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State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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Salt Lake City, Utah 84180-1203
801-538-5340

August 9, 1989

Mr. Rick Olsen, President
Soldier Creek Coal Company
P. O. Box I
Price, Utah 84526

Dear Mr. Olsen:

Re: Revised State Permit and Decision Package, Soldier Creek Coal Company, Soldier Canyon Mine, ACT/007/018, Folder #3, Carbon County, Utah

Enclosed is a revised permanent program mining permit for the Soldier Canyon Mine, which includes new state lease ML-44365. Also included is a copy of the State's Decision Document and Technical Analysis for the lease addition.

The permit approval date is the date on the top of the first page of the revised permit, August 8, 1989. The permit will still expire on the original permit expiration date, February 3, 1992. Two copies of the permit are included. Please read the conditions, then sign both copies and return one to the Division.

Your cooperation during the permitting process is appreciated.

Best Regards,

Dianne

Dianne R. Nielson
Director

Enclosures
cc: P. Rutledge, OSM
R. Hagen, OSM
P. Spurgeon, State Lands
B Team
PFO
BT45/279

UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION DOCUMENT AND
TECHNICAL ANALYSIS

Soldier Creek Coal Company
Soldier Canyon Mine
Lease ML-44365 Addition
ACT/007/018
Carbon County, Utah

August 8, 1989

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ADMINISTRATIVE OVERVIEW

Soldier Creek Coal Company
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Carbon County, Utah

August 8, 1989

BACKGROUND

Soldier Creek Coal Company (SCCC) proposes to add State lease ML-44365 to the currently approved permit area for the Soldier Canyon Mine.

The Mining and Reclamation Plan (MRP) for the Soldier Canyon Mine was originally approved by the Division of Oil, Gas and Mining (DOGM) and the Office of Surface Mining Reclamation and Enforcement (OSMRE) on June 10, 1985. The approved permit area consisted of two federal coal leases, SL-051279-063188 and U-50722, encompassing 2,143.81 acres. The Bureau of Land Management (BLM) administers 590 of those acres and the remainder are privately owned.

In June of 1986 SCCC was sold to the Sun Company. A new MRP was submitted which incorporated two new state coal leases (ML-21994 and ML-22675) and portions of two other state leases (ML-42648 and ML-42649), held by affiliates of Sun Company, into the permit area. The new MRP was approved by DOGM on February 3, 1987, bringing the permitted area to a total of 4,347.99 acres. Due to the extensive additions to the permit area and submittal of a complete new MRP, a new five-year permanent program was issued with the approval.

SCCC acquired state lease ML-44365 on April 3, 1989 and requested that it be added to the permit area on April 17, 1989. The lease encompasses 557.20 acres. The new lease will be mined as an extension of existing mines in the Gilson, Rock Canyon and Sunnyside coal seams.

ANALYSIS

No new surface disturbance is proposed to facilitate the mining of the new lease at this time. No additional bond will be required. In addition, SCCC identified lease ML-44365 as an area of pending interest in the 1986 MRP and submitted baseline information on the area of the lease as part of the proposed life-of-mine permit

area. The Findings, Cumulative Hydrologic Impact Assessment (CHIA) and Technical Analysis (TA) of February 1987 all included an assessment of potential mining impacts to this area. Upon recipt of the lease, SCCC submitted more specific and detailed plans regarding the mining practices to be undertaken in lease ML-44365. Therefore this TA addresses only the effects which will be directly related to the underground mining of this lease. It is DOGM's opinion that the sections addressed in the following TA differ significantly from the mining and reclamation practices and procedures which were approved in the five-year permit renewal. Those sections not addressed here were determined to be in compliance with the approved MRP and have been addressed in the previous TA, Findings and CHIA.

RECOMMENDATION

SCCC has demonstrated that mining of lease ML-44365 can be done in conformance with the Surface Mining Control and Reclamation Act, and the corresponding Utah Act and performance standards. No issues were raised during the review process or public comment period. A 510(c) report was run on the Applicant Violator System and no problems were encountered (see attached Memos). It is therefore recommended that approval be given for the addition of this lease to the permit area.

LOCATION MAP

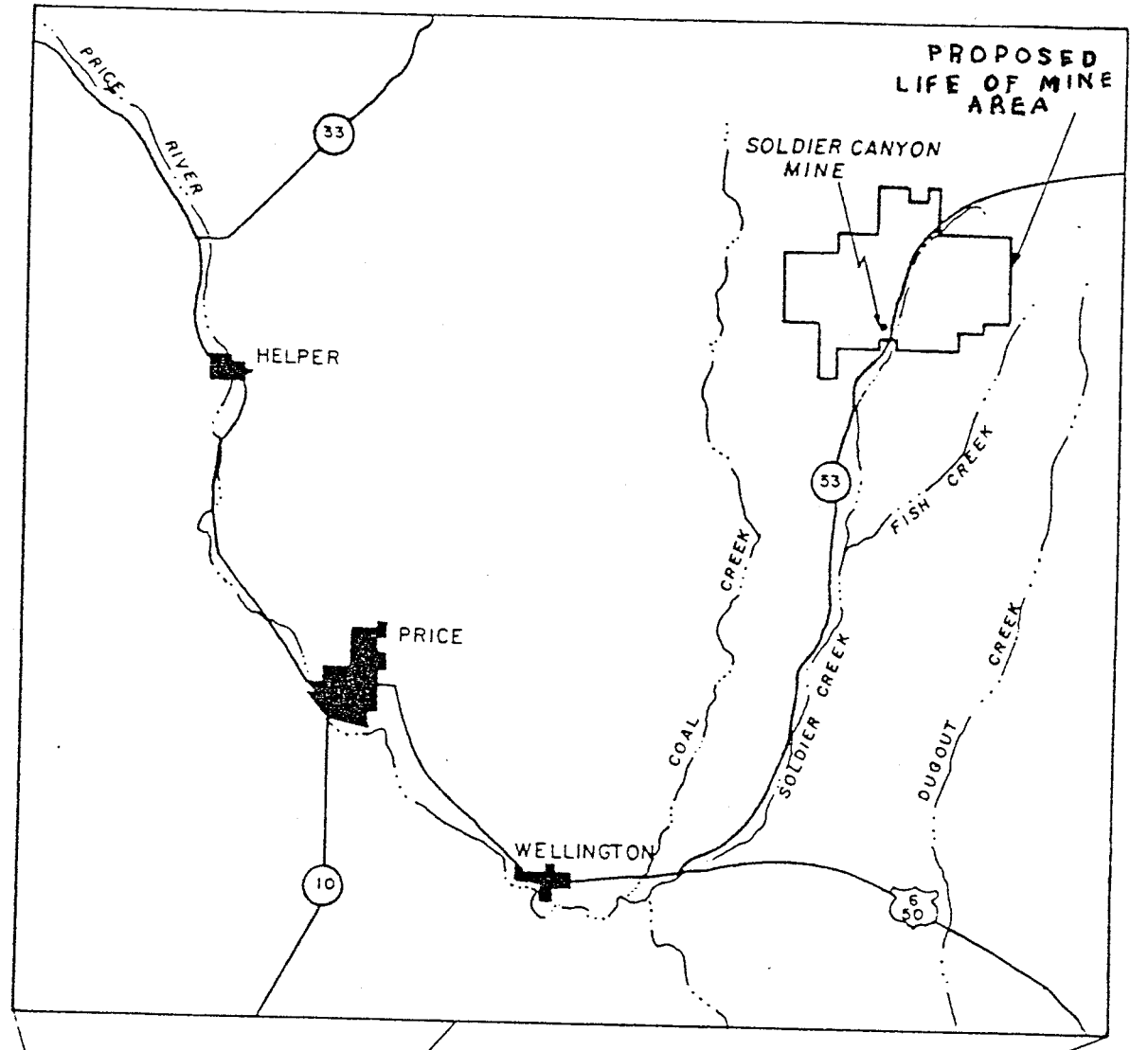


FIGURE 1

Soldier Creek Coal Company

SOLDIER CANYON MINE

TITLE

MINE LOCATION

CARBON COUNTY, UTAH

DRAWING NO

REVISIONS

NO	DATE	BY
1		
2		
3		

DRAWN BY DEV DE NEIR 11/26/85

CHECKED C.W.D 12/2/85

SCALE AS SHOWN

PERMITTING CHRONOLOGY

Soldier Creek Coal Company
Soldier Canyon Mine
Lease ML-44365 Addition
ACT/007/018
Carbon County, Utah

August 8, 1989

4/17/89	Soldier Creek Coal Company (SCCC) requests addition of Lease ML-44365 to the Soldier Canyon Mine permit area.
5/10/89	Division of Oil, Gas & Mining (DOGM) determines the application for the new lease to be complete and forwards notice of the complete application to other interested agencies.
5/16, 23, 30, 6/6/89	SCCC publishes notice of a complete application for the lease addition.
6/3/89	DOGM notifies SCCC of deficiencies in the plan which must be addressed prior to final permit approval.
6/22/89	SCCC responds to deficiencies.
7/6/89	Public comment period ends with no comments received.
7/31/89	SCCC transmits executed lease, information on corporate structure.
8/8/89	DOGM issues Decision Document and revised state permit.

MINE PLAN INFORMATION

Mine Name: Soldier Canyon Mine State ID: ACT/007/018

Operator: Soldier Creek Coal Company County: Carbon

Controlled By: The Sun Company
Contact Person(s): J. Thomas Paluso Position: Chief Engineer
Telephone: (801) 637-6360

New/Existing: Both Mining Method: Room and Pillar

Federal Lease No(s).: SL-051279-063188; U-50722
Legal Description(s): **SL-051279-063188:** T.13S.,R.11E.,Sec. 12: E1/2 E1/2, Sec. 13: NE1/4NE1/4, SE1/4NE1/4, NE1/4SE1/4, Sec. 18: Lot 2 (SW1/4NW1/4), SE1/4NW1/4 T.13S.,R.12E.,Sec. 7: All, Sec.8: W1/2, Sec.17:NW1/4, Sec. 18: N1/2NE1/4, SE1/4 NE1/4, NE1/4NW1/4, Lot 1 (NW1/4NW1/4); **U-50722:** T.13S.,R.11E.,Sec.12: E1/2W1/2, W1/2E1/2, Sec. 13: NW1/4NE1/4, NE1/4NW1/4

State Lease No(s).: ML-21994;ML-22675;ML-42648(part);ML-42649(part);ML-44365
Legal Description(s): **ML-21994:** T.12S.,R.12E.,Sec.32: S1/2; **ML-22675:** T.12S., R.12E.,Sec.32: NE1/4NE1/4, S1/2NE1/4, NW1/4; **ML-42648:** T.13S.,R12E.,Sec.8:E1/2, Sec.17: NE1/4; **ML-42649:** T.13S.,R.12E.,Sec.4: S1/2, Lots 1,2,3,4, Sec.5: SE1/4, Lots 1,2, Sec.9: W1/2, NE1/4, N1/2SE1/4; **ML-44635:** T.13S.R.12E.,Sec.5: SW1/4, Lots 3,4, Sec.6: All

Other Leases (identify): None

Legal Description(s):

Ownership Data:

Surface Resources (acres):	Existing Permit Area	Proposed Permit Area	Total Life Of Mine Area
Federal	590.19		590.19
State	2197.80	557.20	2755.00
Private	1560		1560
Other			
TOTAL	4347.99	557.20	4905.19

Coal Ownership (acres):

Federal	2111.63		2111.63
State	2197.80	557.20	2755.00
Private			
Other			
TOTAL	4309.43	557.20	4866.63

Coal Resource Data	Total Reserves (Tons)	Total Recoverable Reserves (Tons)
Federal	27,155.8	10,637.7
State	76,917.3	29,447.2
Private		
Other		
TOTAL (Life of Mine)	104,073.1	40,084.9
Total Percent Recoverable	38.5%	(See attached Table)

Recoverable Reserve Data	Name	Thickness	(Map)	Depth
Seam	Sunnyside	5' - 11'	(E031)	250' - 2700'
Seam	Gilson	1' - 18'	(E033)	250' - 2700'
Seam	Rock Canyon	6' - 12'	(E032)	250' - 2700'
Seam				
Seam				
Seam				

Mine Life: 1976-2016
Average Annual Production: 1,300,000 Tons Percent Recovery: 34 - 40%
Date Projected Annual Rate Reached: 1990-2005
Date Production Begins: 1976 Date Production Ends: 2016
Reserves Recoverable By: (1) Surface Mining: None
(2)Underground Mining: 40,089 Tons
Reserves Lost Through Management Decisions: Unknown
Coal Market: Unknown

