the selective application of those measures described that are supplemental to the proposals of Mountain States Resources Corporation or by implementation of one or more of the alternatives described below. In addition, special conditions could be added to the approved plans relating to the secondary effects of the mining. Such conditions must be reasonable and, if unacceptable to the lessee, could result in the lessee not developing the lease areas with the resultant impacts previously discussed under subsection C (4) "Reject the mining and reclamation plans."

F. ALLOW DEVELOPMENT OF SELECTED AREAS NOW UNDER LEASE

This alternative would permit only selective exploration and development on existing leaseholds, based on anticipated adverse environmental consequences. The decisionmaker has the authority and responsibility to evaluate the coal resources and impacts of mining on this lease prior to acting on the proposals. Exploration and development could be allowed only on these leaseholds, or portions thereof, that would have the lowest anticipated adverse environmental consequences. Weighing the tradeoffs of mining or precluding mining on selected tracts is part of the evaluation and decision process. Adoption of this alternative would reduce adverse effects by reducing the area in which the impacting activities could take place.

The alternative of allowing the development of only selected areas already under lease constitutes a selective application of the above. Absent a showing lease-by-lease or plan-by-plan of the likelihood of totally unacceptable environmental impacts that could not be reduced to an acceptable level, the Secretary does not possess the authority to otherwise constrain development of the leasehold if all other requirements of the lease have been met. In addition, application of this alternative would not permit maximum recovery of the coal resources and would then 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.

G. COMPANY-PROPOSED ALTERNATIVES

1. ALTERNATE ACCESS ROAD TO PORTAL

a. Description of the Alternative

The proposed access road to mine No. 1, which heads up the west and south sides of a steep-walled canyon (fig. 2) may be relocated to the east and north sides, to take advantage of the generally gentler slopes on those sides. The junction with U-72 and the crossing of Last Chance Creek would probably be unchanged. The canyon that heads towards the portal site would be crossed at some undetermined location between U-72 and the portal. For the last few hundred feet closest to the portal, the road would follow the loop to the proposed mine-waste disposal site (fig. 2). Total length of the alternative and area of surface disturbance would be similar to those for the proposed road.

b. Topography and Geology

Topographic relief is somewhat more subdued along the alternate route. Rock types in the Ferron Sandstone Member of the Mancos Shale are the same as those across the canyon, but are more weathered and seem to be less stable, particularly the mudstones and shales. Gypsum crystals are commonly strewn about on weathered shale slopes near the outcrop of the E bed. Unfavorable road foundation conditions could be expected along part of the alternate route.

Less cuts would probably be needed in constructing the alternate road. However, more filling and shoring may be required, adding to total surface disturbance. Small landslides may be more frequent; rockfalls and rock slides may be less frequent.

Mitigating measures would be the same, and unavoidable adverse effects would be similar to those for the proposed road. On termination of mining, the road would be reclaimed.

c. Soils

Soils along this route are less stony and more clayey than along the proposed route. Soils formed from shale and mudstone are common. These materials are highly erodible and would make a poor road base. More detailed information would be necessary to evaluate the extent of various soils along this route.

d. Others

Other impacts would not be significantly changed by this alternative.

2. ALTERNATE SURFACE FACILITIES SITE

a. Description of the Alternative

Some of the surface facilities proposed for the steep slopes near the portal, where space would be at a premium and where much blasting and scraping would be required, could be moved northwest, closer to U-72. This area, south of and above Last Chance Creek and the proposed reservoir, is less rugged and more open. The facilities site would adjoin either the proposed access road or the alternate road. It would probably lie entirely within land administered by BLM.

Even if the alternate site is adopted, some facilities at the mine mouth would still be needed. Terraces at and below the portal would still be required, though they could be smaller and thus require less cutting and filling. Distributing facilities between the proposed and alternate sites would result in disturbing a somewhat greater total area.

Facilities constructed upon the alternate site would be partly to wholly visible from U-72.

Artifacts are present at and near the alternate site.

b. Topography and Geology

Median elevation of the alternate site would be 7,380 feet; relief would probably not exceed 60 eet. Bedrock consists of the Ferron Sandstone Member of the Mancos Shale, possibly locally lapped upon by alluvium of Last Chance Creek.

Construction at the alternate site could increase erosion and sedimentation in Last Chance Creek. Sediment, however, could be trapped in settling basins before reaching the creek.

Surface disturbance would be unavoidable at both the proposed and alternate sites. Upon termination of mining at mine No. 1 the alternate site would be dismantled and reclaimed, except for certain facilities that might be required for operations at proposed mine No. 6.

c. Soils

The alternative site takes soils out of production that are more productive than those at the primary proposed facilities site. However, reclamation would be easier on the gentler slopes.

d. Others

Other impacts are either not quantifiable or the change is insignificant from the primary proposal. The site would be unacceptable if potential archeologic values are determined on survey to be significant enough to require preservation in place.

3. TRUCK HAUL TO OTHER RAILHEADS

a. Description of the Alternative

The proposal does not provide specific railheads to which coal would be delivered, although Salina, on the Denver and Rio Grande Western Railroad, seems to be preferred. Also mentioned are truck haulage to the Union Pacific Railroad at Levan, to the Denver and Rio Grande Western at Green River, and to a preliminarily proposed Castle Valley Railroad (part 1, fig. I-2) at some undetermined coal-loadout station probably 4 or 5 miles south of Emery. Truck haulage to the Denver and Rio Grande Western at Price is considered here, as a basis for comparison and as a possible alternative (table 3). Actual coal haulage would probably be to several, if not all, of these, depending upon markets.

Table 3.--Truck haul route analysis based on 0.5 million tons of coal per year for 22 years

Destination	Salina	Levan	Castle Valley	Price	Green River
One-way distance, miles--	45	92	18	79	83
Working day, hours-------	18	16	16	16	16
Truckloads per day-------	77	77	77	77	77
Miles per day------------	6,900	14,200	2,800	12,200	12,800
Total miles x 10^6 (22 years)--------------	39.6	81.0	15.8	69.5	73.0
Million gallons of fuel, 22 years----------------	9.9	20.2	4.0	17.3	18.3
One-way truck passages per day (veh./day)------	154	154	154	154	154
Minutes between trucks---	9.4	9.4	9.4	9.4	9.4
Round-trip travel time, hours------------------	3.25	5.6	1.9	5.0	5.1
Round trips per truck per day-----------------	4	2	8	3	3
Trucks needed at any one time----------------	20	37	10	26	26

Several features would be common to all alternatives. The 10-mile haul from the mine to Fremont Junction is common to all, as would be resulting environmental effects. The types of effects on the environment would be the same; magnitudes would be greater or lesser, depending on haul distance. Truck haul to Price would be a little more hazardous because it would be along a two-lane highway already carrying considerable heavy truck traffic. The same is true for the two-lane road between Salina and Levan. The moderate increase in truck traffic would not strain the capacity of the two-lane roads, except in Price, where highways are already overloaded. A moderate increase in truck traffic through the steep Salina Canyon part of I-70 could begin to affect its carrying capacity but there would be little effect from the Mountain States Number 1 mine alone.

4. POWERLINE ROUTE, FIRST ALTERNATIVE

a. Description of the Alternative

The proposal does not specify a preferred power-transmission route, but mentions two possibilities.

One possible route would follow along and near U-72, from Utah Power and Light's projected substation near Fremont Junction 8.5 miles to a substation to be constructed near the mine portal. Expected surface disturbance would be 11 acres. Access for line construction would be from U-72. Like the adjoining stretch of U-72, the route would lie entirely within lands administered by BLM.

b. Topography and Geology

Topography and geology would, in general, be similar to those along nearby U-72. The route would lie upon parts of perhaps all four upper members of the Mancos Shale and locally also upon alluvium. It would probably cross the Paradise Fault in one or more places.

Impacts on the land surface, described in chapter III, of and on freshly disturbed shale and mudstone, swelling clay, and landslide deposits could occur along this route. Detailed geologic mapping and route surveying before construction could locate and thus attempt to avoid landslide deposits and zones rich in swelling clay. Care would have to be taken not to cause rockfalls and slides, to avoid making steep cuts in shale and mudstone units, and to avoid settling poles and facilities into swelling or compactible clay. If these precautions are taken, surface impacts would be minor.

Upon termination of mining at mine No. 1, the powerline, probably by then extended southward to other mines, would be expected to remain in use to serve other mines on the leaseholds.

c. Vegetation

Vegetative impacts would be minimal adjacent to U-72, and new access roads for constructing and maintaining the line would not be needed. The additional 11 acres of disturbance would not be significant either to vegetation or grazing.

d. Wildlife

Powerlines constructed according to established designs would prevent raptor electrocutions, but bird-powerline strikes would occur and be unavoidable. The powerline should be at least 300 yards from U-72 to reduce the exposure of perching raptors to indiscriminate shooting.

e. Transportation

Construction and land-occupied effects would be very little more than those resulting from upgrading U-72.

5. POWERLINE ROUTE, SECOND ALTERNATIVE

a. Description of the Alternative

Another possible power-transmission route would begin somewhere south of Emery and head southward and across I-70 to the Limestone Cliffs, then southwestward along and below the cliffs to Last Chance Creek, then northwestward along the canyon of the creek to the mine portal area. Although this route cannot be located at this time with any certainty, it would probably be 24 miles long. Using this figure, surface disturbance could be about 30 acres. Some low-standard roads east of the Limestone Cliffs could serve for partial access during line construction.

The habitat is largely desert. North of I-70 the route would lie on private land and on land administered by BLM; it may also cross some State land. South of I-70, it would lie mainly on BLM lands, but could also cross State land, National Forest lands are present only along part of the last leg of the route, near the portal.

b. Topography and Geology

The route would traverse a variety of topographic features. They include Castle Valley, a part of the Coal Cliffs, the Limestone Cliffs, and the desert east of the Limestone Cliffs.

From south of Emery to the base of the Coal Cliffs and on the leg within the canyon of Last Chance Creek, bedrock units would be mainly the Ferron Sandstone and Blue Gate Shale Members of the Mancos Shale. Elsewhere, the route would lie upon the Tununk Shale Member and upon the extensive pediment and other surficial deposits that cover much of the Tununk Member. The Tununk Member consists largely of deeply gullied poorly resistant mudstone and shale. It is difficult to drive on when wet, and it swells, slumps, and flows readily when disturbed by construction. Landslide deposits are extensive along the middle and lower slopes of much of the Limestone Cliffs. Natural rockfalls and rock slides take place within the canyon of Last Chance Creek, which is walled and largely floored by the Ferron Sandstone Member.

Perhaps 30 acres would be disturbed by construction, which would include access roads along part of the route. Steep to moderate artificial cuts in the Tununk Sale Member can be expected to fail. Landslide deposits could be reactivated if disturbed. If they cannot be bypassed, they would require considerable shoring and draining, which would result in additional surface disturbance. Construction within the canyon of Last Chance Creek could increase the frequency of hazardous rockfalls and rock slides. On the basis of protecting land-surface values, this route is much less attractive than the first alternative route.

Mitigating measures would be similar to those outlined for the first alternative route. As impacts are expected to be larger in scale, mitigation can be expected to be more difficult and costly. Some surface disturbance and some rockfalls and rock slides will result from construction and be unavoidable. Short- and long-term use would be the same as for the first altertnative route.

c. Vegetation

Vegetative impacts would increase in proportion to the additional area of surface disturbance caused by both the line itself and the access needed to construct it. The 30 acres of disturbance would not be significant to either vegetation or grazing.

H. OTHER ALTERNATIVES

1. CONVEYOR HAULAGE

Conveyor haulage would probably not be warranted for handling production from mine No. 1 alone. It would, however, seem environmentally and economically attractive at some future time, should other Mountain States mines go into simultaneous production.

I. MITIGATING MEASURES

Mitigating measures proposed by the company are given in chapter I-C and legally enforceable mitigating measures in chapter I-D.

Some other and more general measures are given in part 1, chapter III.

Other mitigating measures applicable to the proposed action and that could be implemented if feasible, include:

1. Vehicle-wildlife strikes may be reduced somewhat by eliminating an 8 to 10 foot-wide strip of vegetation on either side and immediately adjacent to roadways.

2. If fences along roadways become necessary, they should be constructed according to specifications to avoid deer and (or) elk entrapment.

3. If so requested by USGS, the company would cooperate in establishing a network of survey monuments, before mining. These monuments would be used to monitor subsidence during and after mining.

4. Before heavy use by trucks, U-72 would have to be widened and straightened between Fremont Junction and the lease, and perhaps locally relocated. U-72 should be paved between the mine access road and Fremont Junction for greater safety of its multiple users and to allay dust.

5. Utility and access rights-of-way would be grouped into single corridors and, where possible, utilities would be placed underground or within the road right-of-way, to reduce forage and forest-product loss and to reduce interference with other land uses.

6. If the powerline cannot be buried in the road profile, it would be placed at least 300 yards from the roadways to reduce indiscriminate shooting of perching raptors.

Socioeconomic impacts identified in chapter III may be mitigated to some degree by utilizing loans, grants, pre-paid sales taxes and planning measures described in part 1, chapter III.

CHAPTER IX: CONSULTATION AND COORDINATION WITH OTHERS

A. FEDERAL AGENCIES

Geological Survey, USDA Forest Service, Fish and Wildlife Service, Soil Conservation Service and National Weather Service.

B. UTAH STATE AGENCIES

Geological and Mineralogical Survey, Division of Water Resources, Division of Water Rights, Division of Health, State Engineer, State Climatologist, Division of Wildlife Resources, Division of State Lands, Division of Parks and Recreation, Department of Transportation, Outdoor Recreation Agency, and Institute for the Study of Outdoor Recreation and Tourism, Utah State University, Logan, Utah.

C. COUNTY AND LOCAL GOVERNMENT

Southeastern Association of Governments

D. PRIVATE INDIVIDUALS AND ORGANIZATIONS, INDUSTRY AND NONINDUSTRY

J. F. Addington, President, Marad Exploration Corp.; Jerry D. Reid, Exec. Vice President, Mountain States Resources; Gene Veselka, Vice President, Mountain States Resources Corp.; Robert E. Cohenour, Geologist, Mountain States Resources Corp.; Bob Blackett, Geologist, Sanders Associates, Inc.; and Rick Collins, Botanist, Sanders Associates, Inc.

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.

Archeological Environmental Research Corporation, 1978, Archeological reconnaissance report: unpublished written report.

Bray, O. E. and Barnes, V. G., 1967, A literature review on black bear populations and activities for National Park Service: Colorado Coop. Wildlife Research Unit, 34 p.

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 inhabits southeastern Utah: Salt Lake City, Utah, Utah Div. of Wildlife Resources (in press).

Doelling, H. H., 1972, Central Utah coal fields, Sevier-Sanpete, Wasatch Plateau, Book Cliffs, and Emery: Utah Geol. and Mineralog. Survey, Mono. no. 3, 571 p.

Ellis D. H., Smith, D. G., and Murphy, J. R., 1969, Studies on raptor mortality in western Utah: Provo, Utah, Brigham Young University, The Great Basin Naturalist 29 (3), p. 165-167.

Environmental Research and Technology (ERT), 1978, Regional statement component for the southwest Wyoming coal development, environmental statement - climate and air quality section: ERT document P-3661-B.

Fair, Jeffrey S., 1977, Utah cougar harvest, 1976-77: Utah State Div. of Wildlife Resources, publication no. 77-10.

Gillio, D. A., 1975, Archeological reconnaissance report - October 7, 1975: USFS unpublished written report.

Pueschel, R., Allee, P. Z., Wellman, D. L., Roberts, W. F., Wagner, W. W., Thoem, T., 1978, Variabilities in visibility in east-central Utah, (in press).

Seidensticker, J. C., Hornocker, M., Wiles, W., and Messick, J., 1973, Mountain lion social organization in the Idaho Primitive Area: Washington, D. C., Wildlife Society, Wildlife Monographs, no. 35, December, 1973, 60 p.

Seton, E. T., 1909, The black bear, in Lives of game animals: Boston, Mass., Charles T. Branford Co., p. 119-190.

Skinner, M. P., 1925, Bears in Yellowstone. Chicago, Ill., A. C. McClurg and Co., 158 p.

Utah Department of Transportation, 1976, Traffic on Utah highways, 1975: Salt Lake City, Utah.

Utah Division of Wildlife Resources, 1977, Utah upland game annual report 1976, Darrell Nish, ed.: Salt Lake City, Utah, UDWR publication no. 77-6.

Ward, Lorin A., 1973, Elk behavior in relation to multiple uses on the Medicine Bow National Forest, West Assoc. State Game and Fish Comm.: Salt Lake City, Utah, proc. 53:125-141.

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

Wikle, Les, 1977, Archeological reconnaissance report - August, 1977: USFS unpublished written report.

