State Decision Document

Canyon Fuel Company, LLC
North Lease
Skyline Mine
C/007/005-SR02I

December 2, 2002

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

Canyon Fuel Company, LLC.
North Lease Extension
Skyline Mine
C/007/005

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* Findings, dated December 2, 2002

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* Decision Notice and Finding of No Significant Impact for Winter Quarters Tract, dated January 23,1996

* Determination of Completeness, September 30, 2002

* Affidavits of Publication (Emery County Progress and Sun Advocate)

* AVS Recommendation , dated November 26, 2002

* BLM Lease, Issued September 1, 1996

* Letters of Concurrence & Consultation
    USFWS, letter dated November 25, 2002
    SHPO, e-mail dated November 15, 2002
    BLM, R2P2 recommendation, letter dated November 27, 2002
    Forest Service, Concurrence Letter, letter dated November 21, 2002

ADMINISTRATIVE OVERVIEW

Canyon Fuel Company, LLC
North Lease Extension
Skyline Mine
C/007/005
Carbon County, Utah

December 2, 2002

PROPOSAL:

Canyon Fuel Company, LLC proposes to add the North Lease extension to the Skyline Mine. Mining in the North Lease was contemplated earlier in 1995, but was withdrawn when the mine plan went south. This lease will add 3291 acres to the existing mine and will add several years to the life of the mine. There are no surface facilities or disturbances planned for the North Lease Extension area. The lease will be accessed via the underground works and mining will be conducted using continuous miners for development and then longwall for full extraction. Mining will occur in the Lower O'Conner A seam. It is anticipated that the mine will produce nominally four (4) million tons of coal per year.

BACKGROUND:

The Mining and Reclamation Plan (MRP) for the Skyline Mine was originally approved by the Office of Surface Mining Reclamation and Enforcement (OSMRE) on June 20, 1980. The Permittee was Coastal States Energy Company and the Operator was Utah Fuel Company. On July 20, 1984 a revised permit was issued which authorized the use of a waste rock disposal site near the town of Scofield. On March 28, 1985 the Division of Oil Gas and Mining (DOGM) and OSM determined that the permit would expire on April 30, 1987 five years from the date of initial operations, and notified the Operator accordingly. The Permittee submitted a timely application for permit renewal in 1986.

Due to numerous problems in formatting and technical issues associated with the original MRP, the mine operated under short-term permits from April 30, 1987 to December 1, 1989 when a renewal was issued. That renewed permit was scheduled to expire on April 30, 1992, ten years from the date of initial operations. On December 31, 1991 Coastal States Energy Company submitted another application for permit renewal which included an updated Mining and Reclamation Plan formatted to the new R614 (R645) regulations. The permit was renewed on May 1, 1992. The permit was transferred from Coastal States Energy Company to Canyon Fuel Company, LLC on December 20, 1996.

The renewed permit for an additional five-year period until April 30, 1997 was conditioned upon satisfactorily complying with a Division Order that required additional PHC information. This condition was met on October 3, 1997.

The original application for the Winter Quarters lease was submitted in November 1996 and withdrawn in September 1997. A 28-acre IBC on fee land was approved on August 25, 2000. A fee lease to increase the permit area by 459 acres was approved on April 24, 2001. The permit was renewed on April 30, 2002 with five conditions.

In 2001 Canyon Fuel started to encounter significant amounts of water in the mine. This prompted them to move their mining efforts toward the North Lease. In order to access the North Lease, the company applied for an 84 acre Incidental Boundary Change on a fee lease which was approved on August 16, 2002.

The Skyline mine plan area (including the North Lease) incorporates federal coal leases and one Carbon County coal lease (10,374 acres of permit area with 79.12 acres of surface disturbance). The surface disturbed area includes disturbances (surface facilities) on Forest Service lands and private land (Unit Train Loadout and Waste Rock Disposal sites). The access to the Waste Rock Disposal Pit is a private road and is not scheduled for reclamation.

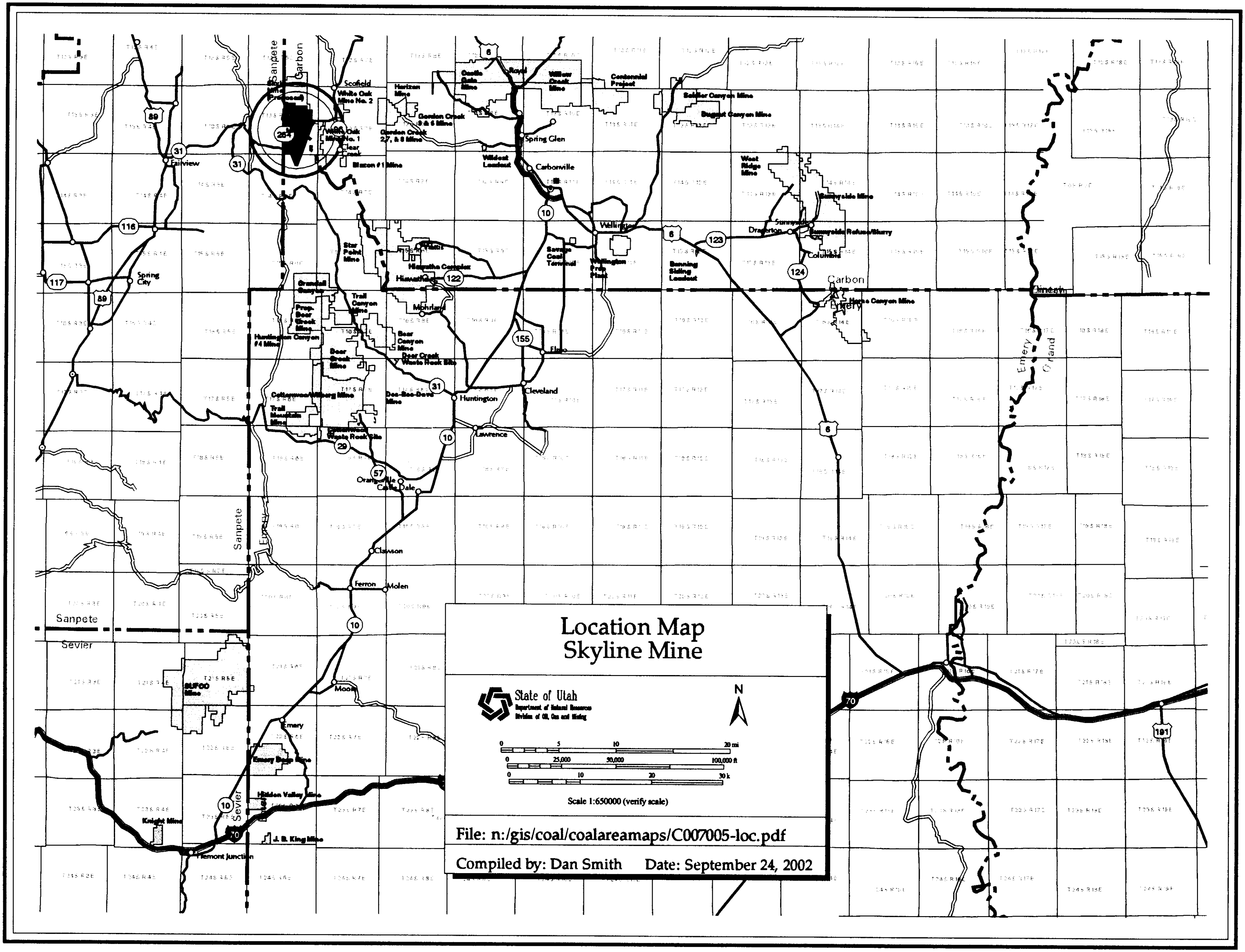
ANALYSIS:

The Division of Oil Gas and Mining has conducted an Administrative and Technical Analysis of the proposed mine Permit Application Package and has produced a written TA. All appropriate State and Federal agencies have been consulted regarding this proposal. It has been determined that the Applicant has the legal right to enter and conduct mining operations in the proposed permit area through acquired leases. The probable hydrologic consequences of the action have been analyzed and a Cumulative Hydrologic Impact Assessment (CHIA) has been prepared. All requirements for public participation have been satisfied. The application meets the requirements of the Utah Coal Regulatory Program.

RECOMMENDATION:

This recommendation is based on the complete permit application package (PAP), the Technical Analysis (TA) conducted by the Division, the Cumulative Hydrologic Impact Assessment CHIA also prepared by the Division, and the administrative record. Canyon Fuel Company, LLC has demonstrated that mining within the permit boundary can be done in conformance with the Surface Mining Control and Reclamation Act, and the corresponding Utah Act and performance standards. The 510 (c) report on the Applicant Violator System was verified for this mine on November 26, 2002 and there are no violations.

It is recommended that approval be given for the North Lease Extension to the Skyline Mine with the conditions summarized as Attachment A to the Permit.