Modifications that have been approved:	Date:
Addition of Leases ML-21994, ML-22675, ML-42648 (part) ML-42649 (part)	February 3, 1987

TABLE 4.3-1

RECOVERABLE STATE AND FEDERAL COAL BY LEASE
(000's tons)

	SUNNYSIDE SEAM			ROCK CANYON SEAM			GILSON SEAM			TOTAL ALL SEAMS		
	TONS IN PLACE	REC. TONS	PERCENT REC.	TONS IN PLACE	REC. TONS	PERCENT REC.	TONS IN PLACE	REC. TONS	PERCENT REC.	TONS IN PLACE	REC. TONS	PERCENT REC.
PERMIT AREA												
State Leases												
ML-21994	3753.6	2231.0	59.4	5192.9		0.0	6298.8	3464.7	55.0	15245.3	5695.7	37.4
ML-22675	1948.2	920.3	47.2	1803.7		0.0	7849.7	2261.5	28.8	11601.6	3181.8	27.4
ML-42648	1727.5	605.9	35.1	2770.7	907.5	32.8	255.6		0.0	4753.8	1513.4	31.8
ML-42649	9634.2	7307.3	75.8	5915.3	187.4	3.2	7274.2	3875.3	53.3	22823.7	11370	49.8
SUBTOTAL	17063.5	11064.5	64.8	15682.6	1094.9	7.0	21678.3	9601.5	44.3	54424.4	21760.9	40.0
Federal Leases												
SL-051279	2296.6	751.5	32.7	11216.2	6500.9	58.0	7397.3		0.0	20910.1	7252.4	34.7
U-50722				4744.8	3385.3	71.3	1500.9		0.0	6245.7	3385.3	54.2
SUBTOTAL	2296.6	751.5	32.7	15961.0	9886.2	61.9	8898.2	0.0	0.0	27155.8	10637.7	39.2
TOTAL	19360.1	11816.0	61.0	31643.6	10981.1	34.7	30576.5	9601.5	31.4	81580.2	32398.6	39.7
STATE UNLEASED												
Sec. 6 & 5	4446.7	2300.8	51.7	10249.3	5385.5	52.5	7796.9		0.0	22492.9	7686.3	34.2
TOTAL LIFE OF MINE	23806.8	14116.8	59.3	41892.9	16366.6	39.1	38373.4	9601.5	25.0	104073.1	40084.9	38.5
TOTAL STATE LEASES LIFE OF MINE	21510.2	13365.3	62.1	25931.9	6480.4	25.9	29475.2	9601.5	32.6	76917.3	29447.2	38.3

FINDINGS

Soldier Creek Coal Company
Soldier Canyon Mine
Lease ML-44365 Addition
ACT/007/018
Carbon County, Utah

August 8, 1989

1. The Division of Oil, Gas and Mining (DOGM) has determined that the approved permit application as amended and updated through July 31, 1989 is accurate and complete and complies with the requirements of the approved Utah State Program, the Surface Mining Control and Reclamation Act (SMCRA), and the Federal Lands Program, the Surface Mining Control and Reclamation Act (SMCRA), and the Federal Lands Program (UMC 786.19{a}).

2. The applicant proposes acceptable practices for the reclamation of disturbed lands (Mining and Reclamation Plan (MRP) Vol. 3, Part 5.0). These practices have been shown to be effective in the short-term; there are no long-term reclamation records utilizing native species in the western United States. Nevertheless, the regulatory authority has determined that reclamation, as required by the Act, can be feasibly accomplished under the MRP (see 1987 Technical Analysis {TA}, Section UMC 817.111-.117) (UMC 786.19{b}).

3. The assessment of the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance has been made by the regulatory authority. The mining operation proposed under the application has been designed to prevent damage to the hydrologic balance in the permit area and in the associated off-site areas (UMC 786.19{c}). (See Cumulative Hydrologic Impact Analysis (CHIA) Section, attached to this Findings Document.)

4. The proposed permit area is (UMC 786.19{d}):

   A. Not included within an area designated unsuitable for underground coal mining operations:

   B. Not within an area under study for designated lands unsuitable for underground coal mining operations;

   C. Not on any lands subject to the prohibitions or limitations of 30 CFR 761.11(a) (national parks, etc.), 761.11(f) (public buildings, etc.) and 761.11(g) (cemeteries);

D. Within 100 feet of the outside right-of-way of Utah Highway 53, a public road. The applicant has received formal permission from the Carbon County Commissioners to mine within 100 feet of the right-of-way of a public road;

E Not within 300 feet of any occupied dwelling (MRP, Volume 1, p. 2-28).

5. The issuance of a revised permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800) (UMC 786.19{e}). See letter from SHPO dated May 26, 1989 attached to TA.

6. The applicant has the legal right to enter and begin underground activities in the permit area through two Federal leases and five state leases (see MRP, Volume 1, pp. 2-17 to 2-23) (UMC 786.19{f}).

7. The applicant has shown that prior violations of applicable law and regulations have been corrected (MRP, Volume 1, pp. 2-15 to 2-16a) (UMC 786.19{g}).

   Soldier Creek Coal Company (SCCC) is not delinquent in payment of fees for the Abandoned Mine Reclamation Fund for its active mining operation (UMC 786.19{h}).

   The applicant does not control and has not controlled mining operations with a demonstrated pattern of willful violations of the Act of such nature, duration and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (UMC 786.19{i}).

8. Underground coal mining and reclamation operations to be performed under the permit will not be inconsistent with other such operations anticipated to be performed in areas adjacent to the proposed permit area (UMC 786.19{j}). No other mines are operational in the immediate vicinity.

9. A bond in the amount of $577.000.00, payable to DOGM and OSMRE, has been posted. This bond is adequate to reflect costs which would be incurred by the state to reclaim areas currently disturbed.

10. No lands designated as prime farmlands or alluvial valley floors occur on the permit area (MRP, Volume 2, Sections 3.8, 3.9) (UMC 786.19{l}). See 1987 TA, Section 822 for a discussion of alluvial valley floors pertinent to the permit area.

11. The proposed postmining land-use of the permit area has been approved by the U.S. Bureau of Land Management, the controller of some of the land surface in the permit area, OSMRE, and DOGM (See December 1984 Mining Plan Decision Document for the Soldier Canyon Mine).

12. The regulatory authority has made all specific approvals required by the Act, and the approved State Program (UMC 786.19{n}).

13. The proposed operation will not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats (MRP, Volume 2, pp. 3-245 to 3-250, 3-192) (UMC 786.19{o}). The U.S. Fish & Wildlife Service has determined that the mine will have no effect on any listed Threatened or Endangered Species (see December 1984 Mining Plan Decision Document).

14. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with (UMC 786.23(a){2}).

15. No existing structures will be used in conjunction with mining of the new lease addition, other than those constructed in compliance with the performance standards and subchapter K under the existing permit (UMC 786.21).

Susan C. Linner
Permit Supervisor

Lowell P Braxton
Associate Director, Mining
Division of Oil, Gas and Mining

Dianne R. Nielson
Director
Division of Oil, Gas and Mining

Cumulative Hydrologic Impact Assessment

Soldier Creek Coal Company
Soldier Canyon Mine
ACT/007/018
Carbon County, Utah

February 4, 1987

I. Introduction

This report is a Cumulative Hydrologic Impact Assessment (CHIA) of Soldier Creek Coal Company's Soldier Canyon Mine operating in Carbon County, Utah. This assessment encompasses the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance and whether the operations proposed under the application have been designed to prevent damage to the hydrologic balance outside the proposed mine plan area. This report complies with federal legislation passed under the Surface Mining Control and Reclamation Act (SMCRA) and subsequent Utah and federal regulatory programs under UMC 786.19(c) and 30 CFR 784.14(f), respectively.

The Soldier Canyon Mine is located in the Book Cliffs Coal Field approximately 12 miles northeast of Price, Utah (Figure 1). The Book Cliffs form a rugged, southerly facing escarpment that delineates the Uintah Basin to the north from the San Rafael Swell to the south. Elevations along the Book Cliffs range from approximately 5,000 to 9,000 feet.

Outcropping rocks of the Book Cliffs range from Upper Cretaceous to Quaternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) through littoral and lagoonal (Blackhawk Formation) to fluvial (Castlegate Sandstone, Price River Formation and North Horn Formation) and lacustrine (Flagstaff Formation and Green River Formation) depositional environments. Oscillating depositional environments within the overall regressive trend are represented by members of the Blackhawk Formation and the Colton Formation. The major coal-bearing unit within the Book Cliffs Coal Field is the Blackhawk Formation.

Precipitation varies from 20 inches at higher elevations to 5 inches at lower elevations. The Book Cliffs area may be classified as mid-latitude steppe to semi arid desert.

Vegetation varies from the sagebrush/grass community type at lower elevations to the Douglas fir/aspen community at higher elevations. Other vegetative communities include mountain brush, pinyon-juniper, pinyon-juniper/sagebrush and riparian. These communities are primarily used for wildlife habitat and livestock grazing.

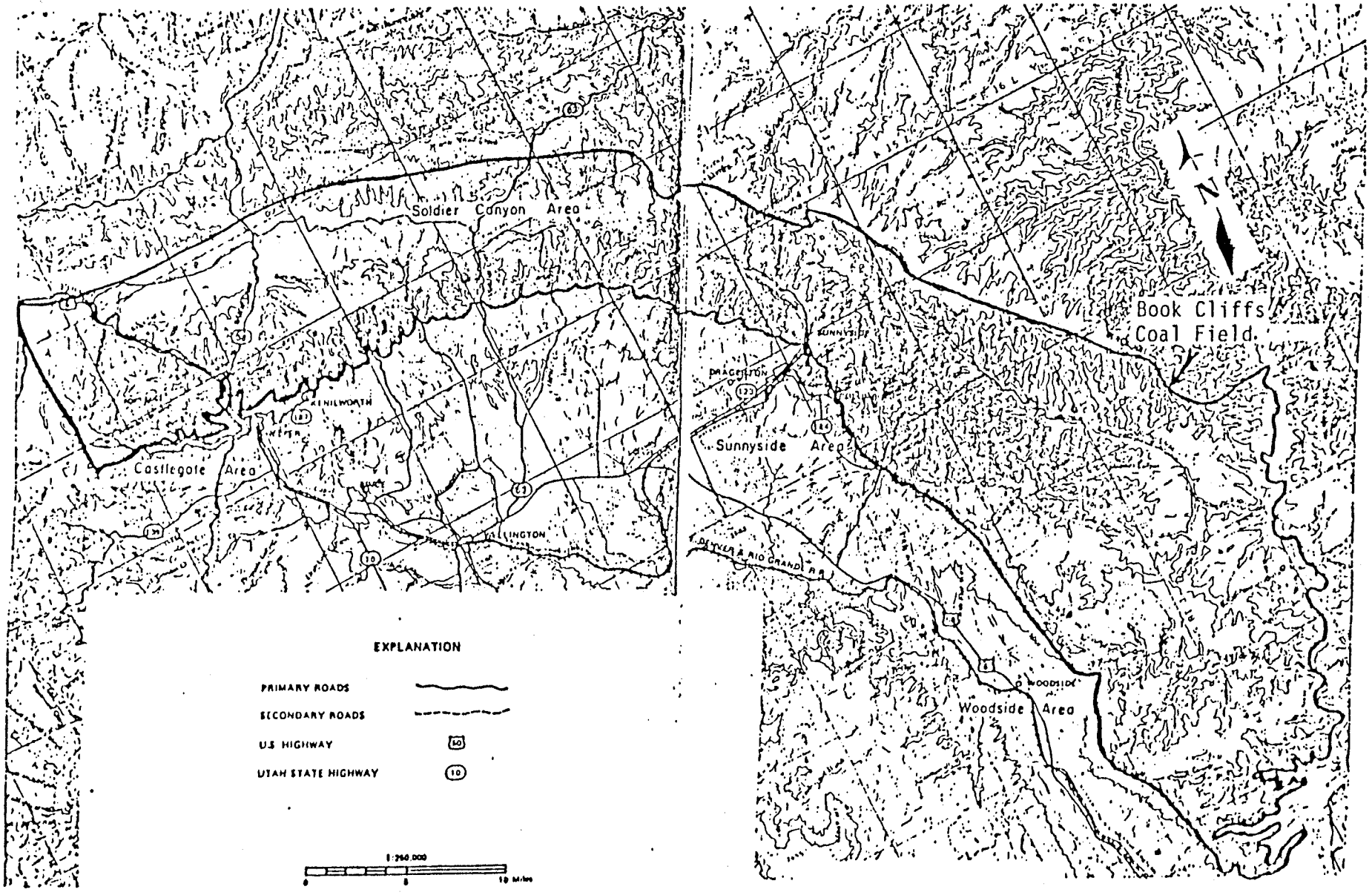


Figure 1. Book Cliffs Coal Field.