Winn, David S., 1976, Terrestrial vertebrate fauna and selected coniferous forest habitat types on the north slope of the Uinta Mountains: Salt Lake City, Utah, U.S. Forest Service, Wasatch National Forest, 145 p.

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

Skumpah Canyon Mine

Lease No. U-0141177

Proponent: Energy Reserves Group, Incorporated

Site Specific Statement

Energy Reserves Group, Incorporated

Skumpah Canyon Mine

CONTENTS

Page

ILLUSTRATIONS

TABLES

ENERGY RESERVES GROUP, INCORPORATED

SKUMPAH CANYON MINE

CHAPTER I: DESCRIPTION OF THE PROPOSED ACTION

A. INTRODUCTION

Energy Reserves Group, Inc., has submitted for approval a mining and reclamation plan for an underground mine to produce 1 million tons of coal per year (mty) from Federal and private land (table 1, figs. 1 & 2; Federal lease No. U-0141177). The purpose of this statement is to analyze environmental impacts that could result from implementing this plan. Future modification or changes in the plan may require additional impact analysis at a later data.

The company has also submitted preliminary plans for transportation, utilities, and other facilities needed before the mining and reclamation plan can be fully implemented (table 1). Some of these are off the lease area. Future Federal actions and additional environmental assessment will be required when applications and detailed plans for these activities are formally submitted for approval.

The proposed minesite is located in northeastern Sevier County, near the mouth of Skumpah Canyon, a southwest trending tributary to Salina Creek (fig. 3). Access to the property is from Interstate highway 70, via unimproved Forest Development Road 40009 which is also the primary proposed haul road.

The proposed action will require prior approval of the following: the mining and reclamation plan, by U.S. Geological Survey (GS) with concurrence of the USDA Forest Service (USFS); applications for access and powerline rights-of-way, by Bureau of Land Management (BLM) and USFS (fig. 1); construction of a bridge across Salina Creek (fig. 4) would require a permit pursuant to section 404(b) of the Federal Water Pollution Control Act Amendments of 1972, P.L. 92-500, by Corps of Engineers; and a special land-use permit would be required from the USFS for access between the mine portal and main surface facilities (fig. 4).

B. PROPOSED ACTION

The company proposes to mine the main Ivie bed of the Blackhawk Formation between the Musinia fault zone and the Acord Lakes fault (fig. 5). Coal reserves are estimated at 70 million tons. In addition, the company hopes to mine across the Acord Lakes fault for access to an estimated 12 million tons of privately-owned coal within the lease area east of the fault (fig. 5). At a 50 percent recovery rate, coal mined would be 35 million tons west of the Acord Lakes fault, and 6 million tons east of the Acord Lakes fault. At the proposed production rate of 1 million tons of coal per year mine life would be over 40 years.

The proposed minesite is located in northeastern Sevier County, near the mouth of Skumpah Canyon, a southwest trending tributary

Table 1.--Summary of land ownership, mining and reclamation plan, and ancillary facilities

Land ownership (acres):

	Federal surface	Private surface	Total
Federal coal lease	680	1,820	2,500
Private	0	4,020	4,020
Total	680	5,840	6,520

Market	Unspecified
Estimated coal reserves (millions of tons):	
In place	82
Recoverable	41
Expected mine life (years)	42
Production rate (mty)	1
Development schedule (years):	
Initiation to production	1
Initiation to full production	2.3

Surface disturbance (acres):

	State and private land	Federal land	Total
Mine plantsite	17	3	20
Rock waste	±10	0	10
Settling pond	± 5	0	5
Access road 3 miles[1]	6	13	19
Powerline 10 miles[1]	8	0	10

Other requirements:	
Water (acre-ft/year)	
Industrial A	80
Increased population (offsite)	350
Personnel requirements:	
Mine operations (including support)[2]	290

[1] No permit application filed.
[2] Based on production rate of 15 tons per manshift.

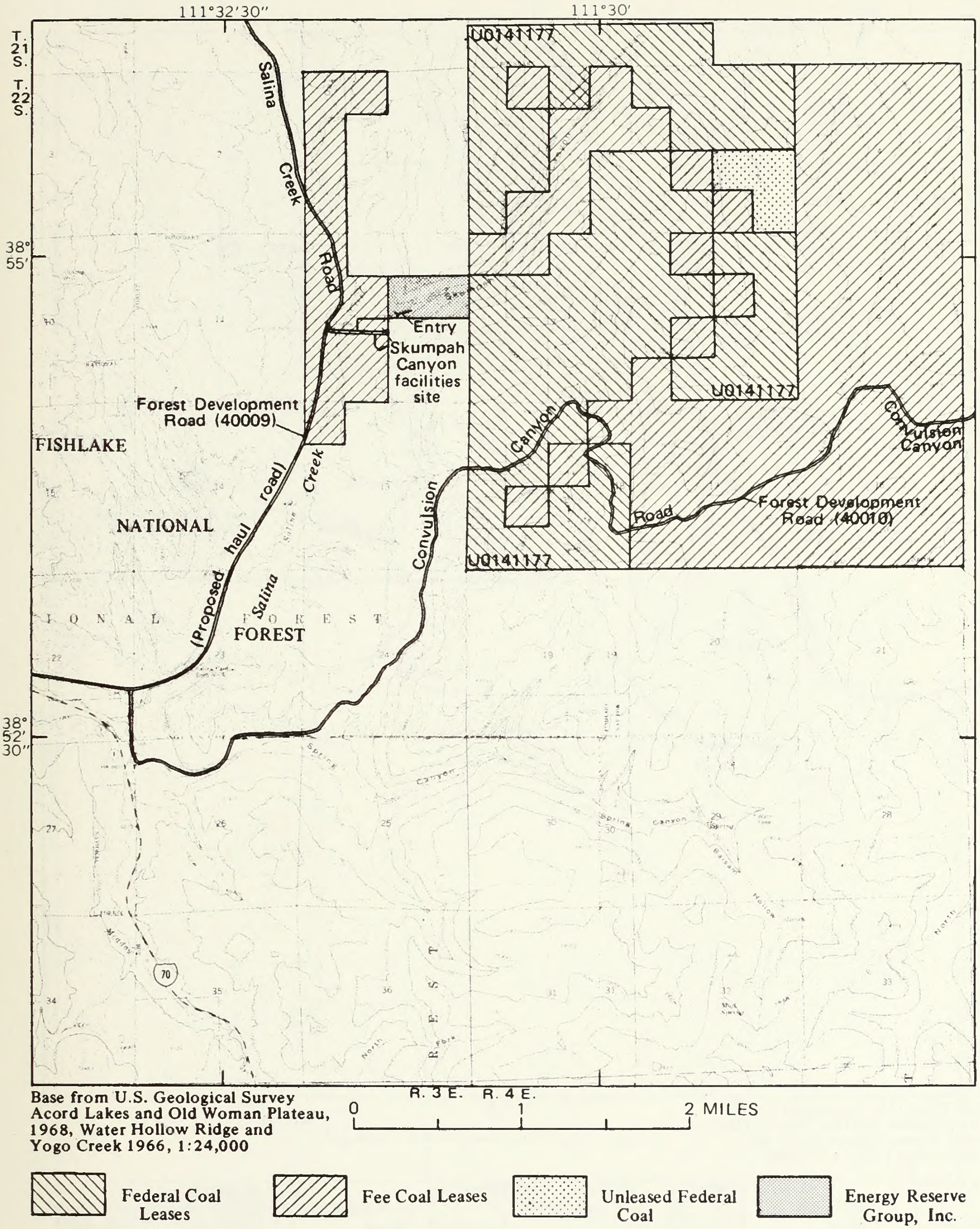


Figure 1.--Map showing surface ownership of the Skumpah Canyon mine, Sevier County, Utah.

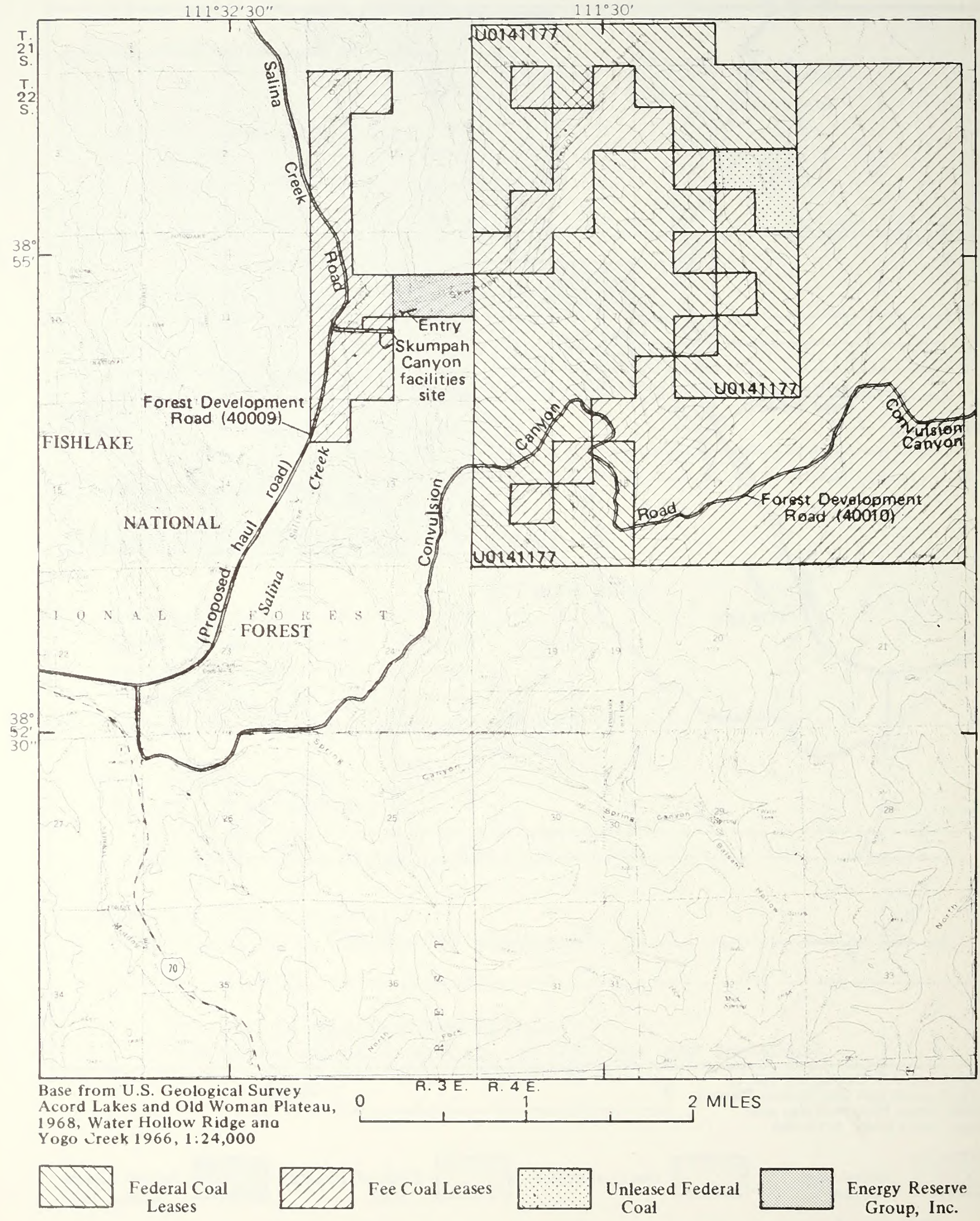
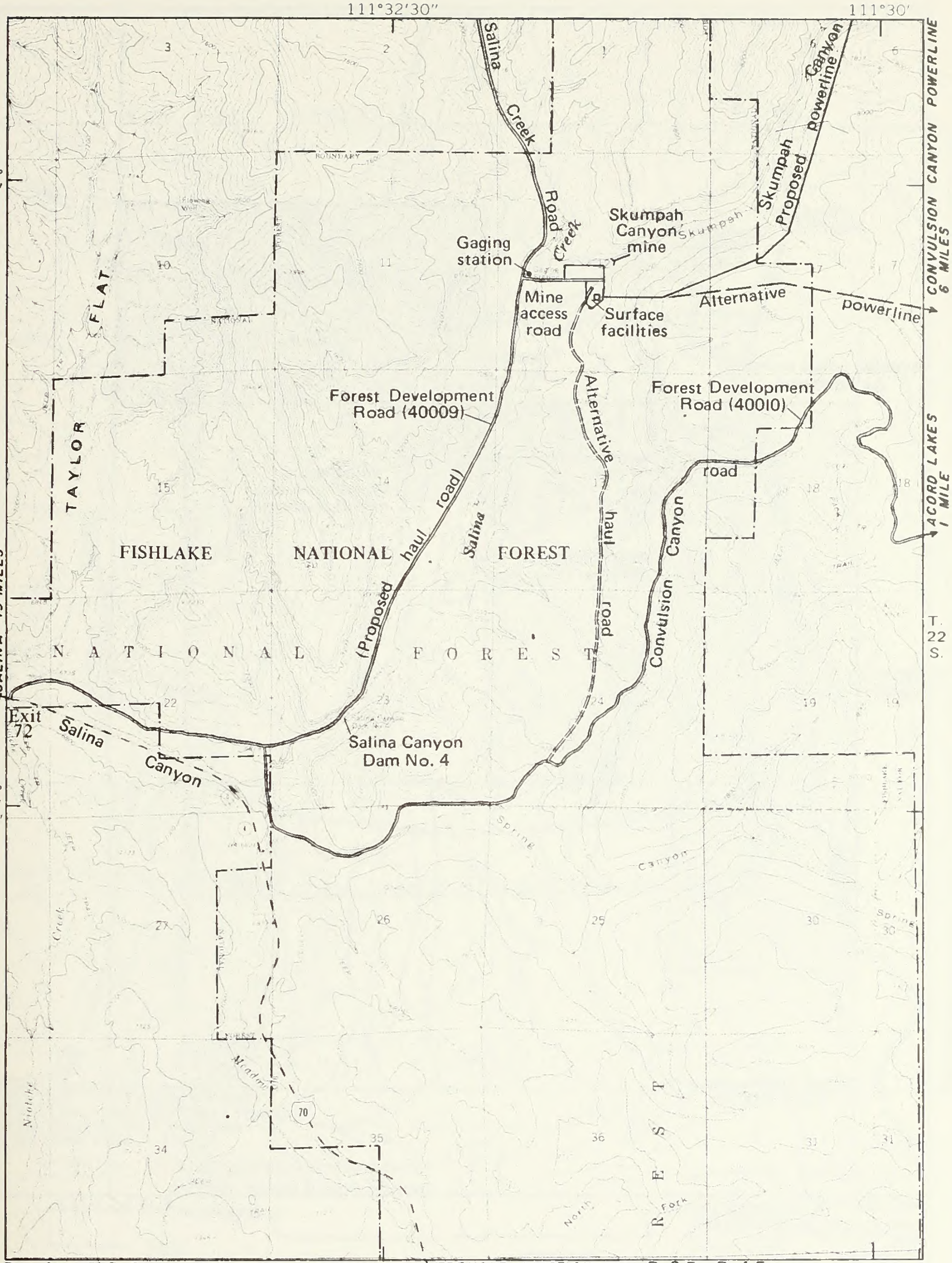


Figure 2.--Map showing subsurface coal ownership for the Skumpah Canyon mine.



Base from U.S. Geological Survey Acord Lakes and Old Woman Plateau, 1968, Water Hollow Ridge and Yogo Creek 1966, 1:24,000

Figure 3.--Map showing proposed site, roads, and utility lines, Skumpah Canyon mine.