Location Map
Skyline Mine
State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
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Scale 1:650000 (verify scale)
File: n:/gis/coal/coalareamaps/C007005-loc.pdf
Compiled by: Dan Smith
Date: September 24, 2002
Sanpete
Carbon
Emery
Grand
Sevier
Scofield
White Oak Mine No. 2
White Oak Mine No. 1
Clear Creek
Horizon Mine
Gordon Creek 3 & 6 Mine
Gordon Creek 2,7, & 8 Mine
Castle Gate Mine
Royal
Willow Creek Mine
Centennial Project
Soldier Canyon Mine
Dugout Canyon Mine
Spring Glen
Carbonville
Wildcat Loadout
Beaver #1 Mine
Fairview
Spring City
West Ridge Mine
Sunnyside Mine
Sunnyside
Sunnyside Refuse/Slurry
Dragerton
Columbia
Wellington
Wellington Prep Plant
Savage Coal Terminal
Banning Siding Loadout
Star Point Mine
Hiawatha Complex
Hiawatha
Crandall Canyon
Trail Canyon Mine
Prop. Bear Creek Mine
Huntington Canyon #4 Mine
Bear Canyon Mine
Deer Creek Waste Rock Site
Bear Creek Mine
Mohrland
Horse Canyon Mine
Elmo
Cleveland
Huntington
Cottonwood/Wilberg Mine
Des-Bee-Dove Mine
Trail Mountain Mine
Cottonwood Waste Rock Site
Lawrence
Orangeville
Castle Dale
Clawson
Ferron
Molen
Moore
Emery
SUFCO Mine
Emery Deep Mine
Hidden Valley Mine
Knight Mine
J. B. King Mine
Fremont Junction
89
31
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124
122
155
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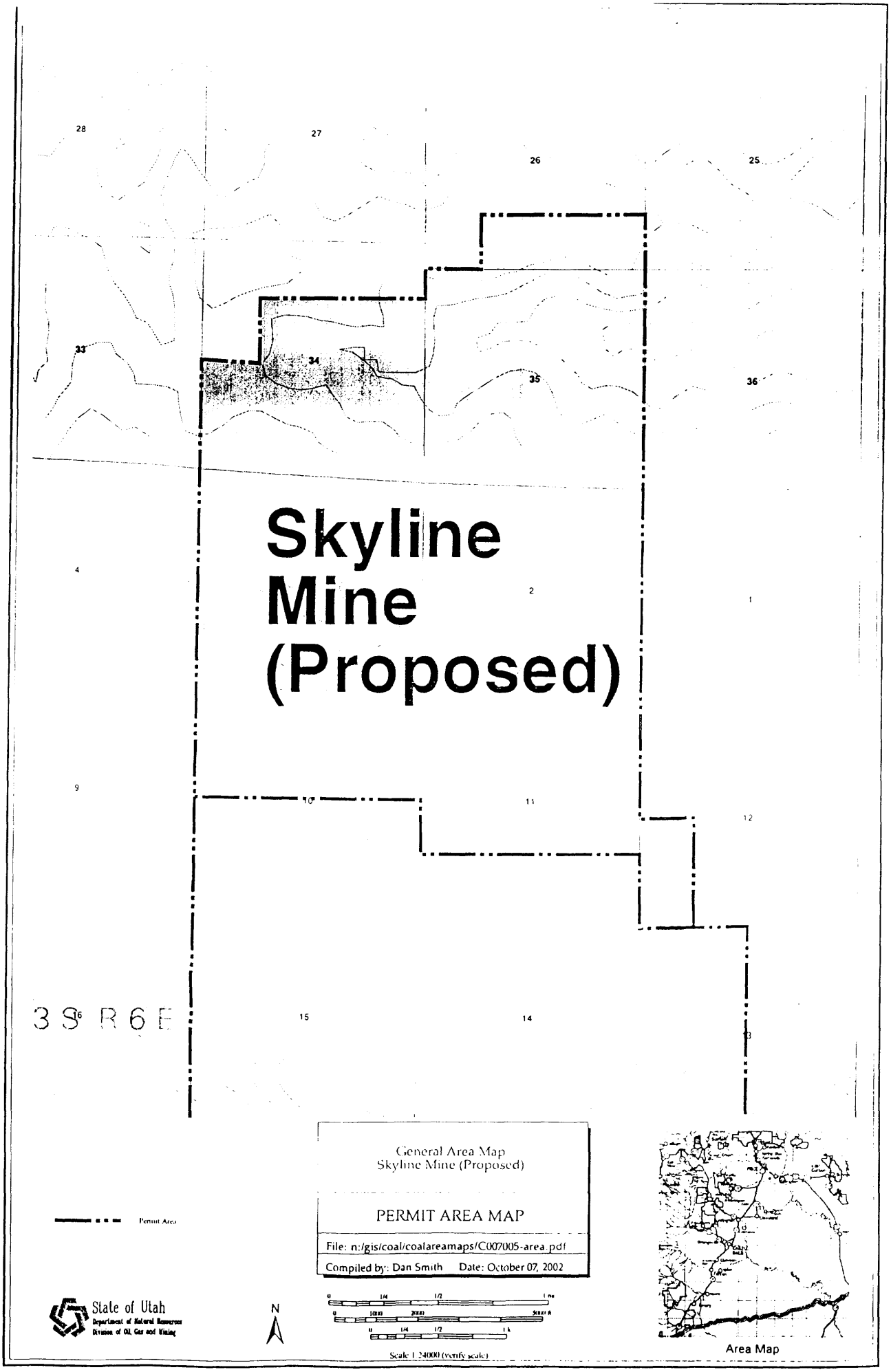
57
70
191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Skyline
Mine
(Proposed)
4
2
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11
12
3 S 6 R 6 E
15
14
Permit Area
General Area Map
Skyline Mine (Proposed)
PERMIT AREA MAP
File: n:/gis/coal/coalareamaps/C007005-area.pdf
Compiled by: Dan Smith Date: October 07, 2002
State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
N
Scale 1:24000 (verify scale)
Area Map

PERMITTING CHRONOLOGY

Canyon Fuel Company, LLC
North Lease Extension
Skyline Mine
C/007/005
Carbon County, Utah

December 2, 2002

September 4, 2002	Canyon Fuel Company, LLC , Inc. submits the permit application package for adding the North Lease (Winter Quarters)Tract to the Skyline Mine.
September 30, 2002	The permit application was determined administratively complete. Canyon Fuel Company, LLC is instructed to publish a Notice of Complete Application in the local newspaper and place a copy of the application in the county courthouse.
October 16, 2002	The Division sent letters to state, federal and local planning agencies notifying them of the complete permit application and soliciting their comments.
October 3, 10, 17, and 24, 2002	This permitting action, intent to add the North Lease (Winter Quarters) Tract to the Skyline Mine, is published in the Sun Advocate for four consecutive weeks.
October 8, 15, 22, and 29, 2002	This permitting action, intent to add the North Lease (Winter Quarters) Tract to the Skyline Mine, is published in the Emery County Progress for four consecutive weeks.
October 22, 2002	Division completes a technical review of the application and sends a draft Technical Analysis to the applicant identifying deficiencies that need to be corrected.
October 31, 2002	Division meets with the Emery County Water Users and Canyon Fuel Company, LLC to discuss PHC and CHIA for the Skyline Mine.
November 4, 2002	Canyon Fuel Company, LLC responds to deficiencies.

November 13, 2002	Division meets with the Carbon County Water Users and Canyon Fuel Company, LLC to discuss PHC and CHIA for the Skyline Mine.
November 15, 2002	SHPO concurs by e-mail with the recommendation that No Historic Properties will be impacted with the development of the North Lease at the Skyline Mine.
November 18, 2002	Canyon Fuel Company, LLC submits more responses to deficiencies.
November 21, 2002	TA completed.
November 21, 2002	Forest Service concurs with development mining for the North Lease.
November 21, 2002	CHIA completed
November 26, 2002	AVS check completed with issue recommendation.
November 29, 2002	End of public comment period.
December 2, 2002	Decision Document completed and Permit issued. Sent to OSM.

FINDINGS

Canyon Fuel Company, LLC
North Lease Extension
Skyline Mine
C/007/005
Carbon County, Utah

December 2, 2002

1. The permit application for the extraction of coal from the North Lease at the Skyline Mine is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the approved Utah State Program (the "Act") are in compliance. See Technical Analysis dated November 21, 2002 (R645-300-133.100)

2. The applicant proposes acceptable practices for the reclamation of disturbed lands. The Division has determined that reclamation, as required by the Act can be feasibly accomplished following the approved plan with the attached permit conditions. No new surface disturbance will occur with the North Lease Extension. (R645-300-133.710)

3. An assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been conducted by the Division and no significant impacts were identified. See CHIA dated November 21, 2002. The Mining and Reclamation Plan (MRP) proposed under the revised application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site area (R645-300-133.400 and UCA 40-10-11 (2)(c)).

4. The proposed lands to be included within the permit area are:

    a. Not included within an area designated unsuitable for underground coal mining operation (R645-300-133.220);

    b. not within an area under study for designated land unsuitable for underground coal mining operations (R645-300-133.210);

    c. not on any lands subject to the prohibitions or limitation of 30 CFR 761.11 {a} (national parks, etc), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries);

    d. not within 100 feet of a public road except at the location where the public road accesses the property(R645-300-133.220); and

    e. not within 300 feet of any occupied dwelling (R645-300-133.220).

5. The operation would not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973. A condition is being added to the permit to survey for Mexican Spotted Owl in accordance with the Fish and Wildlife

Service requirements. See Technical Analysis dated November 21, 2002 and letter from U. S. Fish and Wildlife Services dated November 25, 2002 (16 USC 1531 et seq.) (R645-300-133.500).

6. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800). See Technical Analysis November 21, 2002. See e-mail from State Historic Preservation Office, dated November 15, 2002. (R645-300-133.600)

7. The applicant has the legal right to enter and complete mining activities in the permit area through the federal coal lease issued by the Bureau of Land Management. (See Lease Document for Coal Lease UTU-67939, effective September 1, 1996. (R645-300-133.300)

8. A 510 (c) report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; neither Canyon Fuel Company, LLC nor any affiliated company, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with 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 (A 510 (c) report was run on November 26, 2002, see memo to file dated November 26, 2002). (R645-300-133.730)

9. Underground mining operations to be performed under the permit will not be inconsistent with other operations anticipated to be performed in areas adjacent to the proposed permit area.

10. The applicant has posted a surety bond for the Skyline Mine in the amount of $5,076,000 issued by St. Paul Fire and Marine Insurance Company (Surety Number 400SA1919) (R645-300-134).

11. No lands designated as prime farmlands or alluvial valley floors occur on the permit area. See Technical Analysis dated November 21, 2002 (R645-302-313.100 and R645-302-321.100)

12. The proposed postmining land-use of the disturbed area is the same as the pre-mining land use and has been approved by the Division and the surface land management agency, the Forest Service.

13. The Division has made all specific approvals required by the Act, the Cooperative Agreement, and the Federal Lands Program.

14. All procedures for public participation required by the Act, and the approved Utah State Program are in compliance. The public advertisement was published on Ocotober 3, 10, 17, and 24, 2002 in the Sun Advocate and October 8, 15, 22, and 29, 2002 in the Emery County Progress. (R645-300-120)

15. No existing structures will be used in conjunction with this mine. This is an underground extension of an existing mine with no new surface facilities being proposed (R645-300-133.720).