From:. Doelling 1972.

Surface runoff from the Book Cliffs area flows into the Price River drainage basin of east-central Utah. The Price River originates near Scofield Reservoir and flows southeasterly into the Green River, north of the town of Green River, Utah. Water quality is good in the mountainous headwater tributaries, but deteriorates rapidly as flow traverses the Mancos Shale. The shale lithology typically has low permeability, is easily eroded and contains large quantities of soluble salts that are a major contributor to poor water quality. Depending upon the duration of contact, water quality degrades downstream to where total dissolved solids (TDS) levels of 3,000 milligrams per liter (mg/l) are not uncommon. The predominant ion leached from the Mancos Shale is sulfate (SO_4) with values over 1,000 mg/l common in the lower reaches of the Price River.

II. Cumulative Impact Area (CIA)

The Cumulative Impact Area is shown in Plate 1, Figure 2. It encompasses approximately 21,700 acres and surrounds the Soldier Creek Mine complex. The permit area consists of 4,348 acres and includes the mine, a waste rock disposal area and a sewage lagoon site. Soldier Creek, Pine Creek and Fish Creek represent the drainages of the CIA.

The closest minesite to the CIA is Andalex's Centennial Project, Figure 2, approximately 2 miles west of the Soldier Creek Mine Plan Area. Presently the mining effects from these two mines do not overlap and are therefore considered seperate hydrologic impact areas. Future mining may occur in the area between these mine permit areas depending on the results of an environmental assessment presently being conducted by the Bureau of Land Management (BLM).

On the southeast corner of the Soldier Creek mine plan area (Plate 1, Figure 2) is Sunedco's approved mine permit area. Mining plans for this area have been terminated by the company, and all federal leases within the approved permit area will be relinquished to the BLM.

III. Scope of Mining

Soldier Canyon Mine is owned and operated by Soldier Creek Coal Company, a third tier subsidiary of Sun Company, Inc. The mine was first opened in 1906, but little coal was produced until 1935 when Premium Coal operated the mine continuously until 1972. During those years approximately 1.2 million tons of coal were produced.

In September of 1974 California Portland Cement Company purchased the property and after making certain improvements resumed production on June 15, 1976.

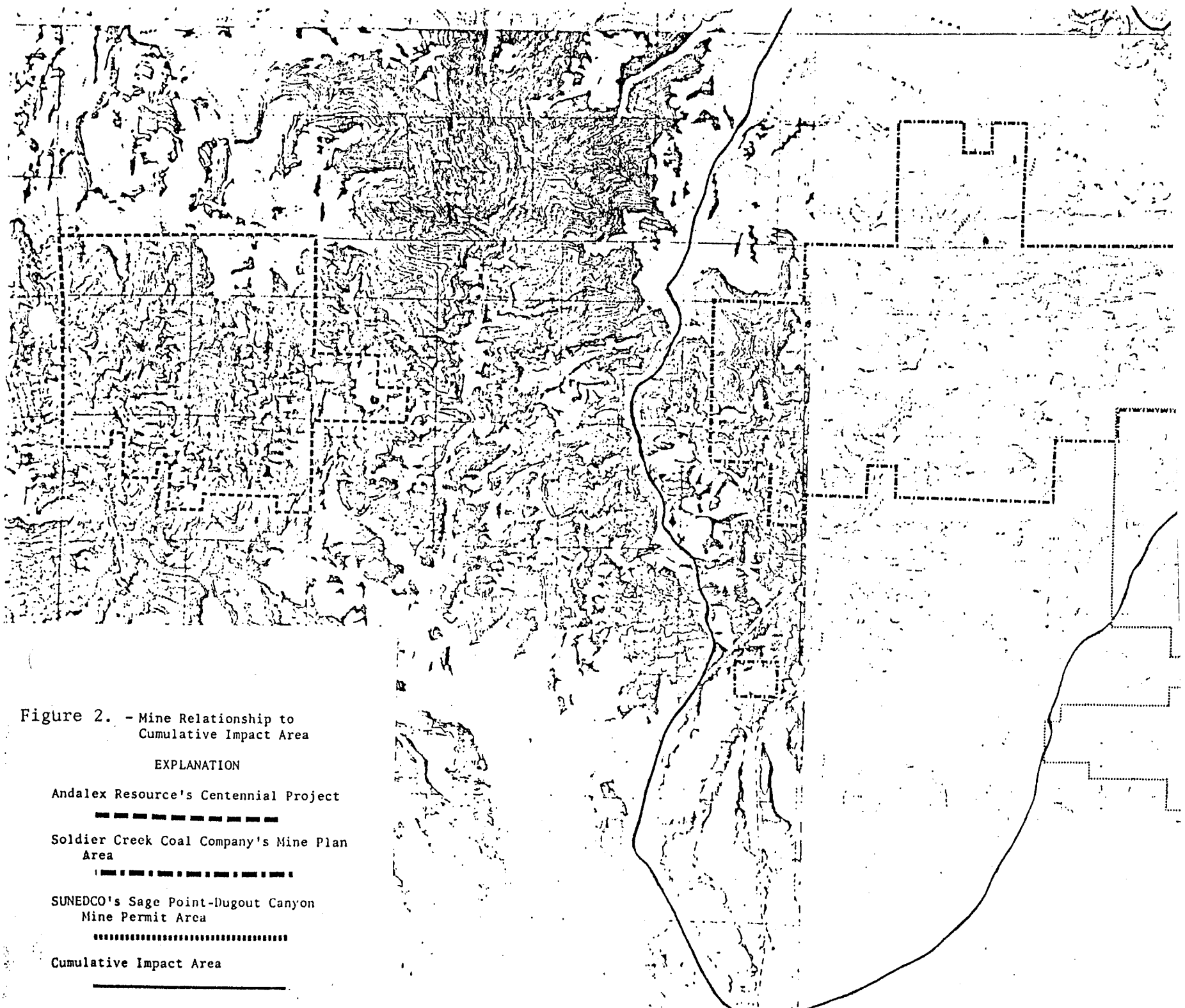


Figure 2. - Mine Relationship to Cumulative Impact Area

EXPLANATION

Andalex Resource's Centennial Project

Soldier Creek Coal Company's Mine Plan Area

SUNEDCO's Sage Point-Dugout Canyon Mine Permit Area

Cumulative Impact Area

On September 5, 1985 assets were transferred to Sunedco Coal Co., a subsidiary of Sun Company, Inc. Ownership of the federal and state coal leases are held by two affiliate companies, Sunedco Coal Company and Sunoco Energy Development Co. With the acquisition of the Soldier Canyon property, Sunedco Coal Company, chose to combine that acreage with certain adjacent acreage which had previously been included in a proposed project: Sage Point-Dugout Canyon.

Current mine production is estimated to be 800,000 tons for 1986. Future maximum annual production is expected to be approximately 1.75 million tons per year. Coal is being mined from the Rock Canyon seam by the room and pillar method. Future mining will include longwall mining methods and coal will be extracted from the Rock Canyon, Gilson and Sunnyside seams.

Mine workings are approximately 2 miles in width and extend 1.5 miles down dip. Mining, during the first five year permit term, will occur in the Rock Canyon and amd Sunnyside coal seams. Coal will be produced by longwall and room and pillar mining methods.

Overburden thickness ranges from approximately 100 feet under Soldier Creek Canyon to over 2,000 feet above the panels to be mined.

IV. Study Area

A. GEOLOGY

The geology of the CIA consists of stratigraphic units of consolidated rock ranging in age from Late Cretaceous to Tertiary (Eocene) as seen in Figure 3. The oldest rocks include members of the Mancos Shale. The Mesaverde Group overlies the Mancos Shale and consists of the Starpoint Sandstone, Blackhawk Formation, Castlegate Sandstone and Price River Formation. Overlying the Mesaverde Group are the North Horn Formation, Flagstaff Limestone and Colton Formation which form the Wasatch Group of Paleocene to Eocene age. The Green River Formation is Eocene in age and forms the uppermost consolidated formation in the CIA. Unconsolidated deposits formed from weathering and erosion exist as soils in Whitmore Park, terrace deposits and gravels along canyon streams and pediments at the base of escarpments.

There are no major disconformities in the area. The formations were tilted north-eastward in responce to the rise of the San Rafael Swell, and Socally, Farnam Anticlines. The strike of the area changes from N 84°W on the west to N 65°W on the east. The dip ranges from 6° to 12° and averages 8° northeast.

Faulting within the CIA is minor. Only one fault with a two foot displacement was found between the right and left forks of Fish Creek. Fracturing appears to parallel the strike of the Book Cliffs

System	Series	Stratigraphic unit		Thickness (feet)	Description
TERTIARY	Eocene	Green River Formation		–	Greenish gray and white claystone and shale, also contains fine-grained and thin-bedded sandstone. Shales often dark brown containing carbonaceous matter. Full thickness not exposed.
		Colton Formation	Wasatch Formation	300-2,000 3,000	Colton consists of brown to dark red lenticular sandstone, shale and siltstone, thins westwardly and considered a tongue of the Wasatch. Wasatch predominantly sandstone with interbedded red and green shales with basal conglomerate. Found in east part of field and equivalent to Colton and Flagstaff in west.
	Paleocene	Flagstaff Limestone		0- 500	Flagstaff mainly light gray and cream colored limestones, variegated shale, and fine-grained, reddish brown, calcareous sandstone.
		North Horn Formation *MINOR COAL*	Tuscher Formation	350-2,500 0- 200	Gray to gray green calcareous and silty shale, tan to yellow-gray fine-grained sandstone and minor conglomerate. Unit thickens to west. Light gray to cream-white friable massive sandstone and subordinate buff to gray shale that exhibits light greenish cast. Contains minor conglomerate and probably represents lower part of North Horn, only present in east part of field.
CRETACEOUS	Danian Maestrichthian	Mesaverde Group	Price River Formation *MINOR COAL*	500-1,500	Yellow-gray to white, medium-grained sandstone and shaley sandstone with gray to olive green shale. Contains carbonaceous shale with minor coal and thickens along east edge of field.
	Campanian		Castlegate Sandstone *MINOR COAL*	100- 500	White to gray, fine- to medium-grained, argillaceous massive resistant sandstone thinning eastwardly with subordinate shale. Carbonaceous east of Horse Canyon but coal is thin and lignitic.
			Blackhawk Formation *MAJOR COAL SEAMS*	600-1,100	Cyclical littoral and lagoonal deposits with six major cycles. Littoral deposits mainly thick-bedded to massive cliff-forming yellow-gray fine- to medium-grained sandstone, individual beds separated by gray shale. Lagoonal facies consist of thin- to thick-bedded yellow-gray sandstones, shaley sandstones, shale and coal. Coal beds form basis of Book Cliffs coal field. Unit thins eastward grading into the Mancos Shale.
			Star Point Sandstone	0- 580	Yellow-gray massive medium- to fine-grained littoral sandstone tongues projecting easterly separated by gray marine shale tongues projecting westerly.
	Santonian Coniacian	Masuk Tongue Emery Sandstone Garley Canyon Sandstone Blue Gate Shale	Mancos Shale	4,300-5,050	Gray marine shale, locally heavily charged with carbonaceous material, slightly calcareous and gypsiferous, nonresistant forming flat desert surfaces and rounded hills and badlands. Separated mainly to the west into tongues by westward projecting littoral sandstone which eventually grade into shale. Sandstones are fine- to medium-grained, yellow-gray to tan and medium-bedded to massive and cliff forming.
	Turonian	Ferron Sandstone *MINOR COAL*			
	Cenomanian	Tununk Shale			
		Dakota Sandstone		2- 126	Heterogeneous sandstone, conglomerate and shale, thin resistant cuesta former.

Figure 3. Generalized Stratigraphy of the Soldier Canyon Mine Area (After Doelling, 1972).

escarpment, and hence the strike of the strata itself. It appears to be the result of isostatic adjustment and general upwarping associated with the San Rafael Swell and subsequent erosional, tectonic and orogenic events. Clear measurements taken in the currently operating mine show face cleat direction is within a few degrees of the strike of the coal bed.