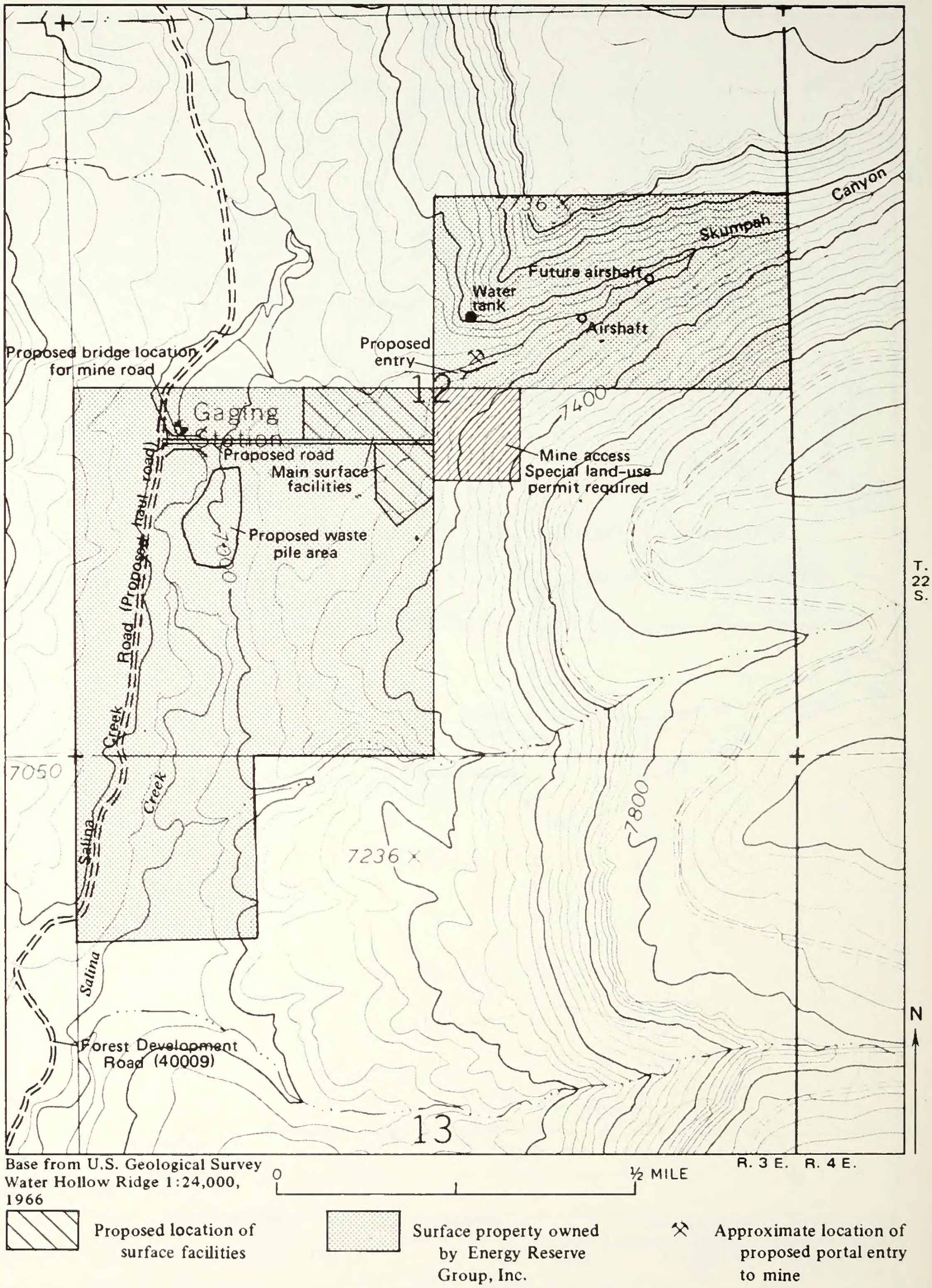


Figure 4.--Map showing proposed surface site for the Skumpah Canyon mine.

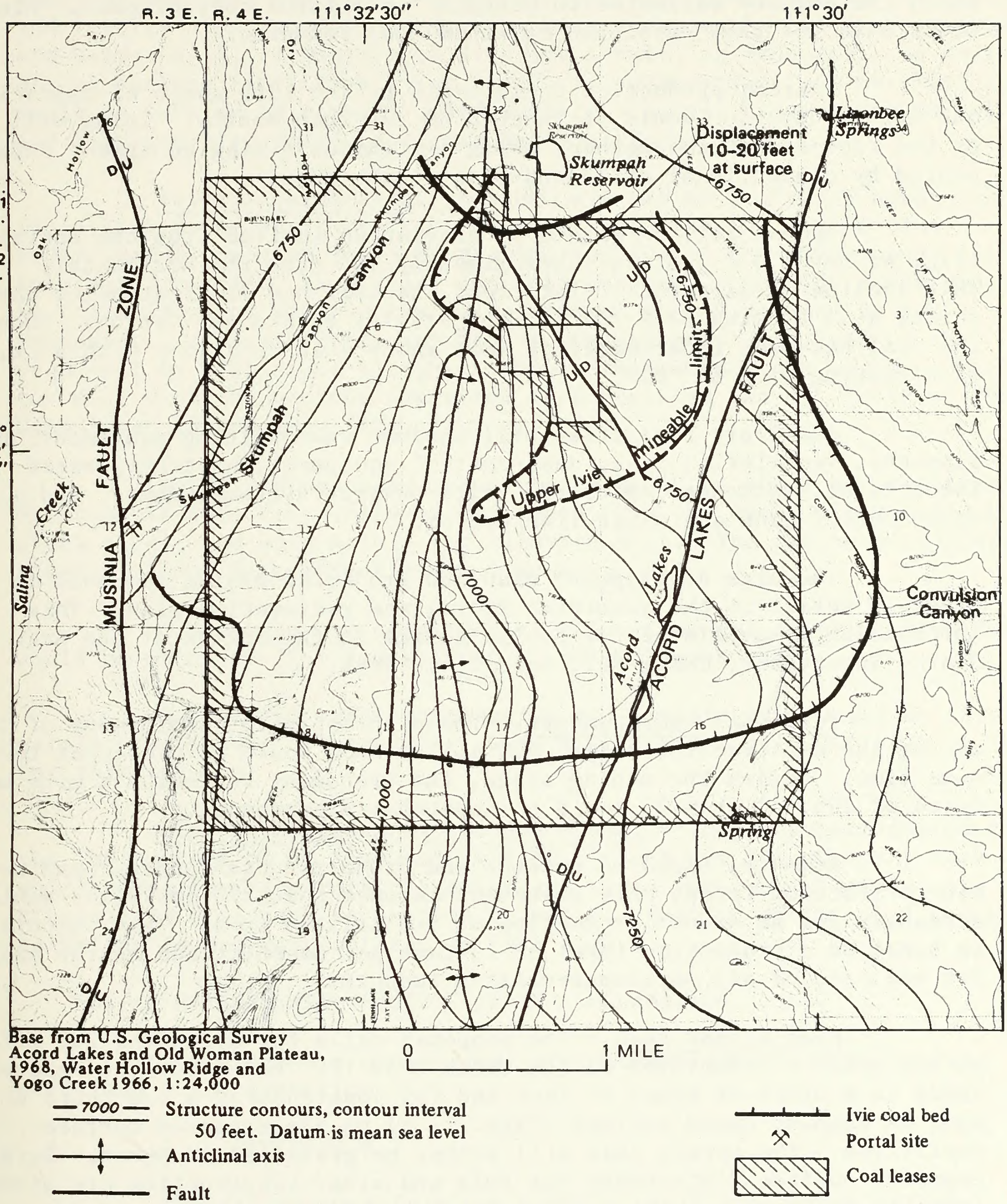


Figure 5.--Map showing the minable extent of the Ivie coal bed, Skumpah Canyon mine.

to Salina Creek (fig. 3). Access to the property is from Interstate highway 70, via unimproved Forest Development Road 40009 which is also the primary proposed haul road.

The leasehold also includes the upper Ivie coal bed (fig. 5), which the company estimates to contain 7.8 million tons of coal. Mining plans have not been developed for this coal resource.

Initial production would begin by the 13th month of operations and full production would be reached by the 28th month. Mining will be by the room-and-pillar method, using continuous mining equipment supplemented by conventional drill-and-blast techniques.

Access will be gained by driving an incline from the portal (fig. 4) for 1,022 feet, at approximately 18° from the horizontal. This incline is expected to intersect the coal bed 313 feet below the portal at a bearing of N 78° E., subparallel to Skumpah Canyon. Once the coal has been intersected, a main entry will be driven within it, at a bearing of S 65° E.

Ancillary facilities will include roof-bolting equipment, roof supports, ventilation fans, dust-control equipment, battery-powered locomotives, personnel carriers, belt-conveyor systems, pumps, and a fire-control tank and water-line system.

The mine development plan and projected mining sequence is given in detail in the submitted mining and reclamation plan. This information is available for public review in the office of the Area Mining Supervisor, USGS, Salt Lake City, Utah.

<u>Personnel requirements</u>.--The plan calls for employment of 128 during the construction stage, not all of whom would be needed at the same time. During the mining stage, the proponent estimates a mine workforce of 206, of whom 34 would be supervisory personnel.

However, based on current and projected Utah underground coal mine production rates, this statement assumes that 290 employees would be necessary for an annual production of 1.0 million tons. This calculation is based on a production level of 15 tons per manshift and is the basis for analysis of all workforce-related impacts.

<u>Mine access road</u>.--The proposal calls for upgrading 2.7 miles of the present unimproved Salina Creek road (FD road 40009) on Federal lands to a width of about 40 feet and for constructing a one-third mile spur on company owned surface (figs. 1, 4) to the proposed surface facilities. The access road will either be gravelled or paved. Data on expected surface disturbance for this and other construction are given in table 1.

Although no market has been identified, the coal would be hauled by trucks (approximately 25-ton payload) down the upgraded access road to Interstate 70, and then most likely to the railhead at Salina, approximately 19 miles west (fig. 1), or directly to market. Truck haulage to Emery (about 30 miles east via I-70 and U-10) is comtemplated, if a railroad is built in Castle Valley and extended to Emery.

Mine-portal facilities.--The facilities area (fig. 4) would include: entries, shop, warehouse, office, bathhouse, supply yard, storage and loading bins, powder storage, parking area, water tank, airshaft(s), and water wells. A waste-rock area and a settling pond would be south of the surface facilities. The facilities waste-rock, and settling pond would be located on company owned surface. Access between the portal and main facility would be across National Forest land.

Power requirements.--A 5,000 kVA, 69 kV to 7.2 kV substation would have to be built by Utah Power & Light near the mine portal. Power inside the mine would be transmitted by a 7.2 kV mine-power cable, shielded, grounded, insulated, and MESA approved. Outside power would be transmitted on power poles to be erected and maintained by the proponent. A possible transmission route has been suggested to the proponent by Utah Power & Light. About 8 miles long, it would connect the mine with the present powerline in Convulsion Canyon, south of the Convulsion Canyon mine (fig. 1).

Water.--Mine water requirements would be about 80 acre-feet/year. Water would come from wells or be pumped from the mine, distributed in steel pipes, and used mainly for allaying dust. The proponent anticipates treating about 8 acre-feet/year of sewage.

Other resource commitments.--Limestone for allaying mine dust would be obtained from unspecified commercial sources.

Gravel for road construction and improvements would be obtained mainly from commercial sources. Some mine-waste rock could also be used for this purpose.

Mine-waste production and disposal.--The proponent states that the "only waste to be disposed will be 20 tons per day of waste rock which comes from the rotary breaker and waste rock out of the mine." Disposal is discussed in section C, below. Washing of the coal before marketing is not contemplated at this time.

C. ENVIRONMENTAL PROTECTION AND RECLAMATION

The company proposal and later communications from company officials state specifically:

1. PROTECTION

Topsoil removed from the surface facilities sites will be stockpiled nearby and used for future reclamation of the sites.

Surface facilities will be painted to blend into the landscape.

All mining methods and equipment used will be MSHA approved.

Coal will not be mined beneath the Acord Lakes (fig. 5), and pillars will not be pulled in the vicinity of major faults.

The mine will not extend east of the Acord Lakes fault (fig. 5) should engineering and hydrologic problems be encountered while driving across the fault.

Coal seams as thin as 4 feet will be mined if economically feasible.

Mine dust will be allayed with water, and with limestone from commercial sources.

Any mine water will be filtered and treated before it is returned to the hydrologic system.

Any other water returned to the hydrologic system will first be flocculated and treated.

Public supply water will be chlorinated before distribution and use.

Sewage will be mechanically treated.

Waste rock from the mine "will be placed in a proper place on the property and leveled, allowing no drainage to pass over it."

A rock berm will be placed on the lower, west side of the mine-waste pile to prevent contamination of Salina Creek (fig. 4).

Dust would be abated by wetting the haulage road at regular intervals, or possibly by upgrading the road to reduce or eliminate dusting.

2. RECLAMATION

A reclamation plan, to begin shortly after mining has ceased, is to include:

(1) Cementing and closing all portals and ventilation shafts.

(2) Filling and restoring settling ponds.

(3) Removing all buildings and cement foundations.

(4) Applying at least 2 feet of topsoil on the building sites. Topsoil removed prior to construction would be stockpiled for this purpose.

(5) Applying 2 feet of topsoil on all coal dust, filtration ponds, and leveled waste-rock stockpiles.

(6) Recontouring the disturbed surface areas to fit the preexisting topography.

(7) Reseeding and tree planting; seed to be recommended by the USFS.

The proponent's post-mining reclamation objective will be "to maintain an environmentally balanced system of preservation of the ecosystem present in the area, to prevent contamination of hydrologic zones and to reclaim any disturbed area as soon as possible. The removal of buildings and the placing of topsoil on any coal dust and reseeding should accomplish our main objectives after the mining operation is complete."

D. LEGALLY ENFORCEABLE MITIGATING MEASURES

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 and Reclamation Act (SMCRA) of 1977 (PL 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, in this statement the applicable initial regulations are considered as a required Federal mitigating measure.

The mining and reclamation plans will be returned to the operator together with a request that they be revised in accordance with the applicable initial regulations. As soon as the mining and reclamation plans are revised and returned to the U.S. Geological Survey (GS) they will be evaluated with the Office of Surface Mining to determine compliance with the requirements of Federal regulations at 30 CFR 211 and 30 CFR 700. The mining and reclamation plans cannot be approved until they conform to all applicable requirements.

(1) 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 local land surface administering office.

(2) Areas disturbed in construction and not covered by facilities will be revegetated to reduce erosion, in accordance with USFS and USGS specifications.

(3) During upgrading of the present FD road 40009, any relocation will be far enough away from Salina Creek to prevent fill material and coal spills from entering the stream (fig. 1).

(4) Degradation of aquatic and riparian habitat by roadwork along Salina Creek will be partly mitigated by constructing settling basins to trap silt and by limiting construction near the creek (fig. 1).

(5) Bridge construction over Salina Creek will be low in profile and of a color that blends with the environment (fig. 4).

(6) Telephone and other utility lines will be placed in the designated travel-route corridor or buried, if possible, in the road profile, rather than being located in areas undisturbed at present.

(7) Barrier pillars of adequate thickness will be left along and near faults and beneath cliffs, canyons, and the Acord Lakes, to protect surface values (fig. 5).

(8) No coal will be mined near the Skumpah (Skutumpah) Reservoir and dam (fig. 5).

(9) The mine-waste pile, settling pond, and other unstabilized facilities will not be located upon or adjoining known faults (fig. 5).

(10) The waste-rock pile will be shaped, compacted, graded, and protected by drainage ditches or bars to reduce contact with runoff water and the likelihood of erosion and landsliding (fig. 4).

(11) Once the waste-rock pile is no longer in use, it will be reshaped to blend with the surrounding topography, covered with a soil layer of a thickness approved by the appropriate regulatory agency, and revegetated and irrigated in accordance with the requirements of that agency.

(12) Subsidence fractures caused by mining, considered by the appropriate regulatory agencies to be wide and deep enough to entrap livestock and wildlife, will be fenced to exclude such animals.

(13) All mining activities will meet the requirements of the Federal Water Pollution Control Act Amendments of 1972, PL 92-500. The discharge of dredge or fill materials in or adjacent to Salina Creek shall be approved by the Corps of Engineers or EPA, whichever is applicable, in accordance with Sec. 404 of the Federal Water Pollution Control Act Amendments of 1972.

(14) No wastes shall be placed where they will cause pollution of any waters of the State, and no waste water shall be discharged or allowed to enter any waters of the State unless it meets the water quality standards required by the State (Title 73-14-1, et al.) or EPA, whichever is applicable. Reasonable enforcement of mitigations should prevent degradation of water quality.

(15) If the flow or yield of any springs, streams, or wells from which water has been appropriated or which are deemed significant to the human environment, is reduced by mining, the company will replace the water in kind or make restitution as required by the State (Title 73-3-23) or the Office of Surface Mining Reclamation and Enforcement, whichever is applicable. In order to have the information needed to determine the effect of mining on water, the company will be responsible for inventorying said water resources before mining and for monitoring the flow of springs and streams, the water level in wells, and the chemical quality of these waters during mining.

(16) Garbage and other solid wastes other than mine-waste rock will be disposed in compliance with EPA regulations.

(17) The State law requiring coal trucks to be covered will be enforced.

(18) Each 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 should use an appropriate combination of the following fugitive dust control:

a. Pavement or equivalent stabilization of all haul roads used or in place for more than 1 year.

b. Treatment with semipermanent dust suppresant of all haul roads used or in place for less than 1 year or for more than 2 months.

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

d. 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.