Permit Supervisor

Aaron R. Haddock
Permit Supervisor

Associate Director of Mining

Lowell P Braxton
Director

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FEDERAL **December 2, 2002**

PERMIT
C/007/005

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1594 West North Temple
Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340

This permit, C/007/005, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (DOGM) to:

Canyon Fuel Company, LLC
6955 South Union Park Center, Suite 540
Midvale, Utah 84047
(801) 596-7111

for the Skyline Mine. Canyon Fuel Company, LLC is the lessee of federal, state and fee-owned property. A performance bond is filed with the DOGM in the amount of $5,076,00.00, 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 coal mining and reclamation operations on the following described lands within the permit area at the Skyline Mine situated in the state of Utah, Carbon County, and located:

Township 12 South, Range 6 East, SLBM

Section 26: S1/2SE1/4, SE1/4SW1/4,
Section 34: Lots 1-4, S1/2NE1/4, SE1/4NW1/4, E1/2SW1/4NW1/4,N1/2S1/2;
Section 35: All

Township 13 South, Range 6 East, SLBM

Section 2: All,
Section 3: All,

Section 10: All,
Section 11: All,
Section 12: $SW^1/_4SW^1/_4$, $NW^1/_4SW^1/_4$,
Section 13: $W^1/_2$, portion of $SE^1/_4$ associated with coal conveyance system,
Section 14: All,
Section 15: All,
Section 22: All,
Section 23: All,
Section 24: All area west of Connelville Fault,
Section 25: All area west of Connelville Fault, All area associated with buried power line,
Section 26: All,
Section 27: All,
Section 34: All,
Section 35: All area west of Connelville Fault, and
Section 36: All area west of Connelville Fault, All area associated with buried power line.

Township 13 South, Range 7 East, SLBM

Section 4: Portion of $SW^1/_4$, Portion of $NW^1/_4$ (includes access roads and area associated with a waste rock disposal site)
Section 5: Portion of $NE^1/_4$ (includes access roads and area associated with a waste rock disposal site)
Sections 17 and 18: All or portions of these sections which also includes areas for use as access roads and rail loading facilities. Rights of way and surface easements are also included for construction of a coal conveyance system from the mine portal area down Eccles Canyon to the coal storage and loadout facility at the mouth of its canyon.

Township 14 South, Range 6 East, SLBM

Sections 2 and 3: A parcel of land commencing at the section corners of Sections 33 and 34, Township 13 South, Range 6 East and Sections 3 and 4, Township 14 South, Range 6 East, Salt Lake Base Meridian, thence East along the North boundary of Section 3 for a distance of 3,650 feet, more or less, herein called the point of beginning for this tract; thence South 20° 00' 00" East along the west line of the tract for 5,800 feet, more or less, thence 90° 00' 00" East along the south line of the tract for 1,800 feet, more or less, thence North 21° 00' 00" East along the east line of the tract for 5,800 feet, more or less, thence North 90° 00' 00" West along the north line of the tract for 5,700 feet, more or less, to the point of beginning and containing 459 acres, more or less.
Section 3: Portion of the $NE^1/_4$ associated with a buried water line.

This legal description is for the permit area of the Skyline Mine included in the mining and reclamation plan on file at the Division as shown on Drawing 1.6-3 Skyline Mines Permit Area. The permittee is authorized to conduct coal mining and reclamation operations 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 COMPLIANCE - The permittee will comply with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program.

Sec. 4 PERMIT TERM - This permit becomes effective on December 2, 2002 and expires on April 30, 2007.

Sec. 5 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 R645-303.

Sec. 6 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, R645-400-110, 30 CFR 842.13 and R645-400-220; and,

B. be accompanied by private persons for the purpose of conducting an inspection in accordance with R645-400-100 and 30 CFR 842, when the inspection is in response to an alleged violation reported by the private person.

Sec. 7 SCOPE OF OPERATIONS - The permittee shall conduct coal mining and reclamation operations 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. 8 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. 9 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. 10 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. 11 EXISTING STRUCTURES - As applicable, the permittee will comply with R645-301 and R645-302 for compliance, modification, or abandonment of existing structures.

Sec. 12 RECLAMATION FEE PAYMENT - The permittee shall pay all reclamation fees required by 30 CFR part 870 for coal produced under the permit, for sale, transfer or use.

Sec. 13 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. 14 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. 15 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. 16 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 of necessary actions required. The permittee shall implement the mitigation measures required by DOGM within the time frame specified by DOGM.

Sec. 17 APPEALS - The permittee shall have the right to appeal as provided for under R645-300.

Sec. 18 SPECIAL CONDITIONS - There are special conditions associated with this permitting action attached as Attachment A.

The above conditions (Secs. 1-18) 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: Lowell P Braxton

Date: 12/2/02

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: _____

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ATTACHMENT A
Special Conditions
C/007/005

1) Canyon Fuel Company, LLC must submit water quality data for the Skyline Mine in an electronic format through the Electronic Data Input web site, http://linux1.ogm.utah.gov/cgi-bin/appx-ogm.cgi

2) Canyon Fuel Company, LLC must continue to submit to the Division all studies and data to update the PHC/MRP as a result of the mine inflows. As water studies are finalized, they must be submitted to the Division within 14 days of completion.

3) Canyon Fuel Company, LLC must submit cumulative monthly flow data for discharges into Electric Lake and Eccles Creek. This monthly data must be submitted in the first week of the following month.

4) Canyon Fuel Company, LLC may not commence underground coal mining and reclamation activities in federal coal lease UTU-78562 until approval of the mining plan is authorized by the Secretary of the Interior.

5) Canyon Fuel Company, LLC may "development" mine only in federal coal lease UTU-78562 until full extraction mining is approved by the Division.

State of Utah

Utah Oil Gas and Mining

Coal Regulatory Program

Skyline Mine
North Lease Extension (Winter Quarters)
C/007/005-SR02I-1
Technical Analysis
November 21, 2002

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TECHNICAL ANALYSIS

The Division ensures compliance with the Surface Mining Control and Reclamation Act of 1977(SMCRA). When mines submit a Permit Application Package or an amendment to their Mining and Reclamation Plan, the Division reviews the proposal for conformance to the R645-Coal Mining Rules. This Technical Analysis is such a review. Regardless of these analyses, the Permittee must comply with the minimum regulatory requirements as established by SMCRA.

Readers of this document must be aware that the regulatory requirements are included by reference. A complete and current copy of these regulations and a copy of the Technical Analysis and Findings Review Guide can be found at http://ogm.utah.gov/coal

This Technical Analysis (TA) is written as part of the permit review process. It documents the Findings that the Division has made to date regarding the application for a permit and is the basis for permitting decisions with regard to the application. The TA is broken down into logical section headings that comprise the necessary components of an application. Each section is analyzed and specific findings are then provided which indicate whether or not the application is in compliance with the requirements.

Often the first technical review of an application finds that the application contains some deficiencies. The deficiencies are discussed in the body of the TA and are identified by a regulatory reference that describes the minimum requirements. For the reader's convenience, the deficiencies have been summarized at the beginning of the document. Once all of the deficiencies have been adequately addressed, the TA will be considered final for the permitting action.

It may be that not every topic or regulatory requirement is discussed in this version of the TA. Generally only those sections are analyzed that pertain to the application under review. Previous Division Findings that are not impacted by this application and are not re-visited.

INTRODUCTION

On September 4, 2002 Canyon Fuel Co., LLC submitted a significant permit revision to add 3,291 acres of federal lease #UTU-67939 to its permit area for the Skyline Mine. The Division of Oil, Gas and Mining determined the submittal administratively complete on September 30, 2002. The North Lease Extension will redirect mining northward and extend the life of the Skyline Mine. The Permittee proposes to develop the coal resources north of their current permit area due to extensive flooding in the southern areas.

The North Lease # UTU-67939 is located in the area of Woods, Winter Quarters, and Green canyons southwest of the town of Scofield in Carbon County. The area encompassed by the lease can be found on drawing number 1.6-3 of the application. Lease UTU-67939 was assigned to Coastal States Energy Company in 1996. The Division has titled this application the North Lease. The U.S. Forest Service (USFS) and Bureau of Land Management (BLM) refer to the lease area as the Winter Quarters tract.

There is no additional surface disturbance associated with this lease addition. An environmental assessment was prepared by the U.S. Forest Service in 1995 and a Joint Finding of No Significant Impact / Decision Notice / Rationale was prepared by the BLM and Forest Service on January 23, 1996. Baseline hydrology, wildlife and vegetation information supplied for the North Lease was gathered in 1992 and 1993.

A Joint Bureau of Land Management/Forest Service Finding of No Significant Impact/Decision Notice/Rationale (FONSI) is dated January 23, 1996. The FONSI states that Alternative C as described in the EA best meets the management objectives of the USFS. To meet the objectives, 18 Forest Service Special Stipulations, in addition to the standard lease terms (BLM Lease Form 3400-12) were attached to the Lease in Appendix C.

The Permittee will conduct surveys of perennial streams, riparian plant communities and raptor nests, amphibians, fish, and macro-invertebrates in early summer 2003. Results will be provided to the Division.

The Division recommends approval of development mining on federal lease #UTU-67939. Full extraction, long-wall mining of the lease will require a separate approval from the Division.

GENERAL CONTENTS

IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

Analysis:

The Permittee has updated this section of the Mining and Reclamation Plan. This section was revised on September 4, 2002 with this submittal.

The Permittee has updated maps of surface and mineral ownership, and ownership contiguous to the permit area.

Skyline Mine is one of several coal mines owned by Canyon Fuel Company, LLC. Canyon Fuel Company, LLC is a Limited Liability Company and is 65 percent owned by Arch Western Resources, LLC, and 35 percent by Itochu Coal International Inc. Arch Western Acquisition Corporation owns 99 percent and Delta Housing 1 percent of Arch Western Resources.

Findings:

The Permittee has met the minimum requirements of this section.

VIOLATION INFORMATION

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

Analysis:

The violation information has been updated in this submittal. The information was revised October 2002 in this submittal.

Findings:

The Permittee has met the minimum requirements of this section.

RIGHT OF ENTRY

Regulatory Reference: 30 CFR 778.15; R645-301-114

Analysis:

The information is on Page 1-35 in the Mining and Reclamation Plan. The Permittee has added additional information on Page 1-36 and 1-37 in this submittal. The Bureau of Land Management has assigned UTU-67939 Winter Quarter Lease to Coastal States Energy Company in 1996.

Findings:

The Permittee has met the minimum requirements of this section.

LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

Analysis:

The acreage currently included in state permit area is 7,121 acres. The North Lease contains 3,291 acres (all Federal surface). The addition of the North Lease will bring the permit area to 10,374 (page 1-37 and Drawing No. 1.6-3). Total Federal coal acreage as a result of this revision is 9, 736 acres.