Mining operations are restricted to the Blackhawk Formation. Data indicates five coal zones that show lateral consistancy: from top to bottom they are the Sunnyside, Rock Canyon, Fish Creek, Gilson, and Kenilworth. The Sunnyside, Rock Canyon and Gilson Seams contain minable reserves and will be mined by Soldier Creek Coal Company.

B. TOPOGRAPHY AND PRECIPITATION

Topography ranges from less than 6,000 feet to approximately 8,500 feet in the CIA. Predominant features that exist in the CIA are cliffs, narrow canyons, valleys and pediments. Drainage in the CIA is characterized by a southerly draining system of perennial and ephemeral streams. Both Pine Creek and Soldier Creek are perennial streams and have headwaters that originate between 7500 and 8000 feet. Fish Creek, located near the eastern boundary of the CIA is ephemeral and flows only in response to rainfall and snowmelt. Additionally, a small unnamed ephemeral drainage exists near the western boundary of the CIA, south of the proposed waste rock disposal area.

Average annual precipitation ranges from approximately 10 inches in the vicinity of the waste rock disposal area to 16 inches in the headwater regions of Soldier Creek.

V. Hydrologic Resources

A. Groundwater

Groundwater in the CIA like groundwater in other parts of the Price River basin, occurs under both confined and unconfined conditions.

Snowmelt at higher elevations provides most of the groundwater recharge, particularly where permeable lithologies such as fractured or solution limestone are exposed at the surface. Vertical migration of groundwater occurs through permeable rock units and/or along zones of faulting and fracturing. Lateral migration initiates when groundwater encounters impermeable rock and flows laterally until either the land surface is intersected creating a perched spring or until vertical movement can continue.

Recharge has been estimated to be 3 to 8 percent (Danielson and Sylla 1983), 9 percent (Waddell et al 1983) and 12 percent (Simons, Li & Associates 1984) of the average annual precipitation for areas in the Wasatch Plateau and Book Cliffs coal fields.

The Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Limestone and Quaternary deposits all contain potential reservoirs or conduits for groundwater in the CIA. Reservoir lithologies are predominately sandstone and limestone. Sandstone reservcoirs occur as channel and overbank, lenticular and tabular deposits. whereas limestone reservoirs have developed through dissolution and fracturing. Shale, siltstone and cemented ssandstone beds act as aquatards or aquacludes to impede groundwater movement. The Mancos Shale is a regional aquaclude that limits downward flow within the CIA. Localized aquatards include the North Horn Formation and thin lithologies occuring within overlying units of the Price River, Castlegate and Blackhawk Formations.

Twenty-two springs (Table 1) or areas of multiple springs occur within the CIA (Plate 1). Twelve springs are located within the five-year permit area. The majority of springs flow from the contact zone between the Flagstaff Limestone and the North Horn Formation. No springs flow from the Blackhawk Formation within the CIA. All the springs on the escarpment are perched whereas those on the dip slope come from a ground water that has reached the surface through solution fractures or gradient levels.

Five wells are shown on Plate 1. Two wells were drilled within the mine to rock units above and below the Rock Canyon coal seam to help in defining the regional water table. Two wells were drilled by Eureka Energy in the early stages of exploration. The other well, as marked, is the shaft for the exaust fan along Soldier Creek drilled to a depth of 80 feet. Other exploration wells drilled by Eureka Energy lie outside the CIA. A comprehensive study has been made of the water depths, quality, transmisivities of strata and flow directions adjacent to the Soldier Mine properties (Sage Point-Dugout Canyon Mine Permit).

Total mine discharge is approximately 130 gpm. The majority of inflow occurs from a fire area that has been sealed for over a year. SCCC is currently dewatering that area to continue mining operations. Mine discharge should be reduced when pumping is complete.

Groundwater quality varies greatly, depending on geology, physiography, and elevation. The best quality occurs in or near mountain recharge areas and the poorest quality in lowland areas. Waddell et al (1983) indicate that the concentrations of dissolved solids range from 250 to 2,000 mg/l in the Book Cliffs area. The

HYDROLOGIC DATA COLLECTION SITES
SPRINGS

MAP NUMBER	LOCATION	GEOLOGIC UNIT	LAND SURFACE ELEVATION	SPRING NAME	OTHER DESIGNATIONS*
1	(D-12-11) 36aad	Flagstaff	7890		52[1]
2	(D-12-12) 30dcc	Flagstaff	7560		53[1]
3	" 33bcc	Flagstaff	7400		54[1]
4	" 34ccd	Flagstaff	7605		3[1]
5	(D-13-11) 1dab	Flagstaff	7930		55[1], S31-12
6	" 13acc	Aberdeen Tongue	6720	Drink	56[1]
7	(D-13-12) 4acd	Flagstaff	7480		57[1], G-87[2]
8	" 4bdc	North Horn	7410		2[1], G-88[2]
9	" 4cdd	Flagstaff	7910		33[1]
10	" 5cbc	North Horn	6980	Sulfur	8[1], G-89[2]
11	" 5cbc	North Horn	6980		24[1]
12	" 5ccb	North Horn	6970		9[1]
13	" 7aad	Price River	6880		10[1]
14	" 7cbb	North Horn	7600		S7-1[2]
15	" 8daa	Flagstaff	7900	Lower Little Pine	39[1]
16	" 8dad	North Horn	7840	Timber Road	38[1]
17	" 9cbb	Flagstaff	7940	Upper Little Pine	40[1], G-90/S8-1[2]
18	" 9dcc	Flagstaff	8120		31[1], G-91[2]
19	" 9dcc	North Horn	8090		32[1]
20	" 9ddc	Flagstaff	8090		30[1], G-92[2]
21	" 10abb	Flagstaff	7740	Water Hole	4[1]
22	" 10adb	Flagstaff	7870	Pine Canyon	42[1]

*1. Sage Point/Dugout Canyon Permit Application; 2. Soldier Canyon Permit Application; 3. U.S. Geological Survey.

Table 1.

chemical characteristics of the groundwater vary with the formation and areally within formations. The concentration of dissolved solids in water from the Flagstaff Limestone ranges from 250 to 500 mg/l, wheras the concentrations of dissolved solids in the Blackhawk and North Horn Formations range from 500 to 2,000 mg/l. The principal chemical constituents in Flagstaff water are calcium and bicarbonate. Water from the Blackhawk is of variable chemical composition with no single dominant cation or anion. Where dissolved solids concentrations from water in the Blackhawk are affected by the Mancos Shale, sulfates of sodium and magnesium increase significantly. Waters from springs which issue near the Blackhawk/Mancos Shale contact have dissolved solids concentrations of 1,600 and 2,000 mg/l, respectively (Mundorff, 1972; Waddell et al, 1981).

B. Surface Water

The CIA is situated in the Book Cliffs near the headwaters of the Price River Basin. The entire lease area drains toward Soldier Creek, a perennial tributary of the Price River. The Price River meets the Green River about 40 miles east of the mine. The Green River flows southward from its confluence with the Price River approximately 75 miles until it discharges into the Colorado River.

The Price River drainage area contains 1,540 mile^2 above a USGS streamflow gauging station at Woodside, Utah, which is about 24 miles below the inflow from Soldier Creek. The period of record for this station is 1909-1911 and 1945 to present. The extreme flows recorded include a maximum of 9,720 cfs on September 11, 1980 and a minimum of zero which has occurred at various times. The average annual flow volume is given as 83,320 ac-ft, or 155 cfs.

The flow of the Green River has been measured at Green River, Utah, about 12 miles below the confluence of the Price and Green Rivers. Between October, 1894 to October, 1899 and October, 1904 to the present, the flow ranged from a minimum of 255 cfs on November 26, 1931 to a maximum of 68,100 cfs on June 27, 1917. The average discharge over the 83 years is 6,305 cfs.

Snowmelt is the major source of water for the perennial streams of the Price River Basin. Ephemeral streams are abundant in the basins, existing primarily at lower elevations where potential evapotranspiration exceeds precipitation. Summer precipitation in the form of intense thunderstorms may cause short-term flooding but not large volumes of runoff.

Water use in the higher elevations of the Price River Basin is primarily for wildlife and stockwatering purposes . Within the lower valley area, agricultural activities utilize some of the water (Mundorff, 1972). Minimum flows in the gauged streams and rivers in the basin occasionally reach zero. Storage reservoirs are common at higher elevations.

In general, the quality of water in the headwaters of the Price River Basin is excellent, with the upper watershed providing most of the domestic water needs of the people in the lower valley. However, the quality rapidly deteriorates down gradient as the streams cross the Mancos Shale Formation and receive irrigation return flows from lands situated on Mancos-derived soils (Price and Waddell, 1973). Waddell et al (1981) report that Price River and its tributaries generally have a dissolved solids concentration of between 250 to 500 mg/l upstream from Helper. The water in this area is of calcium bicarbonate type. Between Helper and the confluence with Soldier Creek, most of the flows originate on Mancos Shale or are irrigation return flows which pass through Mancos Shale derived soils. The Price River near the confluence with Soldier Creek has an average dissolved solids content of about 1,700 mg/l, including sulfates of calcium, magnesium and sodium. At Woodside, the weighted average dissolved solids content is between 2,000 and 4,000 mg/l, with the water type being strongly sodium sulfate (Mundroff, 1972).

Sediment yields from the upper portion of the Price River Basin are small, with erosion rates varying from 0.1 to 0.5 ac-ft/miles^2/yr. The bulk of the sediment yield at the mouth of the Price River comes from limited areas covered by highly erodible shales. Annual sediment yields of 0.5 to 3.0 ac-ft/miles^2 are reported by Waddell et al (1981).

Surface Water Hydrology of the CIA

The CIA shown in Plate 1 is 21,700 ac of the Soldier Creek watershed. Topography in the area is rugged, with elevations varying from 6,600 ft to approximately 8,300 feet above sea level. Slopes vary from vertical cliffs to less than 2% along the ridges.

Water resources within or adjacent to the CIA include a few low yielding springs and streams. There are no major water bodies located within or adjacent to the CIA.

Soil cover varies with slope, with bare sandstone cliffs along the upper portions of the canyons, shallow silty soils on the milder slopes, and shallow sand-gravel alluvium in the channel bottoms. The soils classify as hydrologic soils group C and D. The infiltration rates of the soil results in moderately low infiltration capacity. Similar sub-basins within the Price River system indicate that runoff is approximately 16% of precipitation (UDWR, 1975).

The average annual sediment yield is approximately 0.2 to 1.0 ac-ft/miles^2 at the site (Waddell et al, 1981). Thus, the average annual sediment yield of the CIA is estimated to be 6.7 to 33.9 ac-ft for undisturbed conditions.

Soldier Creek

The headwaters of Soldier Creek are located in the Roan Cliffs and Whitmore Park as shown on Plate 1. The creek flows for 13.5 miles generally southward to the Anderson Reservoir diversion. The Anderson Reservoir stores water for irrigated fields. Soldier Creek discharges into the Price River about 10 miles south of the reservoir diversion. The lower 19 miles of Soldier Creek flows over Mancos Shale.

A USGS stream gauging station is located on Soldier Creek just downstream from the mine. The station is identified as "Soldier Creek Below Mine, Near Wellington, Utah, No 09313975," and is identified on Figure 4 as Surface Water Sampling Location G-5. The altitude of the gauge is 6,650 ft. The drainage area above the gauge includes sub-basins I through V and is 17.5 miles^2 (Plate 1 and Table 2). The period of record is from September of 1978 to September, 1984, and measurements are seasonal with no records kept during the winter months from December to February.

The maximum and minimum discharges are 472 and 0.08 cfs, respectively. The average elevation of the basin is 7,599 ft. The stream channel is 5.9 miles long and 10 to 20 ft wide near the gauge station. The creek bottom is on rocky alluvium and occasional outcrops of bedrock. The average stream channel gradient is 6%, and the average gradient of the land surface is 30%. For the entire basin, the average stream and land gradients are 4 and 23%, respectively.

Soldier Creek is a perennial stream between Sampling Location G-1, and the Anderson Reservoir diversion. The reach above G-1 is intermittent, with springs contributing small quantities of water that maintain portions of the stream before the water is consumed by evaporation and infiltration. The reach between the diversion and confluence with Price River would be perennial if the water were not diverted for irrigation during the low-flow period.

Pine Creek

The headwaters of Pine Creek are located in the area between the Book Cliffs and the Roan Cliffs near the northeastern part of the CIA. The creek flows in a generally westward direction for 4.1 miles until it discharges into Soldier Creek, 120 ft below Surface Water Sampling Location G-3 (Plate 1). The combined streams continue to Price River in the same manner as described for Soldier Creek.