(19) No mining or rights-of-way will be approved until the surface management agency has coordinated professional cultural resource (cultural resources include archeological, architectural, and historical remains) surveys with the Utah State Historic Preservation Officer and received his written comments, and review. Additional surveys and mitigation may be necessary if surface evidence indicates further evaluation is necessary. In event of discoveries of buried cultural resources as the result of exploration or mining activities, the operator will notify the USGS and the surface managing agency immediately and suspend operations.

The authorizing office will comply with the basic 1906 Federal Antiquities Act (P.L. 59-209; 34 Stat. 225), the National Historic Preservation Act of 1966 (P.L. 89-665; 80 Stat. 915), the Historical and Archeological Data Preservation Act of 1974 (P.L. 93-291), and the subsequent Federal regulations which provide legal backing and instructions for cultural resource inventory and protective consideration of sites.

(20) Prior to any land disturbing activities a survey for threatened or endangered plant species will be taken. Any listed species found will be protected (see part 1, chapter III, no. 7 Endangered Species).

E. INTERRELATIONSHIP WITH OTHER PROJECTS AND PROPOSALS

Location of present and proposed nearby mines are given in chapter II of this site-specific statement, and in chapter II of the regional EIS, part 1. Identified transportation problems that would result from the interrelation between the proposed action and the present Convulsion Canyon mine of Coastal States Energy Company are addressed in chapters III and V of this site specific.

Other identified problems that would result from the above interrelation involving water resources, fish and wildlife, land use, socioeconomics, recreation, and esthetics are addressed in the regional EIS, part 1.

CHAPTER II: DESCRIPTION OF THE EXISTING ENVIRONMENT

A. NATURAL ENVIRONMENT

1. CLIMATE

The general climate is described in part 1, chapter II. Average temperatures at the proposed minesite are probably 2° to 4°F cooler than at Emery, which is 14 miles east, 800 feet lower, and on the leeward side of the plateau. Average monthly temperatures at Emery range from about 25°F in January to 70°F in July. Annual precipitation averages about 20 inches at the site and 25 inches about 6 miles northeast in the headwaters of Skumpah Canyon. The 100-year 6-hour precipitation is 2.3 inches. Potential evaporation averages 35-45 inches per year. Maximum accumulation of snow averages 3 feet.

2. LAND

a. Geology

The proposed minesite lies on the rugged western slope of the southern Wasatch Plateau. Altitudes range from 6,970 at Salina Creek near the minesite to 8,613 feet on the high ridge between Skumpah Canyon and the Acord Lakes (figs. 1, 4). Local relief above Salina Creek commonly exceeds 700 feet.

Exposed formations on the leasehold include, from bottom to top: the upper part of the 900- to 1,000-foot thick Blackhawk Formation, exposed along Skumpah Canyon and along the steep lower and middle slopes of the plateau; the 300-foot thick Castlegate Sandstone, which forms vertical cliffs above the middle of the slopes; and the 450-foot thick Price River Formation, which forms the gentler upper slopes and caps the plateau surface. These formations are described in part 1 chapter II. Overburden ranges from 900 to 1,600 feet over much of the mine area, but may be as thin as 450 feet under Skumpah Canyon and 650 feet east of the Acord Lakes fault (fig. 5).

The Musinia fault zone contains normal faults, which are either vertical or steeply dipping to the west. Vertical displacements within the fault zone exceed 2,000 feet in this area and have brought the North Horn Formation (of the west block) down against the Blackhawk Formation. The north-northeast trending Acord Lakes fault is similarly a vertical or high-angle normal fault, down-faulted on the west. Vertical displacement along the fault is 300 to 400 feet, decreasing southwestward. Two minor northwest-trending faults, with postulated vertical displacements of about 20 feet each, are present within the block (fig. 5). A joint system, oriented at about N. 20° W., appears to be spatially associated with the faulting.

Forest Development Road 40009 (Salina Creek road), between the minesite and Interstate 70, lies entirely within the Musinia fault zone, crosses two major faults, and lies mostly upon alluvium of Salina Creek (figs. 1, 5). The bedrock units exposed along the road include the Blackhawk, Castlegate, and North Horn Formations. The proposed major surface facilities and waste pile would be constructed upon a colluvium-covered, gently sloping pediment surface cut on the North Horn Formation and entirely within the downfaulted western block. The proposed mine portal, airshafts, and water tank would be on the Blackhawk Formation of the upthrown eastern block (figs. 4, 5). The proposed power transmission route will cross the Star Point, Blackhawk, Castlegate, and Price River Formations, and some alluvium (fig. 1).

Owing to the high relief and rugged topography and to the presence of thick, massive, and resistant cliff-forming sandstone beds along steep slopes, rockfalls and occasional small to moderate landslides (rock and debris slides) have occurred naturally in the past. The Castlegate Sandstone and much of the Blackhawk Formation are particularly prone to rockslides and falls.

No paleontologic resources are known to be present, and the project area has had a detailed paleontological detailed survey. A general summary of the principal fossilferous formations, ages, number of known fossil localities, and general fossil types is presented in part 1, chapter II.

b. Energy and Minerals

The Ivie bed is present locally within the lower part of the Blackhawk Formation, at altitudes ranging from less than 6,750 to more than 7,235 feet (fig. 5). Spotty drillhole data indicate that it forms an irregularly circular, lenticular body that is 14 feet or more thick and that thins irregularly to 4 feet or less toward the project boundaries. Average thickness is 9 feet. The same data indicate the presence of a north-trending anticlinel flexure between the boundary faults, discernible by contouring on the top of the Ivie bed (fig. 5). Maximum closure on this structure is probably no more than 300 feet. The Ivie bed dips gently toward the boundary faults.

"Proven" coal resources for the bed, where it is 5 feet or more thick and present within the lease area between the boundary faults (fig. 5), are estimated at 69.5 million tons. Probable resources of 14.8 million tons are indicated for the area east of the Acord Lakes fault, of which 11.9 million lie within the lease area. An additional probable resource of 13.6 million tons is indicated within unleased Federal lands peripheral to and within the leased block.

Additional probable resources where the Ivie bed is 4 to 5 feet thick, are about 2.2 million tons, present mainly near the south edge of the mine area (fig. 5).

The Upper Ivie coal bed is locally present 20 to 60 feet above the Ivie bed. Within the lease area, it seems to range from 0 to 7 feet thick and is thickest between Skumpah Reservoir and the Acord Lakes (fig. 5). Proven and probable resources within the fault block, including unleased lands, are estimated at 10.1 million tons (7.8 million tons within leased lands). Some other thin, laterally restricted coal beds are present within the lease areas. They are not currently economically minable and the resource has not been estimated.

Analytical data from 10 drill-hole cores indicate that Ivie coal runs 11,042 Btu/lb, 0.45 percent sulfur, 12.3 percent ash, and 7.9 percent moisture. Analyses of three cores show an average of 11,674 Btu/lb, 0.53 percent sulfur, 7.1 percent ash, and 9.5 percent moisture.

The only operating mine in the area is the Convulsion Canyon (formerly Southern Utah Fuel) mine, operated by Coastal States Energy Company (part 1, fig. I-2, item E17). It is about 6 miles east of the proposed mine. Energy Reserves Group's Knight mine, on private land north of I-70 (part 1, fig. I-2, item E20), 11 miles south-southeast of the proposed mine, began production in 1977. Conceptual mine plans have been proposed by Energy Reserves Group for the Rock Canyon area, south of the proposed mine, and by L. R. Hansen, for the area of the old Boston Acme Mine No. 2, west of the proposed mine. Locations of lease properties are shown in part 1, chapter I. Several other small mines and prospects in and near Salina Canyon and west of the Boston Acme No. 2 mine, were worked before 1954 (Doelling, 1972, p. 41), but none are active at the present time.

Seismic prospecting for oil and gas is going on at present north of Skumpah Canyon, and most or all of the area is under oil or gas leases.

c. Soils

The lease area is within the Ridges and Valleys Landtype Association, as mapped in the Land Systems Inventory, Salina Planning Unit, Fishlake National Forest (U.S. Forest Service, 1975), and includes Soil Associations 1 (dark colored, usually moist, high mountain soils) and 22 (dark colored, soils of the mountains, plateaus, and terraces, usually dry during the summer), as mapped in Soils of Utah (Utah State University and others, 1975). The portal and surface facilities sites would be entirely within Soil Association 22, which covers the western half of the lease area (fig. 5). Soil Association 1 covers the east half of the lease area. These Soil Associations are described in part 1, chapter II.

Based on the Land Systems Inventory for the Salina Planning Unit (U.S. Forest Service, 1975), 8 landtypes are present (tables 2, 3).

Table 2.--Landtype characteristics and qualities at the Skumpah Canyon mine

Land-type No.[1]	Landform	Surface soil	Subsoil and substrate	Est. sediment yield (cu yds/acre/yr) natural	if exposed	Mass stability	Probability of range reseeding success percent
8	Wet alluvial lands	Loam to silty clay loam with high organic matter content. Usually over 15 inches thick.	12 to 19 inches of silty clay loam overlying sandy loam soils. Low coarse fragments.	0.3 VL	1.4 ML	Stable	More than 70 (good)
15	Ridges and complex sideslopes	Dark colored loams ranging in thickness from 4 to 14 inches.	Weakly developed with sandy loam to clay loam textures. High in coarse fragments.	1.0 L	5.0 H	Stable	30 - 70 (fair to poor)
16	Gullied alluvial lands	Sandy loams 6 to 10 inches thick.	Weakly developed clay loam subsoils over deep fine sandy loams and fine sandy clay loams.	0.8 L	2.0 M	Stable	50 - 70 (fair)
19	Long steep slopes	Dark brown to reddish colored sandy loam to clay loam. About 8 inches thick.	Subsoils are moderately thick in clayey soils, but bedrock is at less than 20 inches on sandy soils.	1.2 L	5.5 H	Moderately stable	30 - 50 (poor)
20	Mesa tops and toeslopes	Dark colored silt loams about 10 to 12 inches thick.	Subsoils are gravelly loams and clay loams that are about 12 in. thick. They overlie loamy materials that are high in coarse fragments and lime.	0.4 VL	1.4 ML	Stable	50 - 70 (fair)
21	Rock structured canyon walls	Loamy soils high in cobbles and stones.	Loam to silty clay loam. High in coarse fragments.	0.8 L	1.8 M	Unstable when cut	Less than 30 (very poor)
23	Steep, barren canyon walls	Rock outcrops and ledges are common. Soils are reddish or grayish clay slopes.	Deep silty clay on colluvial slopes	2.5 MH	6.0 H	Moderately stable (rock fall)	30 (very poor)
26	Dissected fans and toe-slopes	Dark colored sandy loams about inches thick.	Thin, weakly developed sub-soils over deep sandy loams.	0.5 L	2.0 M	Stable	50 - 70 (fair)

[1] The landtype descriptions given in the Land Systems Inventory, Salina Planning Unit Fishlake National Forest (U.S. Forest Service, 1975) were used for information on landform, soils, and mass stability. Estimated sediment yields were computed using the system developed by the Pacific Southwest Inter-Agency Committee (1968), and the probability of reseeding success was estimated by using the system developed by Hagihara, and others (1972).

Table 3.--Acreage of each landtype occurring on lands proposed to be disturbed by the Skumpah Canyon mine project

Facility	Landtype No.	Acres
Mine portal	19	2
Surface facilities	8	9
	26	9
Access road	8	4.6
	16	9.3
	21	1.3
	26	3.3
Waste pile and settling pond	26	15
Powerline	8	0.2
	15	3.7
	16	1.4
	20	1.6
	21	2.3
	23	1.3

3. WATER

a. Water Supply

1. Surface Water

The area to be mined underlies the lower reaches of Skumpah Canyon and a part of the Acord Lakes watershed (fig. 5). Skumpah Canyon is tributary to Salina Creek, which is tributary to the Sevier River. Water on and near the property is used locally by wildlife and livestock, and water from Salina Creek is used for irrigation in the Sevier River basin. Salina Creek is perennial, and flow records from the USGS gaging station just below the mouth of Skumpah Canyon (fig. 1) show for the period 1963-75 an average discharge of 17.7 cfs (12,800 acre-feet/year), a minimum discharge of 1.7 cfs, and concentrations of dissolved solids as 250-300 mg/L (U.S. Geological Survey, 1976). The flow in Skumpah Canyon is controlled in part by Skumpah (Skutumpah) Reservoir, 3 1/2 miles upstream from the mouth (fig. 5). Skumpah Reservoir, 23 acres, has a capacity of 115 acre-feet. The drainage area above the proposed mine is 13.3 square miles: 9.3 square miles above the reservoir and 4.0 below. Runoff from Skumpah Creek is estimated on the basis of flow records on Salina Creek to be 3,200 acre-feet/year.

The Acord Lakes watershed has internal drainage; all streams end in one of the two Acord Lakes. The lakes are shallow and usually dry up in late summer. Presumably, much of the lake water seeps into the ground, while the rest evaporates. Area of the lakes is about 15 acres. The drainage area is 6.2 square miles, and annual runoff is 600 to 1,000 acre-feet.

2. Ground Water

The divide between the Sevier (Salina Creek) and Colorado (Convulsion Canyon) systems runs west of the Acord Lakes (fig. 5); about 70 percent of the mine area drains to Salina Creek and 30 percent to Convulsion Canyon. Ground water, paralleling surface flow, moves west near the portal but may flow east near the Acord Lakes. About 80 percent of the 25 inches of annual precipitation is consumed by evapotranspiration, leaving about 5 inches for runoff and ground-water recharge. Recharge is probably much less than 2 inches per year.

Recharge infiltrates down to perched water layers in the Castlegate Sandstone and Blackhawk Formation, and then into Skumpah Canyon to sustain a baseflow of less than 50 gal/min. A cased test hole near the portal site (fig. 4) flows about 10 gal/min. into the creek.

Along the Acord Lakes fault, the Lizonbee Springs issue from alluvium or faulted sandstone. The springs are half a mile north of the mine area (fig. 5) and flow intermittently to the Acord Lakes. Springs east of the Acord Lakes fault drain to Convulsion Canyon and the Colorado

River system. Several springs and a flowing well issue from limestone and shale of the North Horn Formation within the graben that includes Taylor Flat (fig. 3).

The proposed mine will lie between Salina Creek and Convulsion Canyon (fig. 5). The regional water table seems to lie at an altitude of 7,000 feet near Salina Creek. The creek in Convulsion Canyon is perennial at and below 7,200 feet.

Little is known of ground-water conditions below the coal. The Star Point Sandstone, which underlies the Blackhawk Formation, consists of fine- to medium-grained sandstone and shale. Well yields from the Star Point would probably be less than 10 gal/min., mainly from cracks and other fractures.

Ground water generally contains less than 500 mg/L dissolved-solids concentration and is suitable for domestic uses; the Lizonbee Springs, however, contain about 750 mg/L dissolved-solids concentration.

4. AIR

Air quality has not been monitored near the site; however, an annual average background level of total suspended particulate (TSP) for rural locations in southern and central Utah of 20 micrograms per cubic meter ($\mu g/m^3$) has been estimated by AeroVironment (1977). Air quality standards for particulates are shown in part 1, chapter III. The background visual range was estimated to be about 37 miles (60 km) and was based on the background TSP estimate (AeroVironment, 1977). Concentrations of other pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, and photochemical oxidants are insignificant.

5. VEGETATION

Most of the area is covered with either Sagebrush-Grass or Pinyon-Juniper Woodland type (fig. 6). The facilities area is covered with the Sagebrush-Grass type. The main species in the Sagebrush-Grass type are big sagebrush, big rabbitbrush, Utah juniper, horsebrush, wheatgrass, Indian ricegrass, and galleta grass. The Sagebrush-grass type is described in more detail, including a species list, in the Task Force files.

No threatened or endangered plants have been identified (Welsh, 1977).

6. WILDLIFE AND FISHERIES

Game species include: deer, elk, mountain lion, black bear, cottontail rabbit, snowshoe hare, ruffed grouse, blue grouse, mourning dove, and waterfowl. Furbearers include: beaver, muskrat, and mink; their habitat is limited to about 4 miles of Salina Creek and 3 miles of Skumpah Creek (fig. 1).