The existing disturbed acreage within permit area is 79.12 acres (page 1-42).

Findings:

The Permittee has met the minimum requirements of this section.

PERMIT TERM

Regulatory References: 30 CFR 778.17; R645-301-116.

Analysis:

Skyline mine began coal production in 1981. There is 1.8 years remaining within the approved mining area. The addition of the North Lease will add five years to the life of mine, for a total of 6.5 years. The permit terms are five years, (MRP, p 1-40).

Findings:

The Permittee has met the minimum requirements of this section.

PUBLIC NOTICE AND COMMENT

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

Analysis:

The Permittee has incorporated a copy of the affidavit of publication from the Sun Advocate and Emery County Progress newspapers into the submittal.

Public notice was given in the two papers during the month of October. The public comment period runs thirty days from the date of last publication; that is until November 29, 2002.

Findings:

The Permittee has met the minimum requirements of this section.

FILING FEE

Regulatory Reference: 30 CFR 777.17; R645-301-118.

Analysis:

Not required for this review.

Findings:

The Permittee has met the minimum requirements of this section.

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

From the amendment submittal submitted in September 2002, numerous completeness deficiencies were cited. Those deficiencies have been answered in the following manner:

- The location of Figure 2.12-A has been identified with a page number in the Land Use section
- The text describing the Burnout Creek study indicates that although a paper has been written, monitoring is still ongoing.
- Plate 7 of Appendix Volume A-1 has been re-submitted.
- Section 2.5 has been revised to clearly and accurately identify the reference materials
- A table of contents for Appendix A of the PHC was submitted as part of the James Canyon submittal on 10/28/02
- Page PHC A-18 has been revised to cite the location of detailed age-dating studies
- Section 2.3.7 text, tables, and drawing 2.3.6-1 have all been modified to include the North Lease and updated to insure all are consistent
- A new copy of the current UPDES permit has been provided
- Culinary wells W13-1 and W17-1 have been provided on drawing 2.3.6-1

The Permittee has submitted a map and plans having the necessary format and content requirements.

Findings:

The Permittee has met the minimum requirements of this section.

REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

Maps are P.E. certified. Consulting firms have been identified in Section 2.1.

Findings:

The Permittee has met the minimum requirements of this section.

MAPS AND PLANS

Regulatory Reference: 30 CFR 777.14; R645-301-140.

Analysis:

The Permittee submitted maps that are larger than 1:24,000. This meets the requirements.

Findings:

The Permittee has met the minimum requirements of this section.

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

Analysis:

The Division determined that the Significant Revision was administratively complete on September 30, 2002.

Findings:

The Permittee has met the minimum requirements of this section.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The North Lease is in a montane area of elevation 8300 –9300 feet. Slopes are well vegetated with aspen and conifers. Two main drainages (Winter Quarters and Woods Canyon) flow northeast emptying into Mud Creek (or Pleasant Valley Creek). Each drainage has several reaches contributing flow. Winter Quarters Creek has a wide floodplain vegetated with grasses.

The seam of interest in the North Lease is the Lower O'Conner "A" seam in the Blackhawk Formation, which in the North Lease lies in a zone of compression. The compression appears to limit the ground water inflow to the mine.

Findings:

The information provided is adequate.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Analysis:

The permit area is listed as 10,374 acres(p 1-36 and 1-37 and Drawing No. 1.6-3)

Findings:

The information provided in the PAP meets the minimum requirements of the regulations for the Permit section of the regulations.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

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

Analysis:

U.S. Forest Service Lease Stipulation #1 requires that a cultural resource inventory and a paleontological appraisal of the areas to be disturbed.

Section 2.1.1 of the application discusses the Cultural, Historical, and Archeological resources. This section refers to the 1995 Environmental Assessment (EA) Appendix B (Criterion Number 7) which states that there are no properties included in the National Register of Historic Places on or near the proposed lease tract. Section 2.1.1 also refers to Page 10 section H of the EA which states that "Leasing of the tract should not result in significant impacts to cultural or paleontological resources." A copy of the EA is provided for in Appendix A-2 of the application. Section 2.1.1 page 2-4b refers to the AERC, (Archeological Environmental Research Corporation), reports.

Section 2.1.1 page 2-4b of the application refers to a 1996 Archaeological-Environmental Research Corporation (AERC) Report entitled "Cultural Resource Evaluation of Proposed Drillholes & Associated Access Routes in the Upper Winter Quarters Canyon and Winter Quarters Ridge Locality of Carbon County, Utah." The report states that "No previously recorded significant or National Register eligible cultural resources will be adversely effected by the proposed developments. No isolated artifacts were observed during the evaluation. No paleontological loci were identified during the evaluation. No newly identified cultural resource activity loci were discovered during the examination." This document is provided for in Appendix A-2 of the application.

As required by regulation the Division has notified the State Historic Preservation Officer (SHPO) of Canyon Fuel's application to mine in the identified lease area and requested their concurrence with the EA and current findings. In a conversation with Jim Dykman from the SHPO, on November 12, 2002 Mr. Dykman indicated that concurrence was granted when the request lapsed for 30 days, on or about November 10, 2002. A copy of the "E" mail from Mr. Dykman confirming No Historic Properties Affected is included in the file.

Findings:

The information in the Mining and Reclamation Plan, MRP, Environmental Assessment, EA, application and concurrence from SHPO is adequate to meet the requirements of this section of the regulations.

CLIMATOLOGICAL RESOURCE INFORMATION

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

Analysis:

Climatological information for the mine site is outlined in Section 2.6 of the approved MRP. The North Lease permit area is immediately adjacent to the north boundary of the existing permit area. The climate for the North Lease is the same as the existing permit area. No new addition has been provided.

Findings:

The information in the Mining and Reclamation Plan is adequate for the purposes of the Regulations.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.19; R645-301-320.

Analysis:

The following Forest Service Stipulations attached to the Lease require vegetation baseline information: Lease Stipulation #2 (T & E species), Stipulation #3 (baseline data), Stipulation # 7 (monitoring of effects), Stipulation #9 ("Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: ….(3) damage or alter the flow of perennial streams."

Baseline vegetation is discussed in Section 2.7 of the MRP and in Appendix A2. In Section 2.7.1, the application summarizes the vegetation communities for the North Lease as outlined in the Environmental Assessment (1995). The application indicates that the ridgetops are mountain grassland communities (where mountain brome *Bromus carinatus* and slender wheatgrass *Elymus trachycaulus* are dominant) and sagebrush-grass (where Vasey sagebrush *Artemesia tridentate* var. *vaseyana*; rabbitbrush *Chrysothamnus viscidiflorus*; Louisiana sagewort *Artemesia ludioviciana* are also dominant.)

Section 2.7.6 adds that the Aspen community is the most common vegetation type of the Winter Quarters tract area (North Lease). Along with snowberry *Symphoricarpos oreophilus* or Oregon grape (*Mahonia repens*) are the dominant understory. Also important by relative acreage

are the communities of Engelman spruce *Picea engelmanii* and subalpine fir *Abies lasiocarpa* with an understory of gooseberry currant *Ribes montigenum*.

Vegetation types are illustrated on Drawing No. 2.7.1-1a. Section 2.7.6 page 2.63e of the application indicates that although no quantitative information was gathered and no ground-truthing techniques have yet been employed in gathering baseline information, ground-truthing will be conducted in the early Summer of 2003 along the perennial streams within the North Lease. This commitment indicates on page 2-63e that the survey will include productivity measurements, plant community descriptions and mapping of the riparian areas along perennial streams in the North Lease. Total acreage of each vegetation type for the North Lease area will be provided after ground-truthing.

Section 2.7.1 indicates:

- There are a few, productive, small meadows dominated by bluegrass with some sedges and carex.
- Riparian areas exist along streams and at seeps and springs.
- The vegetation along the waters edge consists of species of carex, bluegrass, and to a lesser extent sedges.
- Some willow is present along the streams.

Exhibit 2.7.5 of Appendix A2 contains a May 1992 report by Mount Nebo Scientifc Research & Consulting (Springville, Utah) summarizing existing Forest Service vegetation information. The report concludes that "riparian and wetland vegetation was not specifically mapped" by the USFS and "these areas should be mapped if the lease area is pursued…"

The USFS is progressing towards electronic mapping of the Manti LaSal National Forest. In 2002, the Division previewed the electronic mapping information available in draft form and found that riparian and wetland designations have yet to be added.

Section 2.1.2 indicates that there have been no threatened or endangered (T & E) species identified on the project or adjacent areas. Section 2.7.6 indicates that there will be no surface impacts within the permit area and therefore no impacts to threatened, endangered, endemic or sensitive species.

The Intermountain Proposed Endangered, Threatened, and Sensitive Species List, last updated in January 1999, indicates that the following endangered species may inhabit the Manti La Sal:

- Clay phacelia *Phacelia argillacea*

The following threatened species may also inhabit the Manti La Sal:

- Heliotrope milkvetch *Astragalus montii*
- Ute ladies' tresses *Spiranthes diluvialis*
- Winkler cactus *Pediocactus winkleri*

Several more sensitive species are listed for the Manti La Sal:

- Chatterley Onion *Allium geyeri chatterleyi*
- Sweet-flowered rock jasmine *Andorsace chamaejasme carinata*
- Link Trail columbine *Aquilegia flavescens rubicunda*
- Bicknell Milkvetch *Astragalus consobrinus*
- Creutzfeldt-flower cryptanth *Cryptantha creutzfeldtii*
- Pinnate spring-parsley *Cymopterus beckii*
- Abajo daisy *Erigeron abajoensis*
- Carrington daisy *Erigeron carringtonae*
- Kachina daisy *Erigeron kachinensis*
- LaSal daisy *Erigeron mancus*
- Canyonlands lomatium *Lomatium latilobum*
- Canyon sweetvetch *Hedysarum occidentale var. canone*
- Arizona willow *Salix arizonica*
- Musinea groundsel *Senecio musiniensis*
- Maguire campion *Silene petersonii*

In researching the potential occurrence of each of these species in more detail, the Permittee approached Bob Thompson, U.S.F.S. Manti La Sal District Botanist who stated "none of the currently listed Threatened and Endangered species or sensitive species are found in the Winter Quarters Lease Area" (page 2-63f).