The drainage area above contains 3.5 miles^2, with an average altitude of 7,943 ft. The stream channel is narrow, 2 to 6 ft, for most of its length, and is on alluvium, except for occasional outcrops of bedrock. The average gradient of the stream channel is 9%, and the average gradient of the land surface is 21%.

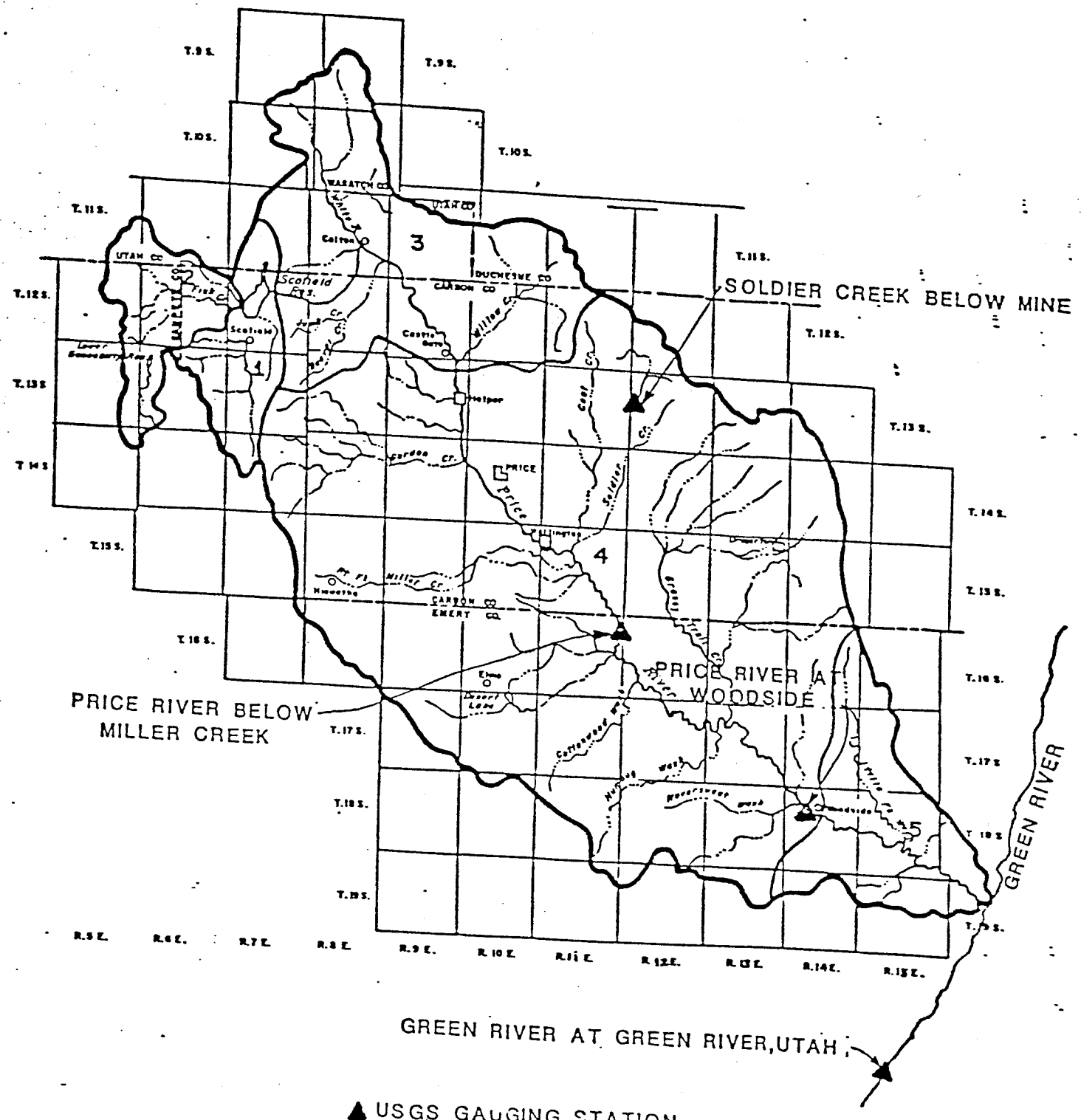
DRAINAGE SUB-BASINS WITHIN LIFE OF MINE AREA
AND ADJACENT AREAS

SUB-BASIN	AREA (mi^2)	AREA (ac)	MEAN ANNUAL PRECIP. (in.)	(ft)	ACRE/ ft
I	6.0	3,867	15	1.25	4,834
II	5.4	3,422	15	1.25	4,278
III	1.6	1,044	16	1.33	1,389
IV	1.9	1,235	16	1.33	1,643
V	2.6	1,689	14	1.17	1,976
VI	5.5	3,540	14	1.17	4,142
VII	1.3	821	16	1.33	1,092
					19,354

Total Precipitation on sub-basins within proposed LOM area and adjacent areas = 19,354 ac/ft.

19,354 ac/ft x 5% (estimated recharge) = 967.7 ac/ft.

TABLE 2 .



Source: Utah Division of Water Resources, 1975

Figure 4

Pine Creek contains water throughout its length most of the time. However, during periods of unusually low precipitation, there are dry reaches between the springs that feed the stream. Such a dry period occurred in the summer of 1977 when there was no flow at G-3 observed during three visits.

Water quality in Pine Creek, is good to excellent at G-3, with specific conductance varying from 420 to 720 mmhos/cm at 25°C. Values for most samples are on the over of 530 mmhos/cm. The water is predominantly a calcium bicarbonate type but a couple of samples showed high levels of sodium sulfate. The pH varied from 7.9 to 8.5. Suspended solid levels were generally low, except during spring snowmelt when concentrations were greater than 450 mg/l.

Water quality in Soldier Creek just below its confluence with Pine Creek (Surface Water Sampling Location G-4) is similar to that in Pine Creek. The watershed upstream of G-4 includes sub-basins I-IV, which contain an area of about 14.9 miles^2. TDS concentrations vary from 338 mg/l to 860 mg/l with most being between 500 and 600 mg/l. The dominant constituents are calcium and bicarbonates. The pH varied from 7.7 to 8.7 with most measurements being greater than 8.0. High levels of suspended solids occur annually during snowmelt events, but typical levels are less than 70 mg/l.

Water quality was measured at Surface Water Sampling Location G-5 by both Soldier Creek Coal Company and USGS. The USGS data do not reflect as much variability as the data obtained by Soldier Creek Coal Company. TDS varied from 220 to 1,566 mg/l, with the higher concentrations generally occurring during summer months when flows were low. Most TDS concentrations were between 400 and 700 mg/l. The dominant constituents were calcium bicarbonates; however, the poorer quality samples showed increases of bicarbonates of sodium and calcium with some increase in sulfates. The pH level varies from 7.5 to 8.7 with most levels being between 7.8 and 8.2. Suspended solid concentrations were generally less than 60 mg/l, with higher levels occurring during spring and early summer.

Water in the vicinity of the Soldier Canyon Mine is typical of the regional environment. A comparison of these data with Table 3 indicates that the quality of Soldier Creek water near the mine is much better than the quality of Price River water.

VI. Potential Hydrologic Impacts

A. Groundwater

Dewatering and subsidence related to mining have the greatest potential for impacting groundwater resources in the CIA.

SUMMARY OF SELECT WATER QUALITY DATA FROM USGS STATIONS
PRICE RIVER AT WOODSIDE AND GREEN RIVER AT GREEN RIVER, UTAH

STATION NUMBER	STATION NAME	WATER YEAR	SPECIFIC CONDUCTANCE (micromhos)	pH (units)	TEMPERATURE (deg. C)	DISSOLVED SOLIDS RESIDUE at 180 (deg. C)	CALCIUM Ca	MAGNESIUM Mg	SODIUM Na	POTASSIUM K	CHLORIDE Cl	SULFATE SO_4	BICARBONATE HCO_3	IRON TOTAL Fe	IRON DISSOLVED Fe	MANGANESE TOTAL Mn	MANGANESE DISSOLVED Mn	SUSPENDED SEDIMENT
09311500	Price River at Woodside	1975-76	Min. 2,200	8.2	.0	1,070	170	85	230	7.0	31	1,000	260	-	-	-	-	43
			Max. 4,950	8.0	26.5	4,830	310	250	730	12.0	78	2,000	530	-	-	-	-	5,890
		1976-77	Min. 1,370	7.4	.0	1,150	220	16	77	7.0	15	600	170	440	10	-	8	7
			Max. 6,950	8.7	29.0	6,770	400	350	1,100	15.0	130	4,300	570	510,000	70	16,000	110	69,400
		1977-78	Min. 1,140	7.6	.0	1,290	110	79	190	4.0	22	640	40	10	10	90	10	27
			Max. 6,090	8.7	26.0	4,990	330	280	760	13.0	100	3,100	450	18,000	20	860	60	4,420
		1978-79	Min. 1,110	8.0	-	822	83	51	110	3.4	17	390	240	280	-	10	-	16
			Max. 6,540	8.6	21.5	6,240	250	320	990	17.0	110	3,700	500	46,000	-	1,300	20	5,560
		1979-80	Min. 1,090	8.0	.0	761	-	-	-	-	-	-	270	-	0	-	-	93
			Max. 5,510	8.7	23.0	5,660	-	-	-	-	-	-	520	63,000	-	2,600	10	12,200
		1980-81	Min. 2,720	8.0	.0	2,070	150	130	300	7.2	52	1,300	160	-	-	-	-	8
			Max. 4,480	8.3	24.0	3,860	250	230	640	12.0	96	2,500	330	-	-	180	-	5,200
		1981-82	Min. 1,170	8.0	.0	830	82	53	97	2.9	16	360	194	9,600	-	240	-	158
			Max. 4,080	8.3	23.5	2,880	240	210	530	8.3	90	2,100	350	24,000	-	820	-	23,800
		1982-83	Min. 830	8.2	.0	830	82	53	97	2.3	17	210	210	-	-	-	-	110
			Max. 3,920	8.4	20.0	3,580	260	220	520	8.9	79	2,200	340	36,000	-	960	-	12,300
09315000	Green River at Green River	1975-76	Min. 450	0.1	.0	276	41	15	30	1.0	7.7	110	150	570	0	30	0	32
			Max. 1,030	8.7	26.0	704	82	35	110	3.3	35	300	270	32,000	60	1,000	20	3,403
		1976-77	Min. 530	7.7	.0	335	49	19	44	2.1	15	150	160	1,300	0	30	0	
			Max. 1,520	8.7	29.0	1,210	190	43	110	7.0	33	670	300	330,000	190	7,600	20	18,(
		1977-78	Min. 300	7.9	.0	212	33	12	23	1.0	7.1	69	190	1,700	10	50	0	95
			Max. 1,070	8.5	28.5	756	81	39	120	3.5	38	350	270	21,000	40	630	10	13,400
		1978-79	Min. 300	8.0	.0	273	35	15	29	-	8	86	-	830	0	40	0	49
			Max. 1,240	8.5	28.0	852	87	42	110	9.5	41	390	330	19,000	120	500	8	47,500
		1979-80	Min. 320	7.6	.0	214	29	12	21	1.5	7.4	70	130	2,000	<10	50	1	60
			Max. 1,310	8.5	27.0	798	85	37	110	5.0	38	410	260	39,000	40	1,100	10	11,600
		1980-81	Min. 320	7.8	.0	273	47	19	50	1.8	14	160	110	1,200	<10	40	1	19
			Max. 1,200	8.3	26.0	852	82	41	110	3.7	40	350	190	27,000	30	880	10	5,780
		1981-82	Min. 290	8.0	.0	196	29	10	19	0.6	6	60	90	10,000	5	210	<1	134
			Max. 1,060	8.4	27.5	749	82	40	100	3.3	37	320	180	31,000	20	840	6	16,700
		1982-83	Min. 400	8.0	.0	494	38	15	29	-	9.3	98	111	-	6	-	3	64
			Max. 960	8.4	25.0	584	69	32	76	-	25	270	184	-	31	-	130	5,650

Notes:
Station location: see Figure 3.2-6 (Price River Drainage Basin). Constituents: in mg/l except manganese and iron, which are in micrograms/l. Specific conductance: field determination. pH: field determination.

TABLE 3.