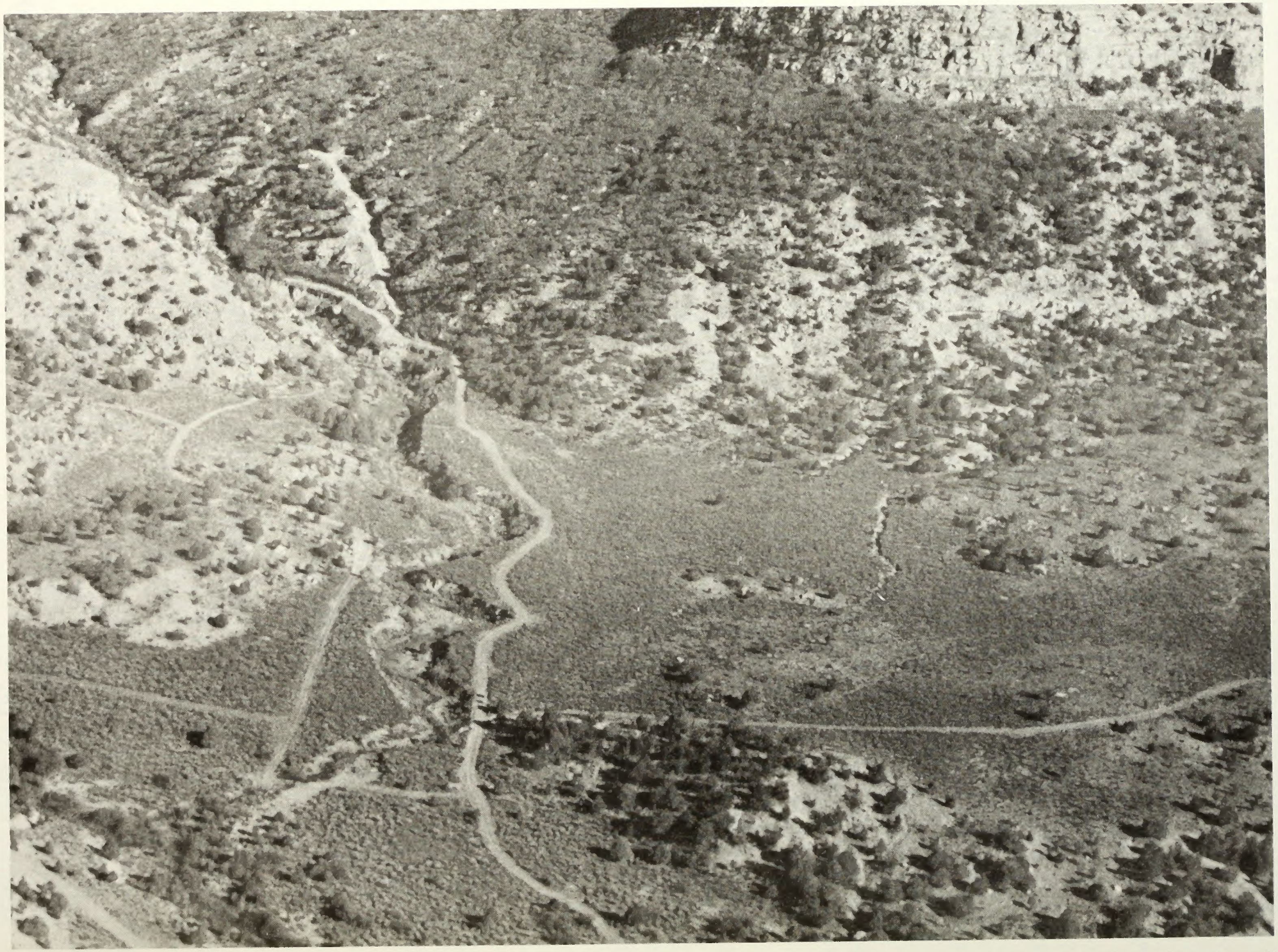


Figure 6.--Photograph showing eastward view of the proposed Skumpah Canyon minesite, Sevier County, Utah. The plantsite and coal surge bin would be in the sagebrush flat to the right of the drainage. The portal would be at the end of the steep dead-end road. The vegetation on the flat is Sagebrush-Grass and on the slopes is Pinyon-Juniper.

The lease area is popular for deer and elk hunting, but data are lacking on the local deer and elk population. Elk and deer are not generally found in large numbers on the portal or access facilities area during the regular hunting seasons. Harvest of both deer and elk within the entire project area would not average over 1 percent of the annual kill. The area is important, however, as a winter area and migration route. It is within the area designated as deer herd unit 43 (Salina) and elk herd unit 14 (Fishlake). It is in deer winter range and at the lower limit of elk winter range. Some deer and elk winter range has already been encroached by I-70 construction (fig. 1), a coal mine in Convulsion Canyon (about 6 miles east of proposed site), and summer homes near Acord Lakes (fig. 5). The effects of this encroachment have not been determined; however, it seems that deer and elk have changed their forage patterns to some extent to avoid these new developments. At present, the limiting factor for deer and elk is the lack of productive winter range.

Deer-vehicle strikes on the Fremont Junction to Salina section of I-70 are significant (fig. 1). The highway mortality on herd unit 43 during 1970-76 averaged 100 per year, 3.6 percent of the average yearly harvest on that unit. During the winter of 1972-73, 156 deer were killed on the unit by vehicles. Most kills are in Salina Canyon, southwest of the proposed mine. In addition, several deer are trapped and killed annually by fences along the freeway and access roads. Data on this loss are not available.

Data on mountain lion and black bear populations are not available; however, harvest data are known. Hunters killed 16 mountain lions on deer herd unit 43 during the 6-year period, 1971-77. During the 1976-77 season, hunters spent 152 hunter days afield on the unit and killed five lions. Mountain lions are generally distributed throughout the herd unit, but the greatest population is probably 3 miles east of Acord Lakes on the Old Woman Plateau (written commun., UDWR, 1977).

Bear hunters killed 17 bears on deer herd unit 43 during the 10-year period, 1967-77. The small population of black bear generally live at higher elevations than the proposed minesite.

Waterfowl use Salina Creek, Skumpah Reservoir, and the Acord Lakes, especially during spring and fall migrations. There are active beaver dams on Salina Creek and signs of past beaver activity on Skumpah Creek at the minesite. Salina Creek provides riparian habitat for numerous species of wildlife (fig. 1). For a more complete discussion of wildlife in the area, see part 1, chapter II and the Salina Planning Unit Land Use Plan (USDA Forest Service, 1976a).

No resident threatened or endangered species are known in the area (Boner, 1977; USDA Forest Service, 1976a). However, a migrant American peregrine falcon was sighted in 1976 on the Muddy Creek drainage, approximately 3 miles north of the proposed minesite and migrant bald eagles use Salina Canyon each winter (written commun. C. Jemmett, Manti LaSal Nat. Forest, 1977).

Fisheries include Salina Creek and Skumpah (Skutumpah) Reservoir. Salina Creek has a natural population of cutthroat, rainbow, and brown trout; it is not stocked annually. Skumpah Creek has not been inventoried, but, due to its small flow below the reservoir, it probably does not support fish.

Salina Creek has been designated as a Class III (minimum) fishery (fig. 1) (Utah State Division of Wildlife Resources). No use data are available for this stream; it is, however, a popular fishing stream because of its proximity and accessibility to Sevier Valley population centers. The Acord Lakes are not a fishery. They usually dry up during late July or August, even during years with average rain and snowfall (fig. 5).

B. CULTURAL ENVIRONMENT AND LAND USE

1. LAND

The proposed mine lies on private lands and on areas administered by the USFS. Mining plans extend into the Fishlake National Forest and are subject to the management direction of the Salina-Fremont Planning Unit (July 1976) of the Richfield District (fig. 2). Management directives include the following: development will meet requirements of other resources or values and will minimize damages; rehabilitation will restore land and vegetation to as near a natural and productive condition as possible; erosion hazards will be minimized; and all evidences of abandoned improvements and most activities will be removed.

The March 1977 Environmental Analysis Report of Energy Reserves Group Inc., proposed Knight Mine Haulage Road, by the Richfield Ranger District, Fishlake National Forest stipulates the following management directives for the proposed and alternate Skumpah mine access road: the proposed access route should utilize the present road directly above and below the dam site as much as possible and is not to encroach upon the stream or marsh area east of the road.

The southern part of the road and a very small part of the portal facilities area would be on land managed by the USFS (figs. 2 & 4). Land management directives from the Salina-Fremont Land Use Plan for the Skumpah Management area advise: restriction of road construction on steep slopes; protection of elk calving areas and critical winter range; and acquisition of lands adjacent to Salina Creek for public recreation. Additionally, the Old Woman Management area plans include: coordination of coal trucking from mines with elk migrations; coordination of coal mining activities and development with big game habitat and the grazing resource; protection of watershed and critical elk winter range; and maintenance of water-quality standards.

Summer homes and summer-home sites occupy part of the surface overlying the proposed mine workings, west, northwest, and southwest of the Acord Lakes (fig. 5). Homesites and areas of land speculation in the Salina Creek drainage are near the proposed surface facilities.

Pursuant to authority granted in chapter 27, Utah Code annotated 1953 as amended, the Sevier County Board of County Commissioners on July 19, 1965, adopted a zoning plan for zoning the unincorporated territory of the county. The Sevier County zoning ordinance permits developing the land for mining. A coal mining permit will be required.

2. RANGE AND TIMBER

Cattle from the Salina Creek allotment graze the Salina Creek bottom (fig. 1) on a deferred rotation system. Approximately 540 cattle graze the unit (including the portal area) for about 10 days, starting June 11 each year, and the unit is occasionally used again in the fall for 2 to 3 weeks for these same cattle. Salina Creek bottomlands are considered fair to good grazing.

Forest/woodland uses include picking pinyon nuts and cutting juniper fenceposts and firewood.

3. SOCIOECONOMICS

Emery and Sevier County residents and businesses--two counties which could substantially increase because of the proposed mine--are currently adjusting to increased urbanization conditions. With urbanization and growth, the larger communities in each county are becoming more cosmopolitan in community and resident lifestyle than surrounding, more rural areas. Salina, in Sevier County, is emerging as a significant urban community on new I-70 (fig. 1). This is described in greater detail in part 1, chapter II.

4. TRANSPORTATION AND UTILITIES

The Skumpah Canyon minesite is connected to I-70 at the Spring Canyon interchange via unimproved Forest Development Road 40009 (Salina Creek road). Also entering the same interchange is a graveled, improved two-lane road to Coastal States' Convulsion Canyon Mine road (FD Road 40010), which also provides access to the Acord Lakes subdivision (fig. 3).

In 1975, an average of 1,795 vehicles per day passed through the Spring Canyon interchange (Exit 72) on I-70), 325 of them heavy trucks (UDOT data).

The Utah Department of Transportation (UDOT) estimates the capacity of the 4-lane sections of I-70 at about 22,000 vehicles per day along the steepest grades, at 14 percent heavy truck traffic.

In 1976, the Convulsion Canyon mine (about 6 miles east of proposed site) reached a production rate of 1.04 million tons per year. The total increase in traffic resulting from this production was about 600 vehicles per day.

Traffic count on the Salina Creek road ranged from 13 to 142 vehicles per day in 1974. During elk hunting season the ADT was 71.2 vehicles, and during the deer hunting season the ADT was more than 130 vehicles (Fishlake National Forest, Traffic count records, 1974).

5. RECREATION

Recreation uses and activities in Salina Creek and near the mouth of Skumpah Canyon (fig. 3) principally involve: (1) driving for pleasure on low standard (less than 12 foot width, with turnouts, and seldom maintained) roads and viewing the natural environment; (2) fishing in upper Salina Creek; (3) hunting small game, game birds, non-game species, and elk, and deer in season; (4) camping and picnicking at undeveloped sites; (5) viewing wildlife; and (6) snowmobiling when snow depths are adequate.

The area is open all year to off-road vehicle (ORV) use. ORV use is controlled through enforcement of Secretary of Agriculture regulation 36CFR 295.6-Operating Conditions at the present time.[1]

Recreation facilities and services have not developed, except for 15 to 20 summer homes near Acord Lakes above the proposed minesite and 3 to 5 summer homes in the valley of Salina Creek north of the mine area (fig. 5). These summer homes and adjacent vacant lots are on private lands within the boundaries of the Fishlake National Forest.

The Salina Creek Road (40009) is used to gain access to higher elevation areas, particularly for fishing, hunting big game, and four-wheel driving on back-country roads. The 1974 traffic count records, see transportation, attest to this use.

6. ARCHEOLOGIC AND HISTORIC VALUES

An intensive archeologic survey was made of the entire project area (Hunt, 9/75), as well as a survey of adjacent areas for possible indirect effects on cultural resources (Lindsay, 9/76). No sites and only a few isolated lithic flakes were found in the project area. The outside check suggested that more extensive aboriginal use may have been made of nearby parts of the Salina Creek drainage, especially to the southwest (fig. 1). Any proposed expansion of the present mine project would need to be carefully checked for cultural resources. The National Register of Historic Places lists no cultural sites for the area.

7. ESTHETICS

The proposed project area is within the Ridges and Valley Landtype Association (Salina Land Use Plan, 7/22/76), which is typified

[1]Fishlake National Forest Travel Plan 8/17/76; pursuant to Presidential Executive Order 11644, dtd 2/8/72 and subsequently Sec. of Agric. Regs. 36 CFR 295.1-5 and 36 CFR 261.70 applicable subparts.

by long, narrow ridges with sparse ground cover and brush-covered side-slopes. Valleys are dominated by big sagebrush, and Pinyon-Juniper is dispersed throughout the area. The landtype has deep soils gullied by excessive runoff. Many of the side slopes are gullied from runoff concentrated on the ridges. Landscape features have some variety in form, line, color, and texture. The combination of these features, however, tends to be common throughout the landtype and is not outstanding in visual quality (fig. 6).

The proposed project area would be seen within half a mile (foreground) from FD Road 40009 (fig. 1). The area is not seen from I-70 in Salina Canyon (fig. 1). At least a quarter and not more than three-quarters of users would have major concerns about modifying the natural scenic quality of the area because of the existing near-natural landscape character.

Present modifications to the natural landscape include: the Salina Creek Road (Forest Development Road 40009) and some spur roads to the proposed minesite (fig. 6); excavations at the minesite; fire and water control structures on Salina Creek; and parts of the Convulsion Canyon (Forest Development Road 40010) road, as viewed in the middleground (0.5 to 3 miles) from the Salina Creek road (fig. 6).

Fishlake National Forest visual management objectives for Federal lands in the Salina Creek drainage (fig. 1) are directed toward retention or partial retention of the natural landscape. Modification and maximum modification of the landscape are acceptable during the life of a project or management activity. However, subsequent reclamation or rehabilitation must be adequate to reestablish the appearance of a natural or near-natural landscape.

C. FUTURE ENVIRONMENT

Directions for land use management included in the Salina-Fremont Planning Unit assign livestock and wildlife range, watershed, and incidental recreation as future intended use of the Federal lands. Other than the possible increase in recreation residences on private surface, little change is anticipated without mining.

CHAPTER III: ENVIRONMENTAL IMPACTS

A. NATURAL ENVIRONMENT

1. LAND

a. Land Surface

Construction and mining at the Skumpah Canyon mine would slightly alter the topography locally (fig. 1, table 1).

Surface expression of subsidence may appear above mine workings across the 6,520 acre lease area (fig. 5). Possible effects are described in part 1, chapter IV. Maximum vertical subsidence if a maximum amount of coal is recovered would probably not exceed 10 feet. This maximum would probably be localized northwest and north of the Acord Lakes, where the Ivie bed is thickest (fig. 5). Over much of the mined area, subsidence would be barely discernible, on the order of 1 foot or less.

Entries and some workings would be driven beneath Skumpah Canyon and the unnamed box canyon a mile to the south (figs. 4 & 5). Thickness of the overburden between the canyon floors and the mine workings would be 450 feet and greater, which interval should be thick enough to prevent undue subsidence of the canyon bottoms and the concomittant risk of flooding the mine workings. However, mining beneath the canyons and near their rims would increase the hazard of rockfalls and landslides. Tensional fracturing caused by subsidence could lead to similar hazards along the rimming cliffs.

b. Paleontology

Impacts to paleontological resources would consist of losses of plant, invertebrate, and vertebrate fossil materials for scientific research, public education (interpretative programs), and to other values. Losses would result from destruction, disturbance or removal of fossil materials as a result of coal mining activities, and unauthorized collection, and vandalism. The extent of impact cannot be assessed because of lack of data.

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.

Because of the present 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

The mining company estimates a 3.5 million ton probable coal resource (2.4 million tons Ivie, 1.1 million tons upper Ivie) on the 120 acres of unleased Federal coal surrounded by the 6,520 acre lease area (figs. 3 & 5). This coal resource could be lost because it is inadequate for a separate mining unit.