Findings:

The information provided meets the minimum requirements of Environmental Resource Vegetation for development mining and the application contains a commitment to survey the riparian areas for baseline information in the early summer of 2003. The Division will require ground truthing, description, map and productivity information for riparian and wetland areas along the perennial reaches of all stream channels within the permit area before longwall mining may occur.

FISH AND WILDLIFE RESOURCE INFORMATION

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

Analysis:

The Fish and Wildlife Information is provided for in Sections 2.8 through 2.10 of the application, and volume 1A of the approved Mining and Reclamation Plan (MRP). Sec. 2.1.2, and 2.7.6, and 2.10.2 discuss Threatened & Endangered (T & E) species. Sections 2.8, 2.9 and 2.9-5 discuss aquatic and terrestrial wildlife information. Sections 2.10 and 2.10.2 discuss raptors. Avocet Consulting Inc. has been included in section 2.1 of the application as the firm that conducted the Ground Surveys for Nesting Raptors.

Drawing 1.6-3 has been revised to include the proposed addition to the permit area. This map shows the addition of the lease boundary. The proposed addition to the permit area includes critical value summer deer and elk and high value winter moose habitats. The applicant has committed to conduct raptor, macroinvertebrate and fish surveys during early summer 2003, prior to any subsidence occurring in 2004. On October 24, 2002 a meeting was held to discus wildlife resource information required for the new lease. Specifically discussed were raptor monitoring, three- toed woodpecker monitoring and a survey protocol for macroinvertebrate and fish sampling. Agencies represented were The USFS, USFWS, DWR and the Division. The representatives from the Forest Service indicated they did not need additional monitoring for raptors and the three-toed woodpecker for the proposed North Lease addition. An "E"- mail letter from the Forest Service was provided to the Division on November 14, 2002. This letter stated their position and is included in the file. Additional comments regarding sensitive species included the Goshawk was not likely to be affected by subsidence, there would be no impacts to the three toed wood pecker, the wolverine had not been seen in Utah for many years, boreal toad habitat may be present but would be evaluated during the mollusk and amphibian survey, there were no bats in the proposed lease area, and Sage Grouse were noted in adjacent areas. Copies of the macroinvertebrate sampling protocol were provided to the Division and applicant. In section 2.8 page 2-71a of the application the applicant has committed to implement the survey protocol to be determined by the Division, USFS, Division of Wildlife Resources and the USFWS.

The Division has asked the Permittee for information on the perennial nature of the streams and the reaches of the streams in the Environmental Resources Hydrologic Resource Information section of this TA. During a field visit to the proposed lease area on September 27, 2002 it was noted that water was flowing in Winter Quarters Creek, three unnamed tributaries and Bob's and Box Canyons. There is an established riparian corridor along the main stream channel. An unnamed side canyon to the south (approximately 1 mile from the F.S. boundary) was flowing, but had been dammed by beaver activity. Fish were also observed in the lower reaches of the main stream near the east permit boundary.

The entire North Lease area is considered critical value elk summer use area and a high value deer summer use area on the Utah Natural Heritage Program database (e-mail communication from Anne Axel Information Manager, Utah Natural Heritage Program,Utah

Division of Wildlife Resources, 10/21/02). The database showed no records of occurance of threatened, endanagered, or sensitive plant or animal species in the proposed addition. No raptor nests were shown on this database or the DWR database.

Findings:

The information contained in this section of the application is adequate to meet the requirements of these sections of the regulations. The Division will require that macroinvertebrate survey protocol be established and a macro invertebrate survey be conducted for two years prior to longwall mining and two years after mining in the area.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

Drawing. No. 2.7.1-1b Permit Area Order III Soil Survey Map covers the additional permit area. No additional surface disturbance is planned.

Findings:

The information provided is adequate for the purposes of the regulations.

LAND-USE RESOURCE INFORMATION

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

Analysis:

Land Use is discussed in Section 2.12 of the Application. The existing land use for the North Lease area is wildlife habitat, grazing, recreation, forestry and mining. Previously mined areas are shown on Drawing 2.2.7-7. Land Use for the area is shown on Drawing No. 2.12.1-1.

Findings:

The information provided is adequate for the purposes of the Regulations.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Analysis:

Alluvial Valley Floor Determination

There is no alluvial valley within the permit area. The The CHIA evaluation has determined that there are quaternary deposits at the mouth of Wood Canyon and Winter Quarters Canyon which is downstream of and outside of the permit area.

Findings:

The Division finds that there is no alluvial valley floor within the permit area. The Division will require an analysis of the potential affects of subsidence on the alluvial valley floor downstream of ther permit area in Woods Canyon and Winter Quarters Canyon prior to longwall mining.

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

Analysis:

Section 2.14 and Appendix Volume A-2 has a prime farmland determination letter for the area. There is no historical use of cropland within the proposed permit area. There is no planned surface disturbance within the additional permit area.

Findings:

The Division concurs with the Natural Resource Conservation Service that there is no prime farmland within the permit area.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

Clarity has been added to Section 2.2, the structural geology information by extending the Connellville Fault through the drawing 2.2.1-1 to match the text. And drawing 2.2.7-7 has been referenced in the text to identify Mines #1, #2, and #3.

Acid and Toxic analysis results for the North Lease area were not yet available as of the November 4, 2002 submittal. However, the seam to be mined is a continuation of Mine #3 where significant testing has been conducted. The seam of interest in the North Lease is the Lower O'Conner "A" seam. Drill logs for holes 91-26-1 and 91-35-1 were received with this application and placed in the Confidential Folder for the mine.

The Mine has committed to submitting new information when it becomes available, and the material placed at the waste disposal site is compositely sampled at a minimum of one (1) sample per 2000 tons hauled.

Findings:

The information provided adequately addresses the minimum requirements of the Environmental Resource Information – Geologic Resource Information section of the regulations.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Generally, the Applicant has done a good job of providing the necessary information for approval of the proposed amendment. Due to the complexity of the hydrology involved many outside studies (contained in the appendices and addendum) were conducted. With the current modifications made to the amendment, the applicant has spent significant time both updating the MRP and referencing the relevant appendices/studies that outline, in detail, the newest and most pertinent information.

Sampling and Analysis

The sampling and analysis that has been provided on springs, streams, and wells for initial characterization of the hydrologic regime in the North Lease area is adequate to initiate

development mining. Additional Spring, Summer, and Fall sampling and analysis will be required prior to longwall mining commencing in areas undermining perennial streams. A review of the submitted information has been conducted by Division personnel and considered adequate.

Baseline Information

In Section 2.3 of the MRP, the text clearly illustrates that the specific yields, and hydraulic conductivities of the rock strata surrounding the Mine are typically very low (yields of 0.2 to 0.7 percent). However, it also states that conditions encountered in the southern portion of the mine in August 2001 clearly changed this. A detailed analysis of these conditions are discussed in the 'July 2002 Addendum to the PHC'. The brief discussion provided, and the reference to the PHC adequately addresses previous Division concerns.

Section 2.3.1 – Geologic Setting of the Ground Water System, text has been modified to indicate the Upper Joes Valley fault zone does not exist in the permit area, which is supported by mine data. Section 2.3.1 has also been updated to include a discussion of significant water encountered in the 10Left area of the Mine (drawing PHC A-2) that is fault related. A detailed discussion of the specifics of two wells (JC-1 and JC-2) drilled to dewater the area is referred to the July 2002 Addendum to the PHC. This section adequately describes the both the general/common geologic setting of the groundwater system, and briefly describes the unique situation encountered in the southern portion of the mine since 1999. A brief discussion of production wells JC-1 and JC-2 is provided and complete discussion is referenced in the July 2002 Addendum to the PHC. This adequately addresses previous Division concerns in this section of the MRP.

Section 2.3.4 – Aquifer Characteristics has been updated to include a discussion of current conditions encountered in Mine #2. Drawings 2.3.4-1 and 2.3.4-2 have been updated and modified to illustrate the conditions encountered since 1999. For other updated water level data and a detailed discussion, the reader is referred to July 2002 Addendum to the PHC. The information provided adequately addresses the aquifer characteristics.

Section 2.3.5.2 – Groundwater Rights, clearly references the location of the water rights status as of July 2002. They are listed in Volume 4, 1st and 2nd binders, and presented on Plate 2.3.5.2-1. For the North Lease area, a discussion has been provided outlining the addition of seven (7) springs and one (1) stockwatering pond to the list of water rights. No additional information is necessary at this time.

Baseline Cumulative Impact Area Information

In Section 2.5.3 – Alternative Water Supply, the Applicant has identified they currently own approximately 556 acre-feet of water rights in the Scofield Reservoir. In Section 2.5.3 the

Applicant also commits to "correct any material damage resulting from subsidence caused to surface lands (which includes water rights), to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses that it was capable of supporting before subsidence damage". Additional commitments include, "Restoration of water flows to impacted sources will be accomplished using the Best Technology Currently Available (BTCA)". As a final alternative, the mine will "explore the transferring of water rights to the injured party in flow equal to the determined loss and /or monetary reimbursement for proven material damages". The statements made in this section adequately identify alternative water supplies and the methodology that will be implemented for water replacement should any damage occur. This information adequately addresses earlier Division concerns.

Modeling

In Section 2.5.2 – Mining Impact on Water Quantity, the Permittee provides a brief discussion of modeling that has been initiated to better understand the hydrologic system and the water within the Star Point Sandstone. "The model will endeavor to delineate the possible areal extent of the aquifer, the volume of water contained in the aquifer, and the potential sources and discharge locations of the aquifer". However, due to the geology of the North Lease area, problems associated with encountering significant water is not anticipated. The model should be complete by the end of 2002. The Permittee commits to incorporate a report discussing the results into the PHC at that time.

Probable Hydrologic Consequences Determination

Section 2.5 - Hydrologic Impacts of Mining Activities, is the section of the MRP that essentially summarizes the Permittee's Probable Hydrologic Consequences Determination. Sub-sections include 2.5.1 – Potentially Affected Water Rights, 2.5.2 – Mining Impact on Water Quantity, and 2.5.3 – Alternative Water Supply, respectively. Prior to section 2.5.1, two introductory paragraphs list the relevant appendices used for the Permittee's PHC determination. This adequately addresses a previous Division concern to outline what additional appendices were used in the Permittees PHC determination.