Dewatering

Underground mining removes the support to overlying rock causing caving and fracturing of the overburden. In areas where fracturing is extensive subsidence of the overburden becomes greater. Subsidence induced caving and fracturing can expose ground water sources to lower pressures creating conduits of less resistance that allow groundwater to flow into the mine. Dewatering from fracturing may decrease aquifer storage and flow to streams and springs (Figure 5).

Currently, the volume of water being discharged from the mine (130 gpm) does not reflect the amount of water that is currently being withdrawn from the groundwater system. The withdrawal value may be somewhat less since SCCC is dewatering an area that has been sealed off. At the rate of 130 gpm an annual volume of 210 ac-ft would be discharged. This figure is significantly larger than the the 15 ac-ft per year reported by Waddel 1986 for the year 1980.

Average groundwater recharge is estimated to be 967.7 ac-ft using 5% as the average infiltration factor. Total groundwater storage was estimated by SCCC to be 490,00 ac-ft.

Future monitoring will indicate the total groundwater discharge due to mining. Even at the current rate of 130 gpm only a small portion of the annual groundwater recharge source will be intercepted.

It is not anticipated that the rate of discharge will exceed the recharge rate during this permit term. However, as mine operations expand in the future to encompass the proposed expansion area an increase in discharge is anticipated. At present, data are not available to precisely document increases in mine discharge. An estimate of discharge increase may be derived by multiplying the discharge per acre of present mine workings times the projected area of mine working.

Upon termination of mining operations, groundwater discharge to Soldier Creek will be discontinued and the mine will begin to flood. The potential reduction in surface flow that is associated with the cessation of operations may be evaluated in terms of the lag time required for reestablishment of base flow recharge.

The impact associated with the reduction in surface flow is considered temporary. Mine flooding will conceivably reestablish a system of base flow recharge that was operational prior to mining. The time span required for reestablishing base flow recharge may be estimated by dividing the final mine workings volume by the final estimated values for mine discharge.

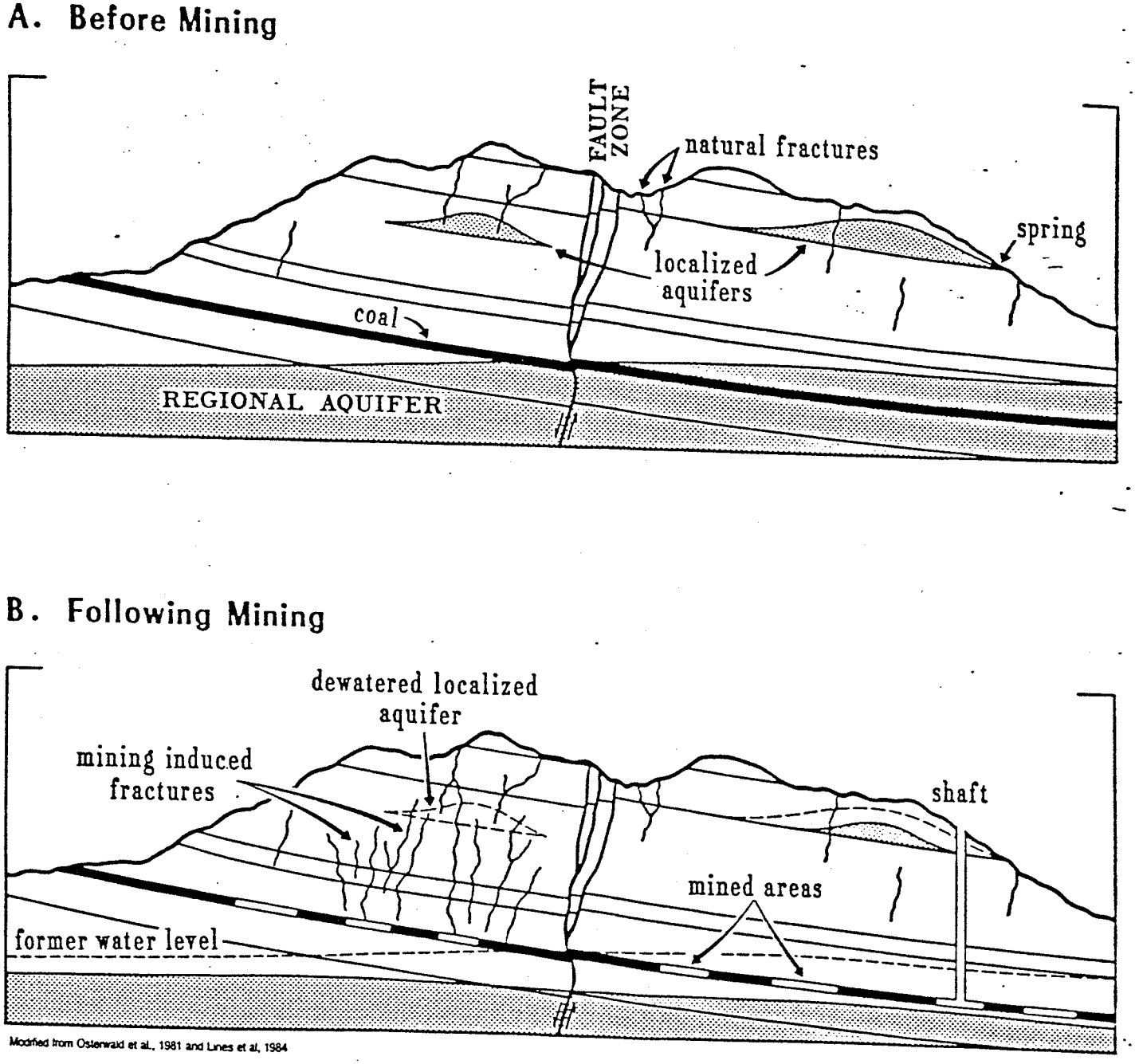


Figure 5. Potential effects of mining to overlying aquifers and strata.

The maximum lag time for mine flooding will depend on the amount of caving and the void space created from caving. Estimates can be made by making certain assumptions however, without more information the estimates would be confussing. It should be noted that complete flooding may never be achieved because the hydraulic head generated as flooding expands will also increase until the hydraulic properties of the roof, floor and rib are exceeded and flow through the rocks is initiated.

In most mining areas it is unlikely that fractures will reach perched aquifers do to the thickness of the overburden. Dewatering of any aquifers will result in inmine flow which is discharged to Soldier Creek. Water quality downstream from the mine could improve since water being discharged is of better quality than natural streamflow.

SCCC has proposed an inmine water monitoring plan that will be dynamic in nature to allow for monitoring new sites as mining progresses. The proposed groundwater monitoring program for SCCC will, in the future, allow increasing discharge rates to be more precisely characterized and thereby, achieve a more accurate assessment of mining related dewatering impacts.

Subsidence

Subsidence impacts are largely related to extension and expansion of the existing fracture system and upward propagation of new fractures (Figure 6). Inasmuch as vertical and lateral migration of water appears to be partially controlled by fracture conduits, readjustment or realignment in the conduit system will inevitably produce changes in the configuration of ground-water flow. Potential changes include increased flow rates along fractures that have "opened" and diverting flow along new fractures or within permeable lithologies. Subsurface flow diversion may cause the depletion of water in certain localized aquifers and potential loss of flow to springs that will be undermined . Increased flow rates along fractures would reduce groundwater residence time and potentially improve water quality.

No subsidence has been recorded over the current mine permit area. The presence of the Castlegate Sandstone in conjunction with overburden thickness is apparently responsible for reduced surface subsidence. Additional mining during the five-year permit term will occur beneath 500-2,000 feet of overburden. The potential for subsidence related surface impacts (e.g., ponding) to the subsurface and surface hydrologic regimes are not considered significant. The operator is currently drafting plans to implement an aereal subsidence survey on an annual basis using the photogrammetric method. Annual subsidence reports will be generated and provided to the regualtory authority.

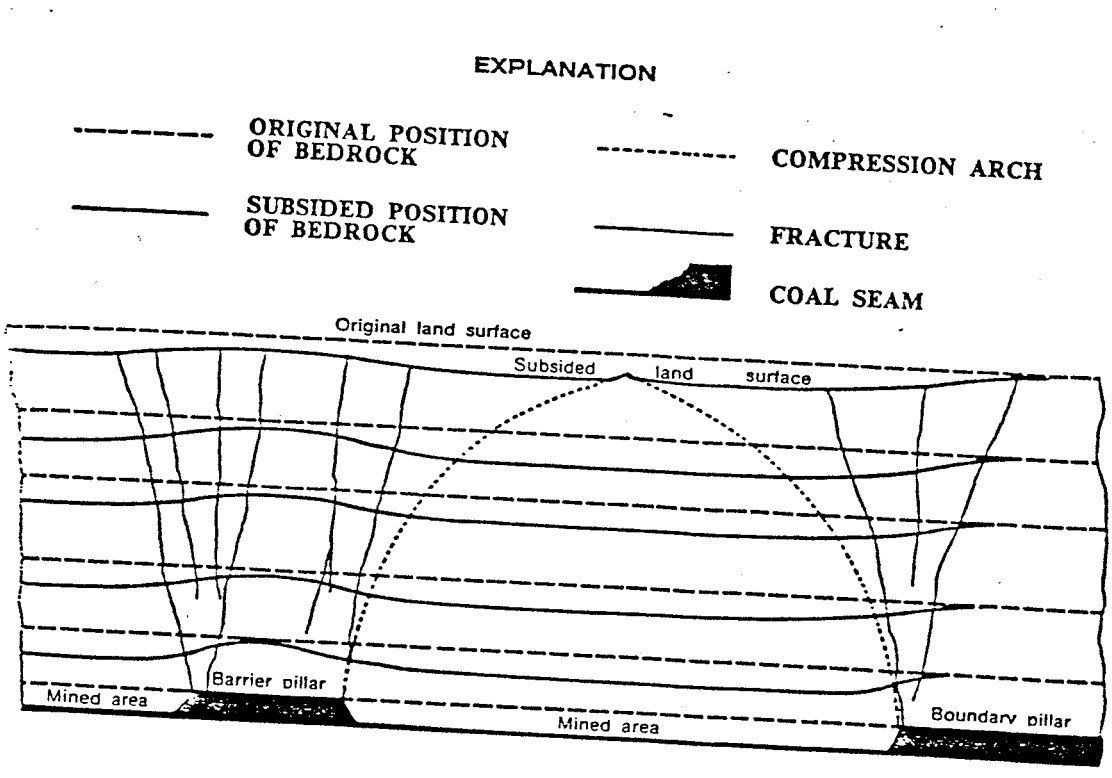


Figure 6. Generalized cross section showing subsidence and and fracturing that occurs above an underground coal mine (From Dunrud, 1976)

Mine water is presently directed to a sediment pond and then released to Soldier Creek at NPDES discharge point #003. The treatment associated with these ponds improves suspended solids and oil and grease parameter values, but overall total dissolved solids (TDS) values remain in the range of 1500 mg/l at the discharge point. Future impacts from mine water discharge is not anticipated to increase from present levels. The quantity of mine water may increase, causing increased TDS levels downstream and suspended solid values will decrease as sediment controls are implemented in problem areas.

B. Surface Water

An NPDES permit issued by EPA presently allows for one ton of dissolved solids per day to be discharged from the mine into Soldier Creek. Continuation of Soldier Creek Coal Company's monitoring program will verify water consumption and discharge estimates.

The quality of the local surface waters can be changed by two basic processes. First, the runoff from the operator's disturbed lands and waste piles could increase sediment concentrations and alter the distribution and concentration of dissolved solids in the receiving streams. This potential for inducing water quality changes has been fully recognized, and the runoff control plan established for the mine is adequate in anticipating, mitigating and monitoring the potential impacts. The second potential cause of surface water quality changes is related to the location and water chemistry of groundwater discharges, both natural and planned by the operator.

As discussed by Waddell et al (1986), the perennial flow of Soldier Creek is sustained by spring or seepage discharges from the various sedimentary formations. This perennial flow is dominated by the high volume of spring discharges from the Flagstaff Limestone during spring and early summer snowmelt. At other times of the year, the discharge contributions from the Flagstaff Limestone is greatly reduced and seepage from the underlying formations sustains the base flow of the stream. Generally, the total dissolved solids (TDS) concentration of spring water emanating from the Flagstaff Limestone is lower than the TDS of the underlying groundwater in the North Horn and Blackhawk Formations. As presented by Waddell et al (1986), the upper segment of the stream flow in Pine Creek contains water which emanates from the Flagstaff Limestone, possesses a TDS of 300 to 400 mg/l, and is dominated by the ions of magnesium, calcium and bicarbonate. In contrast, the lower reaches of Soldier Creek, which receives seepage contributions from the North Horn, Price River, Castlegate and Blackhawk Formations, has a TDS ranging from about 500 to 600 mg/l and is dominated by the ions of sodium, magnesium and sulfate.