If the upper Ivie bed and the coal east of Acord Lakes fault is not mined and the minimum minable bed thickness is held at 5 feet, about 55 million tons of coal would be left within the lease area. Current mining practices in central Utah include mining 4 foot coal and, if employed at this mine, would reduce the coal resource impact.

d. Soils

Construction related to mining would cause surface disturbance and resultant soil impacts on 64 acres of land. Soils affected and their sediment-yield rates on the various landtypes are shown below:

Landtype No.	Landform	Acres disturbed	Est. potential increase in sediment-yield rates when soils are exposed (Cu.yds/Ac/Yr)
8	Wet alluvial lands	13.8	1.1
15	Ridges and complex sideslopes	3.7	4.0
16	Gullied alluvial lands	10.7	1.2
19	Long steep slopes	2.0	4.3
20	Mesa tops and toe-slopes	1.6	1.0
21	Rock-structured canyon walls	3.6	1.0
23	Steep, barren canyon walls	1.1	3.5
26	Dissected fans and toeslopes	27.3	1.5

Based on this information, increased sediment yield rates of less than 1.5 cubic yards per acre per year could be expected on exposed soils on 57.2 acres, and rates in excess of 3.5 cubic yards per acre per year could be expected on 6.8 acres. These erosion rates would apply when the soils are exposed and before installation of erosion control structures, revegetation, or occupancy by permanent facilities (such as buildings or roads). This erosion span could range from a few days to possibly several months. Erosion potentials would decrease as construction is completed and vegetation and erosion control structures are established.

Soil productivity would be lost during the life of the project but would be returned to approximately present productivity after reclamation.

2. WATER

a. Water Supply

Water requirements associated with the mine might amount to as much as 435 acre-feet per year: 80 acre-feet at the mine and for dust suppression, and, as much as, 350 acre-feet to supply the increased population in nearby communities. About half the water used for domestic purposes (175 acre-feet) would be discharged as treated sewage water.

1. <u>Surface Water</u>

Subsidence and subsequent cracking of the mine overburden may cause some surface water to be diverted into the ground more readily than usual, but the quantity cannot be predicted from available data. Depletion of surface water supplies on or near the lease area, may be detrimental to the wildlife and livestock that normally use that water. Water diverted into the ground would probably be discharged elsewhere, but potential points of discharge cannot be predicted from available data.

The flow of Salina Creek (fig. 1) may be increased during the life of the mine, perhaps as much as 20 percent during low flow periods by water pumped from the mine. Mine discharge may contain as much as 500 mg/L dissolved solids which could increase the concentration of dissolved solids in Salina Creek as much as 10 percent.

2. <u>Ground Water</u>

The proposed mine will lie below the portal elevation of 7,080± feet and largely or entirely below the water table. Consequently, the entry adit should intercept water in the Blackhawk Formation a short distance below the surface, and the mine will be wet. Mine dewatering would cause drawdown of water levels above the mine as much as 100 feet, perhaps more. As a result, springs and the present artesian well could stop flowing. Local water gradients may be reversed, possibly causing water from Skumpah and Salina Creeks to flow into the mine tending to diminish streamflow. Flow from the stream to the mine that is being dewatered could be as much as 180 acre-feet per year, or 0.25 cfs, per mile of stream if the overburden is dewatered. Dewatering of the mine would return this water to Salina Creek (fig. 1), causing possible net net increase in the flow of Salina Creek downstream.

As mining expands, the area of water level declines would also expand. The ground-water divide might then migrate eastward, increasing recharge of Skumpah drainage at the expense of Convulsion Canyon drainage (fig. 1).

3. AIR

Air quality standards will not be exceeded, unless the TSP from truck and auto traffic dust or coal particulates at coal handling sites exceeds 250 tons per year. Even the Federal secondary NAAQS standard of 150 $\mu g/m^3$ for 24-hour TSP concentrations, which does not apply here, could only be exceeded near the main haul road. Because of the large size of particules, most would settle out within short distances (the first mile or less) downwind. Using the analysis of AeroVironment (1977) for an estimated 24-hour maximum concentration of TSP associated with an unpaved road network and relating the calculated concentrations to the estimated daily one-way traffic of 350 haul and supply trucks and 290 cars, it is estimated that concentrations as high as 230 $\mu g/m^3$ above background levels could occur within 330 feet (100 m) of the road. In calculating the 230 $\mu g/m^3$ value, a 50 percent reduction in emissions due to watering was assumed.

Paving, or treatment with chemical stabilizers, which approximate paving, could reduce fugitive dust emissions from roads by an additional 70 percent over watering alone (ERT, 1978). In lieu of paving or chemical stabilization, control of vehicular speeds would reduce fugitive dust emissions from travel on unpaved roads.

Visibility would be significantly impaired in the immediate vicinity of the road from associated truck haulage of coal and auto traffic. The impact would be short term in duration, being confined mainly to periods of heavy traffic.

4. VEGETATION

The only serious impacts to vegetation would be caused by constructing the portal facilities, access road, and powerline. Approximately 64 acres of vegetation would be destroyed in the Sagebrush-Grass and Pinyon-Juniper Woodland types. Very minor impact is foreseen upon the vegetation overlying the mine itself.

No threatened or endangered plants would be impacted by the proposal.

5. WILDLIFE AND FISHERIES

Constructing the mine and ancillary facilities and upgrading 2.7 miles of road would eliminate deer use on 64 acres of deer winter range for the life of the mine. Data on carrying capacity of winter range on unit 43 are not available; however, based on carrying capacity winter range on unit 43 are not available; however, based on carrying capacity of adjacent unit 36 with similar vegetation types and plant density, loss of this range would reduce the deer population potential by 11 deer. In addition, disturbance and human activity due to mining could reduce deer use by 50 percent on 566 acres of winter range (0.3 percent of the total deer winter range on the unit). This change in range use would reduce the deer population potential by 36 deer. The total reduction in deer population potential could be 47 deer.

Disturbance up to half a mile from the proposed mining operation would displace elk use and eliminate approximately 250 acres of elk winter range for the life of the mine. According to the Utah Division of Wildlife Resources (UDWR), elk are not presently using this area (oral commun., Bud Camp, 1977). Use during a severe winter or changing use patterns due to disturbance caused by other developments have not been documented; therefore, the impact from loss of future use of this potential elk winter range cannot be determined.

Added traffic volume would increase deer mortality from vehicle strikes. Based on the present rates of mortality and traffic volume, deer highway mortality would increase by 44 deer annually. In addition, losses due to fences along I-70 could increase as migrating deer are forced to cross fences several times to avoid traffic disturbance. Data on losses from fences are not available; therefore the amount cannot be predicted.

Loss of other wildlife species due to vehicle strikes would also increase with added traffic. Scavengers and carrion eaters attracted to roadways by carcasses of road-killed wildlife would also suffer greater losses from vehicle strikes. Data on these losses are also not available; therefore the amount cannot be predicted.

The reduction in deer population potential and the disturbance caused by mining could reduce the mountain lion population potential on deer herd unit 43 by three animals. Based on home range size, intraspecific interaction, availability of prey, and topography (Seidensticker and others, 1973), the proposed development would encroach upon the home range of three lions. This impact would continue for the life of the mine.

The presence of the mine and occupation of habitat in the mountain brush and riparian zones would impact black bear populations during periods of low food supply at higher elevations. The area of the proposed minesite and adjacent riparian habitat in Skumpah and Salina Creek drainages may be included in the yearly home range of one bear. The number of bear that would be affected during the life of the mine cannot be predicted.

Constructing and maintaining approximately 8 miles of powerline from Convulsion Canyon to the proposed minesite would disturb wildlife and their habitat and introduce an additional flight hazard to birds (fig. 1). Death or injury from wire strikes would increase; however, the amount cannot be predicted. The proposed powerline would follow along present roads for about 6 miles. This would reduce habitat disturbance, but would increase the exposure of birds on power poles to shooting (Ellis and others, 1969). The amount of loss from such shooting cannot be predicted.

The increased traffic, fugitive dust, and possible minor decrease in water quality of Salina Creek caused by mining would reduce the quality of 2.7 miles of roadside riparian habitat for some birds, beaver, aquatic insects, and trout. The extent of this reduction cannot be quantified, but it would continue for the life of the mine.

Any diversion of flow in Salina Creek or its tributaries due to subsidence would reduce the quality of the fishery in Salina Creek below the mine area (fig. 1). Data are not available on the possible amount of diversion; therefore, the adverse impact on the fishery cannot be quantified. Possible drawdown or drainage of the Acord Lakes from subsidence could reduce or eliminate resting and feeding habitat for spring migrating waterfowl and shore birds. No inventory of numbers using the area has been made; consequently, the number that would be affected is not known.

The increased population resulting from constructing and operating the proposed mine would result in increased disturbance of wildlife in more areas of their habitat. Increased legal and illegal hunting and fishing, ORV use, pleasure driving, camping, and hiking would displace some wildlife species from part of their present habitat. This disturbance and displacement would reduce the productivity of affected species by an unknown amount.

If all permanent employees associated with the mine required new housing, approximately 100 acres of pheasant habitat on agricultural lands in Sevier Valley (about 20 miles west) and Castle Valley (about 15 miles east) would be lost to urbanization. Loss of this habitat would reduce pheasant numbers by approximately 10 hens, 4 cocks, and 45 young annually. This reduction is based on a spring nesting population of 10 hens per 100 acres, a 5.4 hens-to-cock ratio and an average brood size of 4.7 chicks per hen. Increased fishing pressure would deplete natural populations in streams not presently artificially stocked and would reduce the present catch rate on waters stocked by the Utah Division of Wildlife Resources.

B. CULTURAL ENVIRONMENT AND LAND USE

1. RANGE AND TIMBER

The vegetation destroyed by the project would reduce the grazing capacity by approximately 5 AUM's. The access road causes more concern. Truck traffic on the access road could prevent cattle from passing through the narrows in the lower end of the canyon, reduce their access to the usable forage areas, and kill or injure them (fig. 1).

2. SOCIOECONOMICS

The effect of the proposed mine would be the addition of about 1,800 new residents to Emery and Sevier Counties, or about 10 percent of the increased population of the projected level discussed in part 1.

Greatest impacts on man and his environment would result from increased urbanization associated with mine development. Urbanization would include need for an construction of additional permanent or mobile housing, schools, and community service facilities. The form of community service would change. There would be an increase in taxation and bonding of local residents (or County or Statewide residents) to construct, operate, and maintain sewers, water systems, streets, garbage collection, police, fire, and public health services. Lifestyles would become more cosmopolitan, probably different from the present-day rural, family oriented, and religious lifestyles characteristic of the area.

Higher incomes would probably increase the tax base, and would be beneficial to Emery and Sevier County economy. Effects of the new payroll are discussed in part 1, chapter IV.

3. TRANSPORTATION AND UTILITIES

Environmental impacts would result from upgrading 2.7 miles of road and constructing about 0.3 mile of new road and bridging Salina Creek (figs. 1, 4).

Traffic to the mine would come through the Spring Canyon interchange (exit 72) from I-70 (fig. 1). Daily traffic would include 350 heavy truck passages plus 290 commuter vehicles for a total of 640 vehicles. Average traffic on I-70 at the Spring Canyon interchange would nearly reach 3,000 vehicles per day, an increase of about 70 percent in total traffic. Over 950 would be heavy trucks, which is nearly three times the current number. About half the increase could be attributed to the Skumpah Canyon development. Even though heavy trucks are considered to be equivalent to 4 to 13 automobiles (considering grade and direction), the increased traffic from the Skumpah Canyon mine would not seriously affect the traffic-carrying capacity of I-70.

The probability of increased traffic accidents from this and other mine outputs is discussed in part 1, chapter IV.

Subsidence resulting from mining could affect some roads above the proposed mine, including part of the Convulsion Canyon mine (Acord Lakes) access road (fig. 1). More precise locations and quantification are not possible.

The nearly 3 miles of improved access road would improve access to grazing and recreation areas to the north. The present interchange onto I-70 and improvement of access might improve the desirability of the area for future residential or other development.

About 8 miles of powerline would be built over the plateau from the present Convulsion Canyon mine, with consequent clearing of about 10 acres of right-of-way and the development of necessary access (fig. 1, table 1).

4. ARCHEOLOGIC AND HISTORIC VALUES

No sites were found during recent cultural resource surveys. Sites may be found during intensive surveys that will be conducted prior to construction of roads, powerlines, and other offsite facilities. Until such a survey is completed the extent of the impact cannot be determined. Increased population due to mining may result in more vandalism of cultural resources in the region. Surveys will add to the cultural resource knowledge of the region.

5. RECREATION AND ESTHETICS

Use of the recreation potential in Salina Creek could be expected to increase by as much as 20 percent as a result of improved access (fig. 3). Increased hunting and fishing pressures, along with habitat disturbance, road kills, and site occupancy, could reduce game numbers in herd units 14 (elk) and 43 (deer) and fish populations in Salina Creek (figs. II-2, part 1, chapter II). This could result in a lowering of hunter success as much as 5 percent for deer and 2.5 percent for elk) and fisherman (not quantifiable) success during the life of the proposed project.

The opportunity to view wildlife and enjoy the natural environment onsite would be reduced at the beginning of construction and would continue to be reduced through reclamation. Safety hazards and minor conflicts of use could be created by mixing recreation and mining traffic on the Salina Creek road, primarily from I-70 to the minesite (fig. 3). The effects should not extend significantly, however, upcanyon in Salina Creek beyond the improved access.

Implementing the proposal would introduce several industrial modifications in an area where few now exist. Although all facilities and activities would be located in the foreground viewing zone from the Salina Creek road, they would be limited to the lower 2.7 miles in the Salina Creek drainage (fig. 1). Dust, noise, and industrial activities (see Air Quality Section) adjacent to or downcanyon from the minesite, would diminish the natural esthetic character of the area to some extent.

CHAPTER IV: MITIGATING MEASURES

The legally enforceable mitigating measures are given in chapter I-D.

Other mitigations are included, along with project alternatives, in chapter VIII.

Some general mitigating measures are discussed in part 1, chapter IV.

CHAPTER V: ADVERSE EFFECTS THAT CANNOT BE AVOIDED

A. NATURAL ENVIRONMENT

Ground subsidence, with its attending slight fracturing and bulging at the surface, and some minor rock slides and rockfalls along canyon rims, would still occur despite mitigating measures.

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.

Possible unavoidable adverse effects upon underground coal mining and production are summarized in part 1, chapter V.

As much as 55 million tons of coal may be unrecoverable, and left in the ground, and probably lost to ultimate future recovery.

Soils would be disturbed on 64 acres, resulting in physical and chemical alterations and some increased erosion. Erosion would be expected to increase by 1.0 to 1.5 cubic yards per acre per year on 57 acres and 3.5 to 4.3 cubic yards per acre year on 8 acres, when the soils are exposed. Little of the eroded material would leave the disturbed site.

Mining would require about 80 acre-feet of water per year. Domestic water needs would increase by as much as 350 acre-feet per year, and sewage would increase by as much as 175 acre-feet per year. Dependent on the source of water for domestic needs, spring and streamflow could diminish and perhaps adversely affect downstream uses for irrigation, fish, and wildlife. Dewatering for mining would cause water level declines and possibly decrease spring flow.

The presence of subsidence fractures could increase groundwater recharge. Fracturing could change ground-water flow patterns causing some springs to disappear and new ones to appear elsewhere. Some streamflow could be directed into the ground or into the mine.

Assuming paving or chemical stabilization would reduce fugitive dust by an additional 70 percent over watering alone, the 24-hour maximum incremental increase in TSP would be approximately 70 $\mu g/m^3$, which when added to air estimated 20 $\mu g/m^3$ background would be significantly below the NAAQS secondary standard.

Vegetation would be removed from 64 acres in building the portal and service facilities (fig. 4). This will result in a loss of 5 AUM's per year of grazing capacity. The normal grazing patterns of cattle would be disrupted to some extent.

Loss of wildlife habitat occupied by surface facilities would be unavoidable for the life of the mine. Any loss of wildlife or wildlife productivity due to displacement, disturbance, loss of habitat, illegal shooting, or vehicle and wire strikes would be unavoidable.

B. CULTURAL ENVIRONMENT AND LAND USE

Major adverse socioeconomic impacts that cannot be avoided are associated with lifestyles and subcultural values, which are typically not mitigated by monetary assistance for local construction, operation, and maintenance of public services.

Unavoidable adverse impacts would result from road upgrading and construction and from bridge and powerline construction. Traffic on the present public road between Skumpah Canyon and the Spring Creek interchange would increase from a normally negligible figure to about 640 vehicles per day. The same figure would be added to the traffic now passing through the Spring Creek interchange to I-70, increasing both the traffic on I-70 and the hazards at the interchange (figs. 1, 4).

Even with proper design, location, and screening of structures, reconstructing the haul road away from Salina Creek, and other proposed mitigating measures, the natural undeveloped character of lower Salina Creek would be lost during the life of the mine. Increased use of I-70 as a major coal route could create adverse impacts on the use and enjoyment of this section of I-70 for through-traffic use and viewing in Salina Canyon.

The visual character of the landscape in lower Salina Creek would be modified from natural to industrial during the life of the mine.

Loss of hunting and fishing success during the life of the mine would be unavoidable.

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.