Due to the complex nature of the hydrogeologic mining conditions encountered in the southern portion of the permit area since 1999, numerous detailed studies have been conducted and are summarized in the relevant subsections. The details backing the conclusions stated in this section and supplemental discussions can be found in the PHC evaluations. All pertinent studies, evaluations, and reports are listed in the front of this section and are referenced in the text. Primarily, mining conditions encountered in the southern portion of the Mine has instigated this submittal of mining in the North Lease area. The hydrogeologic conditions anticipated in the North Lease area is a continuation of conditions observed in Mine #3 and outlined in Sections 2.2, 2.3, and 2.4 of the MRP. No adverse impacts to the hydrologic regime are

anticipated from advanced mining into the North Lease area. Although Mine #3 lies directly on top of the Storrs Sandstone, only minor inflows have been observed; a stark contrast from conditions observed in the southern portion of the permit area.

The Permittee was asked to provide a more detailed discussion of an alternative water supply for the Huntington drainage. In Section 2.5.1 – Potentially Affected Water Rights, the Permittee provides a discussion of the water being encountered beneath the Huntington drainage, and how data and analysis indicate there is no significant connection between the surface waters and waters encountered in the mine.

Studies indicate the Star Point Sandstone does not transmit water easily, does not have a significant discharge point located immediately down gradient of the mine, and age-dating of the water suggests it takes thousands of years to move through the aquifer despite the high transmissivity of the fractures within the sandstone. The majority of inflow enters the mine through the floor along north-south trending fault and fracture zones within the Star Point Formation. The water is stored in the Star Point Sandstone under considerable potentiometric head, which indicates it is a confined aquifer. Being under considerable head also suggests the recharge area is not in the immediate vicinity (Star Point Sandstone mapped to the east of the permit area). Also, data from upgradient wells is limited; the two wells owned by Canyon Fuel Co., located in Eccles Canyon are pumped for mine use. In addition, all the water rights in the Huntington drainage are within the Blackhawk Formation, which is hydraulically disconnected from the Star Point Sandstone by impermeable siltstones and shales. All of which indicates although the water encountered in the mine is located beneath the Huntington drainage, water rights located within the Huntington drainage are not being affected. The Mine analysis of the water quality (both of surface and in-mine flows), mine geology, drilling, and groundwater well data indicate the large inflows to the mine originate from deep within the Star Point Sandstone and are transported to the mine through faults and fractured sandstone from well below the mine. Skyline continues to monitor spring and stream flows in the Winter Quarters, Eccles, Mud Creek and Huntington drainages to identify impacts. The information provided adequately addresses the Division concern of inter-basin water transfer. Should conditions change, adequate monitoring of the inflows into the mine, and surface monitoring of springs and streams will document any mitigation that should take place.

In Section 2.5.2 – Mining Impacts on Water Quantity, the Permittee has provided a discussion on the studies conducted in Burnout Canyon which suggest no significant interruption or change in flow are anticipated in the perennial streams located in the North Lease caused by undermining and related subsidence. When subsidence does occur, the subsidence cracks tend to seal rapidly, preventing the deep percolation and subsequent loss of water. This is due to the impermeable nature of the Blackhawk Formation with its inter-bedded, fine-grained sandstones, siltstones and shales. Skyline mine intents to petition the Forest Service to allow the undermining of Winter Quarters Canyon based on the positive results of the Burnout Canyon study. Additional variables that reduce the possibility of adverse impacts caused by subsidence

is the thickness of overburden over the majority of the area, and that only the Lower O'Connor A seam is the only coal unit to be mined.

Mining impacts on Water Quantity caused by increased discharge to Eccles Creek from mining in the North Lease are not anticipated. Many distinct differences in geology from the southern portion of the permit area are outlined in Section 2.2 of the MRP, a major factor being the in-situ stress of the rocks in the North Lease area have been tested and determined to be in compression in an east-west direction. Similar measurements taken in Mine #2 indicate the rocks are in extension in an east-west direction. Also, previous mining in the area (Mine #3) had no problems with water coming out of the Storrs Sandstone, the apparent source of in-flows in the southern portion of the mine.

To address the effects on water quantity discharged into Eccles Creek / Mud Creek a study was initiated in November 2001 and a work plan was revised in July 2002. The objective of the study is to characterize the physical characteristics of the stream channels, through both bank stability and vegetation, and through ongoing monitoring determine whether undesirable impacts are occurring along the stream due to excessive discharge from the mine. This is outlined briefly in Section 2.3.7 – Groundwater Monitoring Program of the MRP (pg. 2-35a) and in detail in Volume 2.12 – Land Use (Attachment 3) of the MRP. Should any adverse impacts occur related to discharge, the monitoring program, as outlined should be able to identify and quantify any damages.

The Permittee has expanded comments on the 'positive effect on the aquatic flow system' the increased discharge has had on Eccles and Mud Creeks by including the following statement. "The increased flows to Scofield Reservoir most likely benefited the fish population in the lake by maintaining a sufficient level of dissolved oxygen to avoid a general fish kill that frequently occurs in the lake during periods of drought, such as has been occurring in the area since 2000." Although not completely substantiated, this statement is intuitively correct since the large volumes of water being discharged have TDS concentrations only slightly higher than background levels.

Within the July 2002 Addendum to the PHC, the following modifications were made in response to Division concerns cited in the October 25, 2002, technical analysis.

- A table of contents has been included at the beginning of the July 2002 Addendum to the PHC, and tabs have been added to segregate the various sections.
- Pages PHC A-11 through A-13 provide a brief discussion indicating the springs, seeps, and streams monitored within the Huntington drainage basin indicate the shallow ground water aquifers are controlled by the fluctuations in yearly precipitation or drought cycles, as supported by the graphs available in Appendix A.

In conjunction with the increased in-mine flow, age-dating analysis, of the encountered waters has been conducted by the Permittee. This has proven to be a critical analysis in the characterization of the water. Sampling has been infrequent for certain locations due to the

inability to collect the samples caused by safety concerns. However, multiple analyses that have been conducted include: water chemistry; temperature; stable isotope (Deuterium, Oxygen 18); and unstable isotope (Tritium and Carbon 14). All of which consistently indicate that the surface waters of the Huntington basin are significantly different and consistently younger than the waters encountered as inflow into the mine. In addition, at sites where feasible, analyses are being conducted on a regular frequency. A summary discussion of this information is provided in the July 2002 Addendum to the PHC on pages PHC A-14 through PHC A-17, and the complete discussion is found in Appendix A (Petersen Report) and Appendix C (HCI report) of the July 2002 Addendum to the PHC. This information adequately addresses earlier mentioned Division concerns.

Pages PHC A-13 and PHC A-14 discuss the basic geomorphology of Eccles and Mud Creeks and the ongoing bank stability/vegetation study. A primary function of the study/monitoring is to assess whether the increased flow (44 times the normal daily flow) is having any long-term, adverse impacts to the streams.

A more in-depth discussion of the bank stability/vegetation study has been provided in Section 2.4.2 – Surface Water Hydrology, Flow Characteristics, and Section 2.12 – Land Use of the MRP. It is also described in detail in Appendix D of the July 2002 Addendum to the PHC and Attachment #3 of Section 2.12. This adequately addresses earlier noted Division concerns.

The October 2002 Addendum to the PHC – Appendix G is an 'Internal Correspondence' that clearly provides a recent history (March 1999 – March 2002) outlining the significant mine in-flows, their respective location, elevations, and present in-flows and pressures. It goes on to describe the timing of when mining will be completed in the southern portion of the mine and the schedule and location for sealing certain portions of the mine. Once the southern portions of the mine are no longer mined, those sections will be allowed to flood. The flooding of mine workings will allow a pressure-head to build up against the current inflows. The pressure-head will continue to build against the inflows by filling the mine workings, up-gradient to the elevation of the 'West Mains'; a maximum elevation of approximately 8290 feet. Calculations estimate the current inflows of approximately 9200 gpm will be reduced to anywhere from approximately 2900 gpm to possibly no discharge into Eccles Creek by December 2004. This rate of discharge is based on no pumping conducted from Well JC-1, which would further reduce discharge to Eccles Creek. This information, combined with the minimal inflows anticipated from the North Lease area, suggests that any potential impacts to Eccles Creek and Mud Creek will be short-lived. This information adequately addresses earlier Division concerns of how the currently high discharges will be handled in the future.

Groundwater Monitoring Plan

Section 2.3.6 – Groundwater Quality, discusses several well that were developed and completed in the Star Point Sandstone sandstone. Table PHC A-2 Well Data Summary Table

provided in this submittal outlines: the wells in the groundwater monitoring plan; the formation in which the wells are screened; the screen elevation; and the historic water level within the well. This table provides valuable information in understanding the groundwater. A brief discussion of Well W2-1 (98-2-1) has been provided which briefly outlines current conditions within the southern portion of the permit area. Since the well is located along a major fault and fracture zone, the water level within the well has been drawn down through pumping 197-ft.(as of August 2, 2002) from historic levels. This same response however, is not seen in groundwater wells not directly connected with a fault system. For a complete discussion of the groundwater potentiometric surface, the reader is referred to the July 2002 Addendum to the PHC.

Surface-Water Monitoring Plan

The Permittee has adequately identified additional surface water monitoring sites to include the North Lease area. The Permittee has indicated they will look into possibly moving CS-19 or adding an additional surface-monitoring site on Woods Canyon that is located closer to the proposed mine permit area. Following discussions with the Division, the Permittee has added surface-water monitoring site CS-21 to Woods Canyon. Although CS-19, located on Woods Canyon Creek, already monitors the area it is located approximately 2.5 miles downstream of the permit boundary. CS-21 is located immediately downstream of the permit boundary and will better service the permit area. This adequately addresses a concern previously cited by the Division.

Findings:

The information provided adequately addresses the minimum requirements of the Environmental Resource Information – Hydrologic Resource Information section of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

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

Analysis:

Affected Area Boundary Maps

The Division usually considers the affected area to be the same as the permit area. The affected area may include areas that the Permittee has not yet acquired or permitted but plans to

do so in the future. Drawing No. 1.6-3, Skyline Mines Permit Area, shows the location of the permit boundaries.

Archeological Site Maps

The 1996 archaeological information is provided for in Appendix A-2 of the application. The archaeological site map is provided for in Appendix Volume A-3 of the approved MRP.

The SR proposal extends the underground mining operations. There is no change to the approved MRP.