To qualitatively address the possible consequences of mining upon the quality of the surface flows of Soldier Creek is both a spatial and temporal problem. During periods of high discharge caused by summer thunderstorm precipitation or snowmelt, the effects of redistributing seepage contributions and direct mine discharge to the stream are negligible in respect to the natural processes of sediment transport and controlling water chemistry. During other periods, however, the lessening of seepage contributions caused by the redistribution of flow by the underground workings will cause the water quality of the upper reaches of the drainage network to become more dominant farther downstream, even though the baseflow would be less.

At and below the point of mine discharge, the overall effect of constantly disposing groundwater from the mine workings is one of adjusting the water chemistry to one dominated by the groundwater quality of the Blackhawk Formation. At periods of low base flow, there would appear to be little variation between the water quality of the natural stream flow and the mine discharge. Obviously, the mine discharge would result in a higher rate of flow in the stream than normally experienced during dry periods when the stream is normally sustained by limited spring contributions.

Waddell et al (1986) describe the stream bed characteristics of Soldier Creek in some detail. Due to the apparent saturation of the natural waters with respect to calcite, the bed of Soldier Creek downstream from Pine Canyon contains alluvium which is cemented with carbonate precipitates. It is possible that the degree of this cementation may increase as a result of mining due to the possible dominance of the calcium bicarbonate waters in the stream flow should the waters of the formations underlying the Flagstaff Limestone be redistributed and diverted downstream. Wadedell et al (1986) suggested that the diversity of benthic invertebrates may be affected by the cementation process.

C. Alluvial Valley Floors

A negative determination has been made based on the studies of conducted by Sunedco Coal Company to the approved Sage Pint-Dugout Canyon mine plan on the existance of unconsolidated streamlaid deposits holding streams and sufficient water to support agricultural activities within the mine plan area. A potential AVF exists downstream along Soldier Creek.

VII. Summary

The probable hydrologic impacts are summarized below under the headings entitled First Five Year Permit Term and Future Mining.

First Five Year Permit Term

The rate of dewatering will remain significantly less than the estimated recharge rate during the first five year permit term. Overburden thickness will be sufficient (500-2,000 feet) to restrict surface manifestations of subsidence. The subsurface propagation of fractures may produce changes in groundwater flow that could affect localized aquifers and springs. Future monitoring will provide data applicable to documenting changes in the groundwater system.

Surface disturbance and the addition of mine water have not significantly degraded water quality in Soldier Creek. Sediment control measures have served to reduce contaminants and stabilize water quality at acceptable levels.

NO AVF will be impacted during the first five year permit term by additional flow from increased mine water discharge.

Future Mining

Increased rates of dewatering may, in the future, result in depletion of groundwater storage. Depletion of storage may terminate certain spring flow and base flow recharge to streams. Upon cessation of mining, mine water discharge to Soldier Creek will be discontinued. However, this affect is considered temporary because mine flooding will probably result in reestablishment of the preexisting groundwater system that, most likely, provided base flow recharge.

Drainage from future surface disturbance will be managed through appropriate sediment controls. Future mine discharge will be directed through the existing sediment pond.

At the termination of mining, the downstream AVF will experience decreased flow. The duration and extent of this impact cannot be accurately assessed at this time. However, flow rates may be partially to fully restored when the groundwater system is reestablished.

The operational design proposed for the Soldier Canyon Mine is herein determined to be consistent with preventing damage to the hydrologic balance outside the mine plan area based on the accracy of the information submitted in the mine plan and referenced literature.

REFERENCES

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Kaiser Coal Corporation, Application for an Underground Coal Mine Permit, March 1, 1985, Sunnyside Mine, Sunnyside, Utah.

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Mundorff, J. C., 1972. Reconnaissance of chemical quality of surface water and fluvial sediment in the Price River Basin, Utah. UT Depart. Nat. Res., Div. Water Rights, Tech. Publ. No. 39, Salt Lake City, UT.

Osterwald, F. W., et al. 1981. Bedrock, surficial and economic geology of the Sunnyside coal mining district, Carbon and Emery counties, Utah: Geol. Surv., Professional Paper 1166.

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Waddell, K. M., et al. 1978. Selected hydrologic data, 1931-77, Wasatch Plateau-Book Cliffs coal fields area, Utah: Utah Basic Data Release No. 31, U. S. Geol. Surv., Open-File Report 78-121.

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Waddell, K. M. et al. 1986. Hydrology of the Price River Basin, Utah, with emphisis on selected coal-field areas. U. S. Geo. Surv., Water Supply Paper 2246.

Winget, R. N. 1980. Aquatic resource analysis of Grassy Trail Creek, Carbon County, Utah

1098R

TECHNICAL ANALYSIS

Soldier Creek Coal Company
Soldier Canyon Mine
Lease ML-44365 Addition
ACT/007/018
Carbon County, Utah

August 8, 1989

UMC 817.59 Coal Recovery - DD

Existing Environment and Applicant's Proposal

Soldier Creek Coal Company submitted development plans in their Mining and Reclamation Plan (MRP) for the state Lease ML-44365 as early March of 1986. On May 10, 1989 the MRP was determined complete.

The lease will be mined by underground mining methods using room and pillar type mining. Pillar sizing and strength calculations were submitted on May 15, 1989 which indicate that the pillars and roof span are adequate to support the overlying rock. A static safty factor of two (2) for overburden up to 2000 feet thick was calculated for the pillar sizes to be used. The extraction ratio is 0.4375 for pillars 60 feet by 60 feet and using 20 feet enteries (Figures 4.2-2 and 4.4-3 from June 9, 1989 mid-term review submittal). Extraction is planned for not more than two seams over the lease area.

Compliance

The information supplied by the operator indicates a measure of roof support in excess of the overburden in the vicinity of mining. Long term affects of subsidence are expected to be minimized with use of support pillars.

Any subsidence that happens to take place should be gradual and occur over several decades. Subsidence fractures would not be expected to reach the surface with the thickness of overburden on the lease. If subsidence should take place under the stream channel, it is expected that it would happen gradually so that the gradient of the stream would be maintained by sediment deposition.

Stipulations

None.

UMC 817.121 - .126 Subsidence Control - DD

Existing Environment and Applicant's Proposal

The subsidence potential was examined for the lease and especially where mining will take place under perennial streams. Overburden thickness is 1100 feet to 1250 feet thick (see Map E 032 in the MRP). A buffer zone is established along perennial streams and roads using a 25 degree angle of draw. No secondary mining will take place with in the buffer zone.

Subsidence monitoring stations exist on site with a consentration of monuments along Soldier Creek. Soldier Creek Coal Company will install another subsidence monitoring station in the vicinity of the confluence of Pine Creek and Soldier Creek. Subsidence monitoring will be carried out on an annual basis and will entail direct and visual surveys.

Spring, stream and in-mine water monitoring is being conducted to establish any effects from subsidence on surface and ground water conditions.

Compliance

The operator has provided safty designs and established monitoring systems and techniques to evaluate any degradation to existing renewable resources over the lease area.

Stipulations

None.

BT242/1-12

LETTERS OF CONCURRENCE

Soldier Creek Coal Company
Soldier Canyon Mine
Lease ML-44365 Addition
ACT/007/018
Carbon County, Utah

August 8, 1989

File ACT/007/018 #2

State of Utah

Division of State History
(Utah State Historical Society)
Department of Community and Economic Development

Norman H. Bangerter
Governor
Max J. Evans
Director

300 Rio Grande
Salt Lake City, Utah 84101-1182
801-533-5755

May 26, 1989

Mr. Lowell P. Braxton
Associate Director, Mining
Division of Oil, Gas and Mining
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Determination of Completeness, New Lease ML-44365, Soldier Creek Coal Co., Soldier Canyon Mine, ACT/007/018, Folder #2, Carbon County, Utah

In Reply Please Refer to Case No. I822

Dear Mr. Braxton:

The Utah State Historic Preservation Office received the above referenced documentation on May 16, 1989. We understand that no new facilities will be constructed on the ground surface. Therefore, there will be no impacts to cultural resources as a result of this new lease.

This information is provided on request to assist the Division of Oil, Gas and Mining with its Section 106 responsibilities as specified in 36 CFR 800 or in complying with Utah Code, Title 63-18-37. If you have questions or need additional assistance, please contact me at (801) 533-7039.

Sincerely,

Diana Christensen
Regulation Assistance Coordinator

DC:I822/7065V OR/NP

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

August 8, 1989

TO: Susan C. Linner

FROM: Joseph C. Helfrich

RE: Compliance Review for Section 510(c) Finding, Soldier Creek Coal Company, Soldier Canyon Mine, ACT/007/018, Carbon County, Utah

As of the writing of this letter, there are no NOV's or CO's which are not corrected or in the process of being corrected. Any NOV's or CO's that are outstanding are in the process of administrative or judicial review. There are no finalized Civil Penalties which are outstanding and overdue in the name of Soldier Creek Coal Company.

Finally, they do not have a demonstrated pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

jb
MN47/48

/read all

Message 603-928
Subj: Joe Helfrich, UT SRA

UT8.08

AVS CLEARINGHOUSE RECOMMENDATION

Pending Application Number ACT007018, SOLDIER CREEK COAL CO., has been researched, and the AVS Clearinghouse recommendation is ISSUE.

cc: Gary Fritz, Albuquerque Field Office

[PC ID 20:DOI370025:56032]

152E for 152G22 11:20 MDT 08-Aug-89 Message 603-928 [1]
* RECEIPT notice pending *

Receipt of Message 603-928 acknowledged to 152E on 14:44 MDT 08-Aug-89
Action?:
End for ATtention, Home to SWitch ; Capture Off ; Numeric

FEDERAL
(April 1987)

Permit Number ACT/007/018, August 8, 1989
(Revised)

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
(801) 538-5340

This permit, ACT/007/018, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (DOGM) to:

Soldier Creek Coal Company
P. O. Box I
Price, Utah 84501
(801) 637-6360

for the Soldier Canyon Mine. Soldier Creek Coal Company is the lessee of federal coal leases SL-051279-063188, U-50722, and the lessee of state coal leases ML-22675, ML-21994, ML-42648, ML-42649, and ML-44365. A performance bond is filed with the DOGM in the amount of $577,000.00, payable to the state of Utah, Division of Oil, Gas and Mining and the Office of Surface Mining Reclamation and Enforcement (OSMRE). DOGM must receive a copy of this permit signed and dated by the permittee.

Sec. 1 STATUTES AND REGULATIONS - This permit is issued pursuant to the Utah Coal Mining and Reclamation Act of 1979, Utah Code Annotated (UCA) 40-10-1 et seq, hereafter referred to as the Act.

Sec. 2 PERMIT AREA - The permittee is authorized to conduct underground coal mining activities on the following described lands (as shown on the map appended as Attachment A) within the permit area at the Soldier Canyon Mine situated in the state of Utah, Carbon County, and located:

Township 13 South, Range 12 East, SLBM

Section 4: All
Section 5: All
Section 6: All
Section 7: All
Section 8: All
Section 9: W1/2, NE1/4, N1/2SE1/4
Section 17: N1/2
Section 18: N1/2N1/2, SE1/4NE1/4, S1/2NW1/4, NE1/4SW1/4NE1/4, NW1/4SW1/4NE1/4
Section 19: Portion of SW1/4SW1/4

Township 12 South, Range 12 East, SLBM

Section 32: NW1/4, SW1/4NE1/4, E1/2NE1/4, S1/2

Township 13 South, Range 11 East, SLBM

Section 12: E1/2, E1/2W1/2
Section 13: N1/2NE1/4, NE1/4NW1/4, SE1/4NE1/4, NE1/4SE1/4
Section 24: S1/2S1/2SW1/4SE1/4, Portion of SE1/4SE1/4
Section 25: N1/2NW1/4NE1/4

This legal description is for the permit area (as shown on Attachment A) of the Soldier Canyon Mine. The permittee is authorized to conduct underground coal mining activities on the foregoing described property subject to the conditions of the leases, including all conditions and all other applicable conditions, laws and regulations.

Sec. 3 PERMIT TERM - This revised permit becomes effective on August 8, 1989 and expires on February 3, 1992.

Sec. 4 ASSIGNMENT OF PERMIT RIGHTS - The permit rights may not be transferred, assigned or sold without the approval of the Director, DOGM. Transfer, assignment or sale of permit rights must be done in accordance with applicable regulations, including but not limited to 30 CFR 740.13(e) and UMC 788.17-.19.