CHAPTER VI: SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Mining is occurring on adjacent lands; therefore, other than increasing regional coal production, little effect or change is anticipated by opening this area to mining.

Short-term surface disturbance caused by construction will be largely obliterated in the long term, after reclamation. Subsidence would continue to alter the land surface above the mine to an unknown degree for perhaps 3 years after the mine closes, but is not expected to be a serious long-term problem.

Implementation of the mine proposal would impact an undetermined number of uninventoried exposed and unexposed fossil localities, and result in an unknown gain in knowledge of paleontological resources because of exposure which might never have occurred without excavation.

The development of and production from the proposed mine is considered to be short term. The purpose of the mine is to provide a short-term supply of low-sulfur bituminous coal for generating electricity and perhaps other uses. The use and commitment of about 90 million tons of coal (35 million mined; as much as 55 million left in place) involves a trade-off between coal and other energy sources.

Disturbed soils would be taken out of vegetative production on 64 acres during the short term. Long-term effects on soil productivity would be negligible, as disturbed areas would be reclaimed after mining ceases.

Ground-water levels would be lowered, and flows in Salina Creek and Skumpah and Convulsion Canyons may be reduced during the life of the mine owing to drainage into mined-out areas. After mining ceases, ground-water levels should eventually recover to about pre-mining levels. However, because of the increased porosity and permeability of mined-out rooms and caved overburden, the water table could adjust to a new level below its pre-mining level. Eventually, at the expense of surface runoff, increased recharge and ground-water storage would build up the water table, thereby increasing baseflow to streams in the long term.

In the short term, vegetation, including the associated range forage, would be lost. In the long term, after reclamation, these areas should be as productive as they are now.

Loss of deer and elk from reduction of habitat; losses to fences, illegal shooting, and vehicle strikes; and displacement from habitat would affect the short-term productivity of the herds. Loss of pheasant habitat from urbanization would reduce their long-term productivity in Sevier (about 20 miles west) and Castle Valley (about 15 miles east). Degradation of fishery habitat and increased fishing pressure on Salina Creek would reduce long-term productivity of present trout species, and could change species composition.

The community and county tax base and family incomes would increase during the life of the mine. Rural economic programs could decrease during this time, especially the number of residents directly employed full time in agriculture.

It is conceivable that when the mine eventually closes or if it suffers a major setback (after operation begins), nearby communities could suffer a depression.

The mine access road and the I-70 interchange would probably remain after mining ceases, partly because of other mines in the area Thus, their effects are likely to be long term.

The use of the proposed powerline after the mine is closed would depend on other development in the area during the life of the mine. If there were none, under current practice the line would be salvaged and the right-of-way allowed to revert to its natural state.

Short-term use of the lease areas for mining would modify the natural landscape of lower Salina Creek. It would also introduce conflicts between recreation use and mining traffic during the life of the mine. The improved access road would remain in place, and some would still be evident after mining and reclamation. However, recreation use would not increase appreciably, and the esthetic resource would not be significantly altered from that at the present time, on a long-term basis.

Any archeological sites disturbed during development of the site would result in a long-term impact to the inplace value of that site. Collection of sites that might be found will insure recording of information that could otherwise be lost to natural forces or vandalism.

CHAPTER VII: IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Subsidence would represent a slight but irreversible change in the topography above the mine workings.

The 55 million tons (or perhaps less) of low-sulfur coal left in the ground could represent an irretrievable commitment of the coal resource.

Impacts might occur to an undetermined number of uninventoried exposed and unexposed fossil localities.

Earth materials used for construction and machinery would be, to a large extent, irretrievable, and all energy fuels consumed during construction, mining, transportation, and reclamation would be irretrievable.

Although the disturbed soils would be reclaimed after mining, the original natural soils conditions would not be attained. Soil amendments and energy expended to rebuild the soil to its approximate original condition would be considered irretrievable. Any loss of soil by erosion, as a result of the project, would also be irretrievable.

The 80 acre-feet of water per year needed for mining coal and dust suppression would be irretrievable. In addition, about 350 acre-feet of water per year would be required for domestic purposes, of which about 50 percent would be consumptively used and 50 percent returned as sewage.

Increased porosity, permeability, and water storage of fractured overburden and mined-out areas would be irreversible.

The termination of coal mining operations would lead to a termination of pollutant emissions and the air resource would not be irreversibly committed. Emissions from secondary growth and related activity such as traffic, urban fuel consumption, etc., induced by the proposed action would be more permanent in nature and result in a long-term commitment of the air resource to some deterioration.

The vegetation, including associated range forage, would be irretrievably lost for the life of the project. This loss would amount to 5 AUM's per year for 45 years, for a total of more than 225 AUM's.

Lost production due to occupation of habitat by mine facilities or displacement of wildlife would be irretrievable. Wildlife lost due to vehicle strikes, fences, illegal shooting, or wire strikes would be irretrievable. Loss of pheasant habitat due to urbanization of agricultural areas would be irreversible. Diversion of streamflow in Salina Creek due to subsidence and the resultant reduction in the quality of habitat for fish would be irreversible.

Irreversible and irretrievable commitments of resources in the transportation sector would include the materials used in constructing roads and a bridge (fig. 4), water used in wetting the roads, the effective lives of vehicles used to haul coal and supplies and for miners' commuting, and vehicle fuel and supplies. These latter items are not negligible. If all the coal were hauled to a siding at Salina, 24 road miles from the mine portal (fig. 1), over the life of the mine more than 200 trucks would have accumulated about 67 million vehicle - miles and about 17 million gallons of diesel fuel would have been consumed. During the same period, miners commuting from the same general area would have traveled 67 million vehicle-miles and 2.7 million gallons of gasoline would have been consumed. The basis for these figures is given in part 1, chapter VII.

The area would be irreversibly committed to minimal increases in recreation uses if improved access remains in place after mining and reclamation.

The landscape would be irretrievably changed, and the visual perspective would be irreversibly committed to include the improved road access and small amounts of mining remnants resulting from the proposed mining.

The loss in hunter and fisherman success during the life of the mine would be irretrievable.

The cultural resources in the immediate project area could not be preserved in place.

CHAPTER VIII: ALTERNATIVES

The general administrative options available to the Secretary of the Interior are discussed in the regional EIS, part 1, chapter VIII. Detailed administrative alternatives are listed below.

A. NO ACTION

Pursuant to implied covenants of both the Federal mineral leasing laws and the existing lease agreements, the Secretary is obligated to respond to a legitimate application to conduct mining operations on a valid lease, provided that all terms and conditions thereunder have been met. His response may be approval as proposed, rejection on various legitimate grounds, approval in part and rejection in part, or approval subject to such additional conditions and requirements or modifications as he may impose under the laws. He may also defer decision, based on proper grounds, as described elsewhere in this chapter.

"No action" on proposals for continuation of approved ongoing mining operations would equate to closing down existing operations; under existing regulations, operations may not proceed in the absence of approved mining plans and related permits. The impacts of taking no actions in such cases would be approximately the same as those described under the following subsection C (2), "Cancel the lease."

"No action" on mining proposals for the initial development of the existing lease would equate to maintaining the status quo on that lease. The impacts of taking no action in this case would be the same as described subsequently under subsection C, "Prevent further development on the existing lease."

The coal would not be mined, and the impacts discussed in earlier chapters would not occur. If the coal were not mined, the environment above the minesite would be altered by 1990 through the addition of an unknown number of summer homes and roads leading to those homes. There would be more pressure, particularly upon soils, water resources, vegetation, wildlife, and esthetics, owing to the activity of the increased population and to the greater availability of access routes to this population and to transient visitors. Some of these increased pressures would probably spill over into the proposed portal area, and alter the environment there to a similar, albeit lesser, degree. Implications for the national economy of this alternative are discussed in chapter VIII of the regional EIS, part 1.

B. DEFER ACTION

For proper cause, the Secretary may defer final action on a proposed mining and reclamation plan. These could include, but are not limited to, the need and time required for:

1. Modification of the proposal to correct administrative or technologic deficiencies.

2. Redesign to reduce or avoid environmental impact.

3. Acquisitions of additional data to provide an improved basis for technical or environmental evaluation.

4. Further evaluation of the proposal and (or) alternatives.

The principal effect of deferring action on a proposed mining and reclamation plan on these grounds would be a comparatively short-term delay in the imposition of all related impacts of the proposal as previously described in the unavoidable adverse impacts section of this statement.

Once a mining and reclamation plan is approved, the regulations and lease terms require that all subsequently proposed departures and deviations therefrom be approved in advance by the USGS. The regulations (30 CFR 211) also permit the USGS to direct that changes be made in previously approved operations. For example, changes could be ordered to accommodate new, improved, or revised administrative requirements, technologic improvements, environmental concerns or requirements, or revisions of prior evaluations thereof in the light of experience or previously unknown factors.

Mining would be deferred to a later date. The impacts upon the environment would be essentially as described, but would occur at some future time. A deferral until underground mining technology is improved would probably result in a more favorable extraction rate.

C. PREVENT FURTHER DEVELOPMENT ON THE EXISTING LEASE

The only alternatives to allowing development of existing leases is to prevent such development or to impose additional conditions and restrictions on the operations. The several apparent means of preventing full development are discussed below.

If prevention of further development of the 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, other comparable quantities of coal or sources of energy would be required to meet national needs. The development of other sources and related impacts is discussed later.

1. SUSPEND OPERATIONS

The full development of the existing lease 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, and future suspensions of operations for reasonable periods, with proper grounds, could be imposed. The Secretary cannot, under present circumstances, suspend operations to the extent that a de facto 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 operations pending legislation remains available. Impacts of this alternative would be similar to those described in subsection C (2), "Cancel the lease."

2. CANCEL THE LEASE (NO NEW DEVELOPMENT)

The Secretary does not possess authority to unilaterally cancel the lease except on the ground defined therein (section 7 or 8 of the lease terms--"Proceedings in case of default"). The authority to cancel on other grounds would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees as may be necessary. The Administration has not entered a request for such legislation, and the Congress has not initiated such action in 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 non-environmental concerns.

Present production could be interrupted temporarily or terminated completely, as could further development of the existing lease.

To the extent that coal production from the existing lease was curtailed or halted, alternative sources of energy would be required to meet present needs and demands. These could be foreign and (or) domestic and are discussed in later pages. The time required to replace the resource foregone could range from scant to a number of years, depending on the specific alternative(s) selected and its state of production.

Environmental impacts of the proposals could range widely, depending on the administrative action taken on the existing lease. If this lease were cancelled through Congressional authorization, proposed mines would be avoided. Conversely, should development eventually be authorized, environmental impacts as discussed in the impact chapter would occur. The net result would be a deferral and perhaps reduction of impacts through changed technology or requirements imposed at that time.

3. FEDERAL ACQUISITION OF THE LEASE

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 lease as previously discussed under subsection C (2).

4. REJECT THE MINING AND RECLAMATION PLANS

Rejection of the proposed mining and reclamation plans would result in no environmental impact on the leased lands, and they would continue in their present condition, subject to modification by natural process and by the condition of other existing activity and uses--and to further modification by the surface owner to meet other uses.

The Secretary may reject any individual proposed activity 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 designed course of action by the lessee (operator). 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 Congress. Viability of this option is dependent upon timely legislative action; the option of rejecting the proposed plans pending legislation remains available. Impacts of this alternative would be similar to those described under subsection C (2), "Cancel the lease."

D. RESTRICT DEVELOPMENT ON THE EXISTING LEASES

The subject lease conveys the right to develop, produce, and market the Federal coal resource thereof if all other terms and conditions have been met by the lessee. In general, the Secretary does not possess the authority to arbitrarily constrict development. 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.

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.

E. APPROVE THE MINING PLAN AFTER MODIFICATION

A number of the impacts identified and described in chapter III of this statement could be more fully mitigated by the selective application of those measures described that are supplemental to the proposals of Energy Reserves Group, Inc., by implementation of one or more of the alternatives described below. In addition, special conditions could be added to the approved plans relating to the secondary effects of the mining. Such conditions must be reasonable and, if unacceptable to the lessee, could result in the lessee not developing the lease areas with the resultant impacts previously discussed under subsection C (4) "Reject the mining and reclamation plans."

1. COMPANY-PROPOSED ALTERNATIVES

a. Alternate Road Location

Description of the alternative.--In the event that part of Salina Valley, between Dam No. 4 and the gaging station, would be flooded to form a reservoir for the proposed Axtell powerplant, an alternate haulage road will be considered (fig. 1).

The alternate road would lie east of Salina Creek and would join the lower part of the Convulsion Canyon road; it would be 2.4 miles long, or 1.3 miles shorter than the present and proposed roads combined. Area of expected surface disturbance is 11.5 acres (table 4). The route lies on National Forest land and on land owned by the proponent. Upon termination of mining, the road would be reclaimed.

The alternate road would cross slightly steeper but much more dissected terrain than the present forest development road and the proposed spur road. It would, therefore, require more culverts, and disturb more surface than upgrading the present road and constructing the spur to the mine portal would. The alternate road would, however, eliminate the need for a new bridge across Salina Creek (fig. 1).

Topography and geology.--The land surface slopes gently to moderately westward toward Salina Creek and is dissected by numerous gullies and minor tributaries to that stream. Altitudes along the alternate route lie between 7,040 and 7,240 feet (fig. 1).

The route would lie near and roughly parallel to the apparent east side of the Musinia fault zone (Doelling, 1972) and would probably cross the boundary fault several times (fig. 5). The Blackhawk Formation is exposed in the east block, and the North Horn Formation and some overlying colluvium and pediment sediments are exposed in the west block. Locally, bedrock along the fault can be expected to be broken, unstable, and probably wet.

Table 4.--Summary of data for alternatives

Alternative

Access road--Alternate route, from Convulsion Canyon road to mine portal site, 2.4 mi. x 40 ft.
Area in acres ----- 11.5

Power line-- Alternate route, from Convulsion Canyon to mine portal site, 6.35 mi., at 1.3 acre/mi.
Area in acres ----- 8.3

2 mty production rate--Total production and recovery rate, unchanged.
Full production to begin in 44th month.
Life of mine, about 20 years.
Construction personnel, unchanged.
Production personnel, 377 (more realistically, about 580).
Power requirements, may be double.
Water consumption, may be double.
Consumption of limestone and of mine timber, somewhat higher, to an unspecified degree.
Mine and rock-waste production, unchanged or slightly higher.
Sanitary waste production, increased.

Because the terrain is dissected, numerous culverts would be required. Constructing these culverts would temporarily increase sediment load to Salina Creek (fig. 1). The adverse foundation conditions that may be encountered during road construction along and through faults could result in increased surface disturbance should the road be relocated laterally to avoid unstable or wet zones. Shoring the roadbed may also be required, causing additional surface disturbance. More surface than normally required for a 40-foot-wide road may be unavoidably disturbed.

Soils.--If the alternate route were used, it would damage more soil, because slopes are steep and soils are unstable, than if the present route were upgraded. Although it would be shorter than the primary route, it would disturb new land, and more soil would be eroded. Soils along the alternate route are less productive, however, than those along the proposed route in the valley, so using the alternate route would conserve potential production.

Water.--Because it is shorter, the alternate haul road would require about 10 percent less water for dust suppression.

Air.--The incremental suspended particulate increases, as described in chapter III, would be the same, but the background level would be higher, because the Convulsion Canyon road is being used for truck haulage of coal and commuter auto traffic for the Coastal States mine resulting in higher total TSP concentration near the roads. The Federal primary standards could periodically be exceeded. This alternative would be subject to PSD permit review by EPA, which would include an assessment of best available control technology (BACT). Such an assessment could include chemical stabilization or paving of roads which would reduce particulate suspension significantly.

Vegetation.--The alternate haul road would reduce the impact of grazing by 4 AUM's per year. However, a new road would increase the impact upon vegetation.

Wildlife.--The alternate haul road would occupy approximately 29 acres of deer winter range for the life of the mine. This range would support five deer each winter. If the road were to be left after mining, 29 acres of deer winter range would be eliminated over the long term. Traffic disturbance on the haul road would reduce deer use by 50 percent on approximately 300 acres adjacent to the roadway, reducing the population potential by 27 deer annually. The total reduction in population potential would be 32 deer. This impact would continue for the life of the mine.

Transportation, recreation, and esthetics.--The alternate road would join the Convulsion Canyon road to the east of the present recreation use areas in the Salina Creek drainage (fig. 1).

Building the alternate would minimize conflicts between recreation users and mining activities to a great extent. It would also alleviate hazards between the several users and be less impactive on fisheries, deer and elk migration routes, and big game winter range areas.

The alternate road could be designated for use by mining personnel and mining operations only. This would reduce the need for realining and upgrading the present Salina Creek road (fig. 1). It would also result in only a minimal increase in traffic on the present low standard Forest Development Road 40009 and also only a minimal increase on the subsequent impact on hunting and fishing pressure in the headwaters of Salina Creek.