Coal Resource and Geologic Information Maps

Plate 2.2.1-1 – Surface Geology has been updated to include the North Lease area. It has also been expanded to include the O'Connor fault and an extension of the Connelville fault through the former Winter Quarters Mine area. In addition, drawing 2.1.1-2 – General Geologic Map of Permit Area, has been submitted for a further understanding of the regional surface geology. Drawing 2.1.1-2 expands geologic coverage east-west to include the Pleasant Valley fault and the Gooseberry fault; and north-south to include the Fish Creek graben area and the Electric Lake dam. The Star Point formation has also been mapped to help identify the anticipated discharge/recharge areas of the water being encountered in the southern portion of the current permit area. Quaternary-aged sediments have also been included in the lower reaches of the streams to help in the Alluvial Valley Floor (AVF) determination. On a regional scale when looking at fault alignments, the orientation in the southern portion of the permit area is south-southwest to north-northeast, while the orientation of the faults in the northern portion of the permit area is generally west-northwest to east-southeast. The central portion of the permit area is also truncated by a series of igneous intrusions (dikes). The geologic maps support the mine information indicating different geologic conditions exist.

In addition, Drawings 2.3.4-1A through –1C have been provided to give a graphic representation of the geology in cross-section. Drawing 2.3.4-1A provides a north-south cross section through the approximate center of the permit area; 2.3.4-1B runs east-west through the southern portion of the North Lease area; and 2.3.4-1C runs east-west through the southern portion of the current permit area, respectively. These drawings help illustrate the doming effect in the approximate middle of the property, the southwest to northwest dipping of the beds, and the thinning and pinching out of coal beds to the north. The additional information adequately addresses the Division's needs to identify the geology of the surrounding area.

Cultural Resource Maps

None.

Existing Structures and Facilities Maps

The Division usually considers the affected area to be the same the permit area. The affected area may include areas that the Permittee has not yet acquired or permitted but plans to do so in the future. Drawing No. 1.6-3, Skyline Mines Permit Area, shows the location of the permit boundaries.

Existing Surface Configuration Maps

Drawing No. 1.6-3, Skyline Mines Permit Area, shows the existing surface configurations. The map has topographic lines that appear to come from a USGS topographic map. Because there are no scheduled surface facilities in North Lease Extension, the Division will not require the Permittee to provide a more detailed map.

Mine Workings Maps

The Mine Workings Map has been updated to included proposed monitoring in the North Lease area. Modifications to the mining methods have been taken into account in areas surrounding perennial streams.

Drawing No. 2.2.7-7 shows the location of abandoned mine workings in and around the permit area. The horizontal distance between the proposed workings and the abandoned mine is 50 feet.

Monitoring and Sampling Location Maps

Plate 2.3.6-1 has been updated to include proposed additional monitoring of surface and groundwater sites based on the addition of the North Lease area. In addition, as part of the Subsidence Monitoring Plan, a total of seven (7) flow-monitoring sites have been assigned to monitor flow changes in areas possibly affected by subsidence. These sites are outlined on Drawing 2.3.6-2 – North Lease Subsidence Hydrologic Monitoring Points.

Permit Area Boundary Maps

Drawing No. 1.6-3, Skyline Mines Permit Area, shows the proposed permit area. The map is at a scale of 1 to 24,000.

Subsurface Water Resource Maps

In Section 2.3.4, the water levels of the two monitoring wells in the North Lease area are discussed. Drawing 2.3.4-2 has been updated to include the potentiometric surface based on information provided by the two (2) existing monitoring wells in the North Lease area. The drawing helps illustrate the lack on connectivity of groundwater between the North Lease area and the southern portion of the existing mine. It should be noted however, that the potentiometric surface in the North Lease area is 'inferred', based solely on information from only two (2) wells. Due to the historically 'discontinuous' nature of the groundwater, it is possible that a continuous potentiometeric surface may not exist between these two wells.

Surface and Subsurface Manmade Features Maps

Plates 2.3.5.1-1 and 2.3.5.2-1 have been updated to include the North Lease area. No additional updates are necessary.

Surface and Subsurface Ownership Maps

None.

Surface Water Resource Maps

Plate 2.3.6-1 apparently identifies the sections of the streams that are perennial and intermittent (solid and dashed lines, respectively. Winter Quarters and Woods Canyon were field verified to identify perennial reaches and beaver ponds impounding in excess of 0.25 acre-foot of water. Additional surveys, yet to be determined by the USFS, will be conducted in 2003 and added to the MRP. This information adequately addresses earlier Division concerns.

Vegetation Reference Area Maps

No surface disturbance is planned within the North Lease. No reference area is required.

Wildlife Maps

Wildlife maps are provided for in Appendix A-2 of the North Lease application and volume A-2 of the MRP. The applicant has committed to conduct a current raptor survey in the early summer 2003, prior to longwall mining.

Findings:

The information provided meets the minimum requirements of the Environmental Resource Information – Maps, Plans, and Cross Sections of Resource Information section of the regulations.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Analysis:

The Permittee proposes to extend mining to the North Lease Extension. The area to be mined is shown on several maps including Drawing No. 3.3-2. All mining except for development work will be done using longwall methods.

No surface facilities will be constructed in association with the North Lease Extension. There will be no additional support facilities or utility installations as part of the North Lease Extension.

No new mine openings are scheduled for the North Lease Extension.

There will be no change to the existing Air Quality permit.

There will be no anticipated surface disturbance and no soils handling operations.

There are no existing structures in the North Lease area.

The North Lease Extension will not require the Permittee to use any additional public roads or to relocate existing public roads.

The North Lease Extension will not require the Permittee to use any additional public roads or to relocate existing public roads.

No new roads or other surface transportation facilities will be constructed in association with the North Lease Extension.

No surface blasting will be associated with the North Lease Extension.

Findings:

The information provided in the PAP meets the minimum requirements of the regulations for the Mining Operations and Facilities section of the regulations.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR784.17; R645-301-411.

Page 10 section H of the Environmental Assessment for the lease area states that "Leasing of the tract should not result in significant impacts to cultural or paleontological resources." According to Appendix B of the EA there are no public roads, cemeteries, public buildings, or occupied dwellings within the proposed lease area. Supporting documents for these statements are provided in Appendix A-2 of the application.

Findings:

The applicant has provided the 1996 archaeological information in Appendix A-2 of the application. The Mining and Reclamation Plan, MRP, Environmental Assessment, EA, and supportive archeological information are adequate to meet the requirements of this section of the regulations.

COAL RECOVERY

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

Analysis:

Eight million tons of Federal coal currently lie within the approved mining plan area. Addition of the North Lease will bring another twelve million tons of Federal coal into the mine permit area. Maximum production is five million tons/yr. Production has averaged four million tons/yr.

The Permittee plans to mine only the Lower O'Connor "A" seam in the North Lease Extension area. The general requirements for economic coal according to the Permittee are:

- Coal thickness is greater than 5 feet.
- Interburden thickness is greater than 40 feet.

However, due to equipment limitations the Permittee will only be able to mine coal with a minimum thickness of 7.5 feet.

The Permittee plans to conduct all mining (excluding development work) with longwall equipment. Some areas in the North Lease Extension are not suitable for longwall mining and will not be mined.

The only part of the North Lease Extension that the Permittee plans to mine in the next five years is the southeast section. The area to the west has low coal from parting and therefore cannot be mined with the available equipment. A dike and two major faults block access to the north. The Permittee plans to drill four to six exploration holes in 2003 to determine if mining conditions to the north are feasible.

The Division reviewed the November 2002 draft version of the Resource Recovery Protection Plan (R2P2). The Bureau of Land Management's review and decision on the R2P2 is still pending.

Findings:

Information provided in the plan is adequate to meet the minimum requirements of the regulations.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Renewable Resources Survey

- The information from the pre-subsidence survey is shown on Drawing Number 4.17-1A, North Lease Pre-subsidence Survey Map. The map scale is 1:12,000 and includes the location of State-appropriated water rights. The water rights are identified by their State I.D. number, and type such as ground water, surface water and surface water diversion.
- The Permittee did not show any structures such as public buildings, churches, schools, hospitals and impoundments with a storage capacity of more than 20-acre feet of water in the subsidence zone. The Permittee conducted a survey of the area and found no structures.
- The subsidence zone is show on Drawing Number 4.17-1A, North Lease Pre-subsidence Survey Map. In addition to the subsidence zone, the Permittee also showed the projected areas where surface subsidence features could occur.
- The subsidence zone is based on the assumption of a 22-degree angle-of-draw. The Division reviewed the annual Skyline subsidence reports and those of neighboring mines, and the geology of the North Lease area and found no evidence to suggest that the angle-of-draw would change. Therefore, the Division will allow the Permittee to use a 22-

degree angle-of-draw instead of a 30-degree angle-of-draw. See R645-301-525.540 for details of the rebuttable presumption of causation by subsidence.

- The Permittee has provided the Division with a faxed copy of the State-appropriated water survey which was mailed to the property owner (U.S.F.S) and the water conservancy district on November 20, 2002.

Subsidence Control Plan

The mining of the North Lease includes undermining of perennial streams. As a portion of the Subsidence Monitoring Plan, drawing 2.3.6-2 has been provided which identifies the projected North Lease workings, areas of the permit area with less than 700-ft of cover, potential subsidence contours, and the Monthly North Lease Flow Monitoring Points. These flow monitoring locations (seven (7) total sites) will be monitored beginning at least 6-months prior to the area being mined, and continued to be monitored for at least 6-months after the area has been mined. Frequency of monitoring will be on a monthly basis; weather permitting. The additional information adequately identifies the areas of potential subsidence, and adequately monitors potential adverse impacts due to subsidence.

Components of the subsidence control plan are as follows:

- Map No. 3.3-2 and map No. 3.1.8-2 show the timing and sequence of mining operations. The Permittee has stated that except for development work all mining will be done with longwall equipment. The use of longwall equipment means that most subsidence should take place within weeks of mining and the ground should stabilize after six months.

- The Permittee must include map(s) that show the location and extent of the areas in which planned subsidence mining methods will be used and that identifies all areas where measures will be taken to prevent subsidence or subsidence related damage. No areas exist in the projected subsidence zone for the North Lease that need special protection.

- The physical conditions, such as depth of cover, seam thickness and lithology overlaying strata that affects the likelihood or extent of subsidence and subsidence related damage is contained in the geology section. That information is in the geology section of the PAP and is considered adequate.