Sec. 5 RIGHT OF ENTRY - The permittee shall allow the authorized representative of the DOGM, including but not limited to inspectors, and representatives of OSMRE, without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay to:

A. have the rights of entry provided for in 30 CFR 840.12, UMC 840.12, 30 CFR 842.13 and UMC 842.13; and,

B. be accompanied by private persons for the purpose of conducting an inspection in accordance with UMC 842.12 and 30 CFR 842, when the inspection is in response to an alleged violation reported by the private person.

Sec. 6 SCOPE OF OPERATIONS - The permittee shall conduct underground coal mining activities only on those lands specifically designated as within the permit area on the maps submitted in the mining and reclamation plan and permit application and approved for the term of the permit and which are subject to the performance bond.

Sec. 7 ENVIRONMENTAL IMPACTS - The permittee shall minimize any adverse impact to the environment or public health and safety through but not limited to:

A. accelerated monitoring to determine the nature and extent of noncompliance and the results of the noncompliance;

B. immediate implementation of measures necessary to comply; and

C. warning, as soon as possible after learning of such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.

Sec. 8 DISPOSAL OF POLLUTANTS - The permittee shall dispose of solids, sludge, filter backwash or pollutants in the course of treatment or control of waters or emissions to the air in the manner required by the approved Utah State Program and the Federal Lands Program which prevents violation of any applicable state or federal law.

Sec. 9 CONDUCT OF OPERATIONS - The permittee shall conduct its operations:

A. in accordance with the terms of the permit to prevent significant, imminent environmental harm to the health and safety of the public; and

B. utilizing methods specified as conditions of the permit by DOGM in approving alternative methods of compliance with the performance standards of the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 10 AUTHORIZED AGENT - The permittee shall provide the names, addresses and telephone numbers of persons responsible for operations under the permit to whom notices and orders are to be delivered.

Sec. 11 COMPLIANCE WITH OTHER LAWS - The permittee shall comply with the provisions of the Water Pollution Control Act (33 USC 1151 et seq,) and the Clean Air Act (42 USC 7401 et seq), UCA 26-11-1 et seq, and UCA 26-13-1 et seq.

Sec. 12 PERMIT RENEWAL - Upon expiration, this permit may be renewed for areas within the boundaries of the existing permit in accordance with the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 13 CULTURAL RESOURCES - If during the course of mining operations, previously unidentified cultural resources are discovered, the permittee shall ensure that the site(s) is not disturbed and shall notify DOGM. DOGM, after coordination with OSMRE, shall inform the permittee ofnecessary actions required. The permittee shall implement the mitigation measures required by DOGM within the time frame specified by DOGM.

Sec. 14 APPEALS - The permittee shall have the right to appeal as provided for under UMC 787.

Sec. 15 SPECIAL CONDITIONS - In addition to the general obligations and/or requirements set out in the leases and this permit, the permittee shall comply with any special conditions appended hereto.

The above conditions (Secs. 1-15) are also imposed upon the permittee's agents and employees. The failure or refusal of any of these persons to comply with these conditions shall be deemed a failure of the permittee to comply with the terms of this permit and the lease. The permittee shall require his agents, contractors and subcontractors involved in activities concerning this permit to include these conditions in the contracts between and among them. These conditions may be revised or amended, in writing, by the mutual consent of DOGM and the permittee at any time to adjust to changed conditions or to correct an oversight. DOGM may amend these conditions at any time without the consent of the permittee in order to make them consistent with any new federal or state statutes and any new regulations.

THE STATE OF UTAH

By: Dianne R. Nielson

Date: 8/8/89

I certify that I have read, understand and accept the requirements of this permit and any special conditions attached.

Authorized Representative of
the Permittee

Date: _____

APPROVED AS TO FORM:

By: Ralph H Funderson
Assistant Attorney General

Date: August 4, 1989

WPOB242/13-17

ATTACHMENT A

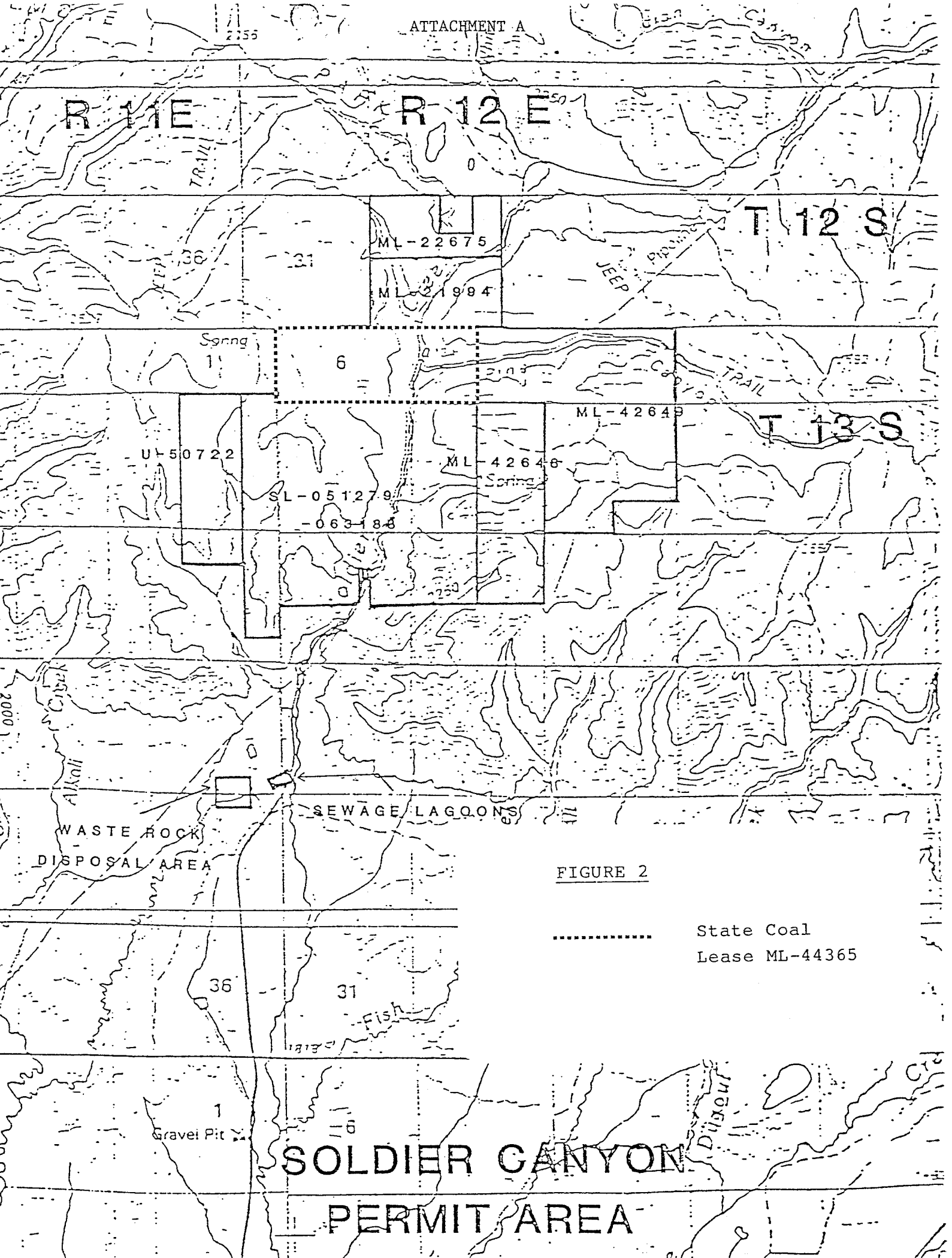

FIGURE 2

..... State Coal Lease ML-44365

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

May 19, 1989

Mr. J. Thomas Paluso
Soldier Creek Coal Company
P. O. Box I
Price, Utah 84501

Dear Mr. Paluso:

Re: Final Approval, Amendment, Incidental Boundary Change, Soldier Creek Coal Company, Soldier Canyon Mine, ACT/007/018-89(A), Folder #3, Carbon County, Utah

The submittals received April 17 and May 17, 1989 regarding the above noted permitting action were reviewed and found to be complete and adequate by Dave Darby, Reclamation Geologist of the Division's technical staff.

The Division hereby approves the above referenced action. Thank you for your cooperation in this matter.

If you have any questions, please call James Leatherwood or me.

Sincerely,

Susan C. Linner

Susan C. Linner
Reclamation Biologist/
Permit Supervisor

cl
cc: J. Helfrich
J. Leatherwood
BT45/235

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

May 10, 1989

Newspaper Agency Corporation
Legal Advertising
143 South Main - Mezzanine Floor
Salt Lake City, Utah 84110

Ladies and Gentlemen:

Re: Notice of Permit Approval - ACT/007/018, Folder No. 3, Carbon County, Utah

Enclosed is a Notice of Permit Approval rendered by the Division of Oil, Gas and Mining, Department of Natural Resources, state of Utah.

It is requested that this notice be published ONCE ONLY, as soon as possible.

Upon completion of this request, please send proof of publication and statement of cost to the Division of Oil, Gas and Mining, 3 Triad Center, Suite 350, 355 West North Temple, Salt Lake City, Utah 84180-1203.

Sincerely,

Lowell P. Braxton
Associate Director, Mining

cl
Enclosures
cc: S. Linner
BT68/33

NOTICE OF PERMIT APPROVAL

To Whom It May Concern:

Pursuant to the Utah Coal Mining and Reclamation Act (Utah Code Annotated 1953, Section 40-10-1 et seq), and the "Regulations Pertaining to Surface Effects of Underground Coal Mining Activities" (Final Rules of the Utah Board of Oil, Gas and Mining), the Utah Division of Oil, Gas and Mining has issued a revised permit for New State Lease ML-44365 to Soldier Creek Coal Company, for its permit application No. ACT/007/018. The Company will conduct mining activities in accordance with the approved Mining and Reclamation Plan for the Soldier Canyon lease addition associated with the following lands:

Township 13 South, Range 12 East, SLBM

Section 5: SW 1/4, Lots 3 and 4
Section 6: All

The revised permit was issued by the Utah Division of Oil, Gas and Mining on August 8, 1989. A copy of the permit, the Decision Document and Technical Analysis is on file at the following location:

Division of Oil, Gas and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203
(801) 538-5340

Anyone having comments pertaining to the Soldier Canyon Mine should contact Dr. Dianne R. Nielson, Director, Utah Division of Oil, Gas and Mining, at the address referenced above.

BT68/34

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

April 19, 1989

Mr. J. Thomas Paluso
Chief Engineer
Soldier Creek Coal Company
P. O. Box I
Price, Utah 84501

Dear Mr. Paluso:

Re: Final Approval, Amendment to 1988 Exploration Plan, Soldier Creek Coal Company, Soldier Canyon Mine, ACT/007/018, Folder #3, and CEP/007/018, Carbon County, Utah

The submittal received April 17, 1989 regarding the above noted exploration action was reviewed and found to be complete and adequate by the Division's technical staff. In addition, the Bureau of Land Management has given verbal concurrence with this proposed action (personal communication with John Miley, April 18, 1989).

Material removed during the excavation should be analyzed for toxicity, since it is proposed to be used as fill material. Please contact James Leatherwood, Reclamation Soils Specialist for specific analyses to be done.

The Division hereby approves the above referenced action. Thank you for your cooperation in this matter.

If you have any questions, please call Randy Harden or me.

Sincerely,

Susan C. Linner

Susan C. Linner
Reclamation Biologist/
Permit Supervisor

cl
cc: M. Bailey, BLM, Price River Resource Area
J. Helfrich
J. Leatherwood
BT45/212

File ACT/007/018 #3

SC3 SOLDIER CREEK COAL CO.

Telephone (801) 637-6360

P.O. Box I
Price, Utah 84501

March 2, 1989

Ms. Susan C. Linner
Permit Supervisor
Utah Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84130-1203

RE: Banning Loadout
Permit Stipulations/Certified Drawings
ACT/007-034

Dear Susan:

Enclosed you will find fourteen (14) copies of the information requested on December 21, 1989.

I am sorry about the delays and hope this information answers all the stipulations. Water monitoring data for 1988 was included so that we, as discussed over the telephone, could consider this the annual report for 1988.

Thank you for your patience and if you have any further questions, please contact me.

Sincerely,

SOLDIER CREEK COAL COMPANY

J.T. Paluso
Chief Engineer

JTP/lss
Enclosure