If the alternate road were to be constructed, natural contours and topographic features could be used to mitigate visual impacts. In addition, maintaining native vegetation and avoiding straight-line construction and extreme cuts and fills would also minimize visual impacts.

b. Alternate Powerline Location

Description of the alternative.--An alternate power transmission route has been proposed. The first 3.35 miles would also proceed westward up Convulsion Canyon to northwest of the Acord Lakes. From that point, it would take a more nearly direct, westerly, cross-country route, 2.65 miles long, to the cliff above and east of the portal facilities. The final and westernmost 0.35 mile would be the same as the primary route. The total length of the more direct alternate route would be 6.35 miles, or 1.65 miles shorter. Area of expected surface disturbance is 8 acres (table 4). In addition, about 1 1/2 miles of new roads would have to be built for constructing and maintaining the line, disturbing about 2 acres more.

Topography and geology.--Constructing the alternate powerline, which avoids most of Skumpah Canyon, would reduce the hazard of rockfalls and slides to some degree. However, it would require perhaps 1 1/2 miles of new roads, which would negate much of the lessened amount of surface disturbance expected in building a shorter line. The surface disturbance resulting from construction of new access roads would be unavoidable.

Vegetation.--The alternate route would reduce the impact upon vegetation to a minor extent, but neither route is expected to impact vegetation significantly.

Wildlife.--The alternate powerline route would disturb 8.3 acres of wildlife habitat during construction; however, the area occupied would be smaller once the line was in place. Part of the route is along present roads and some illegal shooting of raptors may result. Some birds would be killed by wire strikes. Losses from shooting and wire strikes would be unavoidable, but they would not significantly affect long-term productivity of species involved. Impacts would contine for the life of the mine.

c. Increased Production Rate

Description of the alternative.--If near-future market conditions allow, the proponent might produce as much as 2 mty from the mine (table 4).

Under this production rate, full production could begin on the 44th month after beginning the project. Total production would remain at 35 million tons. Total life of the mine would be about 20 years. There would be no change in the plans for surface structures and facilities, access road, and power transmission line. Power and water requirements might have to be doubled. All coal would be conveyed through the one proposed inclined main entry.

At full production of 2 mty, the proponent estimates a workforce of 377. Based on existing Utah production data, this report assumes a workforce of 580 is necessary (15 tons per man-shift by 1990).

Topography and geology.--Daily mine-waste production would be increased, twofold, but the total amount of mine-waste rock should remain about the same.

The alternate production rate would, through more rapid extraction, increase the rate of subsidence, but not the maximum vertical amount. As discussed in chapter IV of the regional EIS, part 1, rapid extraction, if carefully controlled through sound mining, can result in more uniform subsidence over the mine workings.

Other impacts to topography and geology and any unavoidable adverse effects upon the land surface and the coal resource would be essentially the same as those expected for the 1 mty extraction rate.

Water.--The water requirements will increase for this alternate, perhaps twofold over that given in chapter I. About 140 acre-feet of water per year would be needed at the mine and as much as 700 acre-feet per year by the increased population. This increase would be unavoidable, and much of the water would be irretrievable.

Air.--Doubling the production rate to 2 mty would doublt incremental increases in TSP along the road. Maximum 24-hour TSP incremental increases along the road could be as high as 460 $\mu g/m^3$ (using the example of AeroVironment, 1977) compared with the Federal primary and secondary standards of 260 and 150 $\mu g/m^3$ for TSP concentrations. The mine and related activities would be subject to PSD permit review by EPA, which would include an assessment of best available control technology (BACT). Control could include paving or chemical stabilization of haul roads which would be the major contribution to the TSP emissions.

Soils and vegetation.--Impacts on soils and vegetation would increase in direct proportion to increase in acreage of surface facilities.

Wildlife.--Impacts to wildlife from the alternate production rate would be similar to those described for the proposed action except that duration would be reduced from perhaps as long as 40 years to about 20 years. The impacts caused by human disturbance and legal and illegal hunting and fishing would be more intense. The area disturbed or occupied would remain the same.

The larger mining force that would be required might result in increased urbanization in Castle Valley (about 15 miles east) or Sevier Valley (about 20 miles west) and possible loss of approximately 200 acres of pheasant habitat. If this habitat is lost pheasant numbers would be reduced by 24 hens, 9 cocks, and 108 young annually. This reduction would be unavoidable and would reduce long-term productivity of pheasants in the area. If houses and community facilities remained after the life of the mine, it would result in an irreversible commitment of pheasant habitat.

The increased traffic due to the larger number of miners and coal haul trips would result in a greater annual highway deer kill. However, as the mining period would be only about half that of the proposed action the total kill may be the same. The kill loss would continue for the life of the mine. Wildlife killed by vehicle strikes would be unavoidable; however, long-term productivity of the species involved would not be significantly affected.

Socioeconomics.--The workforce of 580 employees could attract an associated of 3,550 new residents. Impacts would be substantial. Because Sevier County tends to have a low population density and communities are small and based on a rural economy, impacts would be significant. Impacts would affect rural lifestyles and subcultural religious lifestyles and effect problems of urbanization.

If 2 million tons of coal is mined each year, the life of the mine would be shortened, which would affect the types of homes and businesses established, the types and limitations of loans granted to local communities, and the local mortgage market.

Transportation and utilities.--Doubling the output of the Skumpah Canyon mine would essentially double the traffic to and from it, to perhaps 725 truck passages per day and 600 passages by lighter vehicles. A two-lane paved access road would be advisable, as a practical limit for gravel roads is roughly 500 vehicles per day (vpd) due to maintenance costs. Traffic on I-70 in Salina Canyon could increase from 2,350 vpd (this includes Coastal States' 1976 traffic) to 3,680 vpd, of which 35 percent would be heavy trucks. The traffic would be within the carrying capacity of the Spring Creek interchange and I-70 through Salina Canyon (fig. 1).

Powerlines would require the same right-of-way as before, with the same environmental effects.

2. OTHER MITIGATING MEASURES

Mitigating measures proposed by the company are given in chapter I-C. Legally enforceable mitigating measures are given in chapter I-D.

Some other and more general measures are given in chapters I and VIII of the regional EIS, part 1. These measures would partly but not completely mitigate the impacts described in chapter III.

Other mitigating measures applicable to the proposed action and which should be implemented where feasible include:

1. Loss of the unmined coal resource could be partly mitigated, as indicated in chapter III by:

a. Mining coal beds as thin as 4 feet.

b. Mining a part of the Upper Ivie bed, in conjunction with or before mining the Ivie bed.

c. Mining the block east of the Acord Lakes fault.

It is not known whether any or all of the above measures are economically or technically feasible.

2. Vehicle-wildlife strikes would be reduced somewhat by eliminating an 8 to 10 foot-wide strip of vegetation on either side and immediately adjacent to roadways.

3. If fencing along roadways would become necessary, it should be constructed according to specifications to avoid deer and (or) elk entrapment.

4. If so requested by the USGS, the company would cooperate in establishing a network of survey monuments on the lease, before mining. These monuments would be used to monitor subsidence during and after mining.

5. Subsidence-monitoring instruments should be installed to measure level changes in the Acord Lakes and Skumpah Canyon and Reservoir (fig. 5).

6. Future test holes should be cased to monitor ground-water levels and to sample for water quality (chapter I-D). Where the mine intercepts substantial quantities of ground water measures should be taken to avoid deterioration of its chemical quality.

7. Socioeconomic impacts identified in chapter III may be mitigated to some degree by utilizing loans, grants, pre-paid sales tax, and planning measures described in the regional EIS part 1, chapters II, III and IV.

F. ALLOW DEVELOPMENT OF SELECTED AREAS NOW UNDER LEASE

This alternative would permit only selective exploration and development on existing leaseholds, based on anticipated adverse environmental consequences. The decisionmaker has the authority and responsibility to evaluate the coal resources and impacts of mining on this lease prior to acting on the proposals. Exploration and development could be allowed only on these leaseholds, or portions thereof, that would have the lowest anticipated adverse environmental consequences. Weighing the tradeoffs of mining or precluding mining on selected tracts is part of the evaluation and decision process. Adoption of this alternative would reduce adverse effects by reducing the area in which the impacting activities could take place.

The alternative of allowing the development of only selected areas already under lease constitutes a selective application of the above. Absent a showing lease-by-lease or plan-by-plan of the likelihood of totally unacceptable environmental impacts that could not be reduced to an acceptable level, the Secretary does not possess the authority to otherwise constrain development of the leasehold if all other requirements of the lease have been met. In addition, application of this alternative would not permit maximum recovery of the coal resources and would then 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.

CHAPTER IX: CONSULTATION AND COORDINATION WITH OTHERS

A. FEDERAL AGENCIES

Bureau of Land Management, Geological Survey, USDA Forest Service, Fish and Wildlife Service, Soil Conservation Service, and National Weather Service.

B. UTAH STATE AGENCIES

Geological and Mineralogical Survey, Division of Water Resources, Division of Water Rights, Division of Health, State Engineer, State Climatologist, Division of Wildlife Resources, Division of State Lands, Division of Parks and Recreation, Department of Transportation, Outdoor Recreation Agency, and Institute for the Study of Outdoor Recreation and Tourism, Utah State University, Logan, Utah.

C. COUNTY AND LOCAL GOVERNMENT

Southeastern Association of Governments

D. PRIVATE INDIVIDUALS AND ORGANIZATIONS, INDUSTRY AND NONINDUSTRY

Energy Reserves Group provided data and information on their proposed activities. Mr. Maurice Rasmussen, Salina City Councilman, provided data and assistance.

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 the region on the air quality: Pasadena, Calif., Final Report.

Boner, T. C., 1977, Final report - Endangered and unique terrestrial wildlife species within the coal study area: Report to BLM on contract no. YA-512-C26-257; Utah State Division of Wildlife Resources.

Bureau of Land Management, 1977, Final environmental statement, Emery powerplant: Salt Lake City, Utah State Office.

Doelling, H. H., 1972, Central Utah coal fields: Sevier-Sanpete, Wasatch Plateau, Book Cliffs, and Emery: Utah Geol. and Mineral. Survey Mon. no. 3, 571 p.

Ellis, D. H., Smith, D. G., and Murphy, J. R., 1969, Studies on raptor mortality in western Utah: The Great Basin Naturalist, v. 29, no. 3, p. 165-167.

Environmental Research and Technology (ERT), 1978, Regional statement component for the southwest Wyoming coal development; environmental statement - climate and air quality section: ERT document P-3661-B.

Gilbert, P. F., 1947, Bear studies: Denver, Colorado, Colo. Game and Fish Dept., Federal Aid Quart., Oct. 1947, p. 5-9.

Grinnell, J., Dixon, J. S., and Linsdale, J. M., 1937, Black bears, in Furbearing mammals of California, v. 1: Berkeley, Calif., Univ. of Calif. Press.

Hagihara, J. S., Rice, C. M., and Langen, L. N., 1972, Interim guide for rating soils according to their soil suitability for rangeland seeding - Nevada: Bureau of Land Management.

Hunt, J. F., Becker, W. H., Dalton, M. J., and McCool, S. F., 1976, Utah resident recreation manual, 1974-1976: Logan, Utah, Institute for the Study of Outdoor Recreation and Tourism, Utah State Univ.

Nish, D. H., 1977, Utah upland game annual report 1976: Salt Lake City, Utah, Utah Division of Wildlife Resources, pub. no. 77-6.

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

Seidensticker, J. C., Hornocker, M., Wiles, W., and Messick, J., 1973, Mountain lion social organization in the Idaho primitive area: Washington, D. C., Wildlife, Mono. no. 35, The Wildlife Society.

Tisch, E. L., 1961, Seasonal food habits of the black bear in the Whitefish Range of northwestern Montana: Missoula, Montana, unpublished M.S. Thesis, Montana State Univ.

U.S. Forest Service, 1975, Land systems inventory, Salina Planning Unit: Richfield, Utah, Fishlake National Forest.

_____1976a, Final environmental statement for land use plan, Salina Planning Unit, Fishlake National Forest: Ogden, Utah, USDA-FS-FES (ADM), R4-76-8, Intermountain Region.

_____1976b, Fishlake National Forest travel plan, Aug. 17, 1976.

U.S. Geological Survey, 1976, Water resource data for Utah - 1975: Salt Lake City, Utah, Water Data Report no. UT-75-1, 509 p.

Utah Industrial Promotion Division, 1976, County economic facts, 1975, Kane County: Salt Lake City, Utah, Bureau of Economic and Business Research, Univ. of Utah.

Utah State University and U.S. Department of Agriculture, Soil Conservation Service, 1975, Soils of Utah: Logan, Utah, Agricultural Experiment Station Bull. 492.

Utah Division of Wildlife Resources, 1977, Utah big game investigations and management recommendations 1977: Salt Lake City, Utah, pub. no. 77-5.

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

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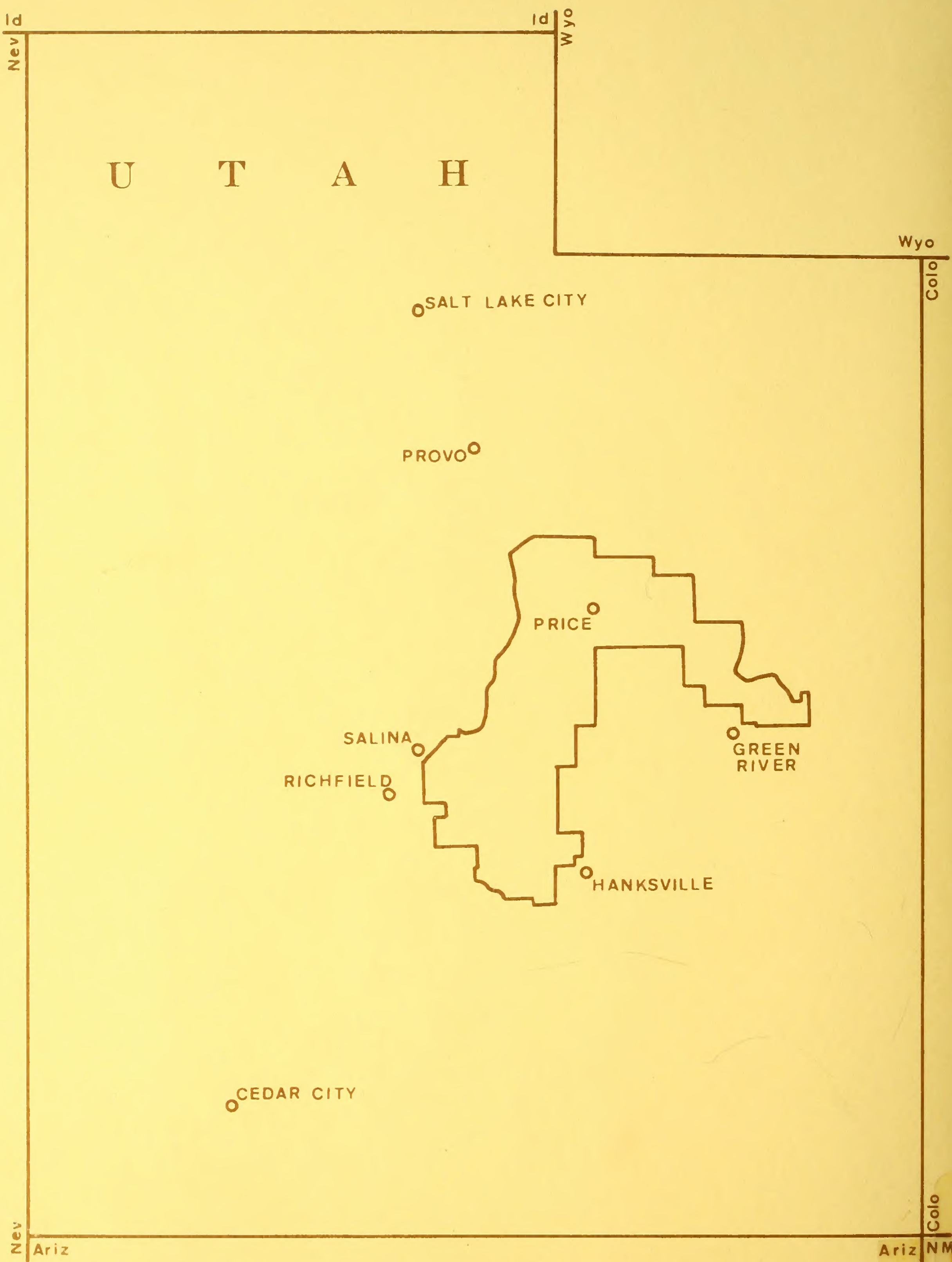

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