- A description of the monitoring that is needed to determine the commencement and degree of subsidence. The Permittee did not address this issue in the PAP, with the exception of showing the location of subsidence monitoring points. Those points are shown on drawing No. 4.17.5-1. However, in the MRP the Permittee does describe a subsidence-monitoring program (MRP, Section 4.17.5). The monitoring program in the MRP is considered adequate.

- The subsidence-monitoring program uses aerial photography to determine the amount of subsidence and area affected. The Manti-LaSal National Forest Service developed the program. Most coal mines in Utah use aerial photography. Due to the rough terrain, monitoring survey points with terrestrial surveying is impractical.

- Terrestrial surveys are most useful for locating cracks and other subsidence features. The Permittee has committed to doing annual on-the-ground visual inspections of the ground surface of subsided areas.

- The Permittee has not identified any areas that need protection from subsidence damage.

- The Permittee described the measures to be taken in accordance with R645-301-731.530 and R645-310-525.500 to replace adversely affected, State-appropriated water supplies or to mitigate or remedy and subsidence-related material damage to the land and protected structures as follows:

In Section 2.5.3 of the PAP the Permittee states the following about replacement of State-appropriated water supplies.

> *"The restoration of water flows to impacted sources will be accomplished using the Best Technology Currently Available (BTCA). These activities may include, but not necessarily be limited to: transferring water rights to the injured party in flow equal to the determined loss; piping or trucking water to the location of the loss; sealing surface fractures to prevent further losses (i.e., stream floors on bed rock or in shallow alluvium); and, construction of a ground water well and the installation of pumps to restore flows; and monetary reimbursement for proven material damages. If the above efforts are not successful, the Skyline will explore the transferring water rights to the injured party in flow equal to the determined loss and/or monetary reimbursement for proven material damages."*

Part of any mitigation plan is to restore the land to the pre-mining land use. The land use is often associated with the availability of water. Therefore, any interruption of water supplies could affect the land use. The preferred method of mitigation is to restore the water supply. That can be done in a number of different ways including restoration of a spring or seep, sealing cracks and fissures or possibly drilling a well. Other alternatives include piping or trucking in water.

In some cases, the there is no economical or technically feasible way to restore water at the source. The only options for mitigation are to either transfer water right shares or to make

monetary reimbursement. When all other options have been exhausted the Division will allow transfer of water rights and monetary reimbursement.

- In the MRP, the Permittee makes a general commitment to repair damage to surface lands and to non-commercial buildings and dwellings and related structures. A general commitment is acceptable to the Division because of the difficulty in predicting what type of mitigation would be needed.

- In accordance with R645-301-545.542, the Division has reviewed the information in the annual subsidence reports and the geology in the North Lease and found that a 22 angle-of-draw to be adequate for the North Lease. There are no buildings or structures in the North Lease permit area.

Performance Standards For Subsidence Control

In addition to the performance standards required by Utah Regulation, the Permittee will be required to meet the stipulations placed on the lease by the Forest Service. Of particular importance to subsidence control is Forest Service Lease Stipulation #9 that reads,

"*Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to existing surface structures, and (3) damage or alter the flow of perennial streams. The lessee shall provide specific measures for the protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created.*"

Notification

The Permittee has mailed notification to the water conservancy district and to the surface land owner (U.S. Forest Service) concerning the identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined. The Permittee has committed in Section 4.17.7 to provide the U.S. Forest Service with annual updates of subsidence information.

Findings:

Information provided in the plan is adequate to meet the minimum requirements of the regulations.

FISH AND WILDLIFE INFORMATION

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

Analysis:

Protection and Enhancement Plan

Potential impacts from mining would be best characterized as habitat loss. Since there will be no surface disturbance the only potential impact would be habitat loss resulting from subsidence. The current application anticipates mining underneath perennial streams but this permit approval will only allow first mining. Prior to approval of full extraction protection measures must be identified. The application must include a description and protection measures from subsidence of specific areas where habitat loss might occur.

Endangered and Threatened Species

According to the 1995 Environmental Assessment written jointly by the USFS and the BLM, the listed threatened, endangered and/or sensitive species that may occur within the proposed lease area are the Bald Eagle, Northern three-toed woodpecker, and Northern Goshawk. Suitable bald eagle nesting habitat does not occur in the permit area. The bald eagle would only occur as a winter resident and surveys will not be conducted. The Permittee has committed in the application to conduct a raptor survey in the early summer of 2003. A survey for the three-toed woodpecker must also be conducted. If either of the species noted in the EA are observed, the application should then describe protection measures (as noted in the previous section).

Threatened and endangered species occurring in the Carbon County area are evaluated in the following table.

Table 1. Federally listed threatened and endangered species for Carbon County and potential occurrence on the North Lease.

Common Name		Habitat	North Lease Habitat
Uinta Basin Hookless Cactus	T	Gravelly hills on Quaternary and Tertiary alluvium, cold desert shrub community	Occurs in N and E portion of Carbon County, no habitat in the permit area
Graham Beardtongue	C	Shaley talus knolls, desert shrub and P-J,	Restricted to the Uintah Basin
Bonytail Chub	E	Endangered fish of the Colorado River.	No surface water diverted for mining activity.
Colorado	E	Endangered fish of the	No surface water diverted for

Pikeminnow		Colorado River.	mining activity.
Humpback Chub	E	Endangered fish of the Colorado River.	No surface water diverted for mining activity.
Razorback Sucker	E	Endangered fish of the Colorado River.	No surface water diverted for mining activity.
Bald Eagle	T	Nests in tall trees such as Cottonwoods.	No breeding habitat, may fly through the area
Mexican Spotted Owl	T	Nests in areas with >40% slope, 2000 habitat model	2000 model shows habitat for foraging. No surface disturbance.
Western Yellow-billed Cuckoo	C	Occurs in tall shrub/tree riparian areas at least 30 feet wide on each side and 12 feet tall.	No habitat in permit area.
Black-footed Ferret	E	Forages on prairie dogs, cold desert shrub habitat.	No prairie dog towns in permit area. Extirpated from Carbon County.

Surface water depletions of more than 100 acre/ft/yr adversely affect four listed threatened and endangered fish species of the upper Colorado River drainage. Consequently, the U.S. Fish and Wildlife Service require mitigation when water depletions exceed 100 acre-feet annually. Section 2.5.3 addresses the water consumption from mining activities. Page 2-51 c & d of this section indicates that water consumption from surface and underground mining activities is approximately 51,870,720 gallons/yr (159 acre/feet/year). None of the water consumed is from surface sources nor does it deplete surface water sources. Also on page 2-51d is the projected mine water discharge rate of 2,800 gpm (4517 acre/ft/yr) to Eccles Creek. The Permittee maintains that this water is 4,000 to 25,000 years old and the upper Colorado River drainage is benefiting from this discharge, which is far in excess of the mine water usage.

Bald and Golden Eagles

Bald eagles are not common in the area during the winter but could occasionally fly through or roost in the proposed addition to the permit area. Mining would have negligible effects on these birds. The Forest Service stated that Bald Eagles are frequently seen around Scofield reservoir in October and November. After the reservoir freezes the waterfowl leave as do the eagles.

Wetlands and Habitats of Unusually High Value for Fish and Wildlife

The perennial streams, springs and riparian areas within the proposed lease area would be considered habitats of high value for fish and wildlife. The 1995 EA reports that the riparian

habitat appears to be in excellent condition on the forest (in the North Lease area), but below the forest boundary to the east it has been heavily impacted by livestock grazing.

The applicant has committed to surveying perennial flows in the lease area for fish and amphibian habitat. **The Division, the USFS, and the USFWS and the UDWR will determine the survey protocol, scope and level of detail.**

Findings:

The information contained in this section of the application is adequate to meet the requirements the regulations.

Prior to second or longwall mining the Division will require the following:

(1) The development and implementation of a mitigation and protection plan in cooperation with The USFWS for the additional 59 acre- feet/year of water used for mining consumption.
(2) A description of specific areas where habitat loss might occur from subsidence and then describe specific protection measures that will be provided.

VEGETATION

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

Analysis:

The plan indicates in Section 2.7.6 that there are no anticipated surface effects to the North Lease permit area. Regardless, the Forest Service Lease Stipulation # 7 requires monitoring of effects of mining, as follows:

"The Lessee shall be required to establish a monitoring system to locate, measure and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data."

The approved MRP indicates in Section 4.17.5 that an aerial photogrammetric monitoring program will be used to "determine the effects of underground coal mining on surface renewable resources. The plan indicates that the monitoring program secures adequate baseline data prior to any subsidence to quantify the existing surface renewable resources…."

The application indicates on page 2-63d that aerial photographs were taken in August 2002 of the North Lease Tract to provide a baseline information. They are available for viewing at the mine site. Aerial photographs will continue to be taken annually, be interpreted by a qualified person, and a report will be provided in the Annual Report for the Skyline Mine (page 2-63d).

Color infrared aerial photography (CIR) on the same scale as the photogrammetric monitoring is also described in the MRP section 4.17.5.

When monitoring identifies surface effects are diminishing habitat, protective measures are required to be developed (R645-301-333.200) for species identified under R645-301-322.

Findings:

Information provided in the application is not adequate for the purposes of species and habitat protection during Operations.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

There will be no changes to the following material handling systems: disposal of noncoal mine waste, coal mine waste, refuse piles, impounding structures, burning and burned waste utilization, return of coal processing waste to abandoned underground workings or excess spoil.

Refuse Piles

Page 3-57 of Section 3.2.8 of the application indicates that the Scofield waste rock site has been filled to 70% of its 300,000 tons capacity. The Permittee anticipates 40,000 tons of waste rock being generated during development mining in years 2002 and 2003, leaving only 40,000 tons of capacity at the waste rock site. After development, the Permittee anticipates generating10,000 tons of waste annually. Thus, the Scofield waste rock site has four years of remaining capacity after development mining.

Longwall mining of the Lower O'Conner A seam will entail an evaluation of the Permittee's life-of-mine disposal requirements.

Findings:

Information provided in the application is adequate for the purposes of Spoil and Waste Material Operation Plan during development mining. The Division will evaluate the Permittee's plans for life-of-mine disposal requirements prior to approval of longwall mining the Lower O'Conner A seam.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Tables 2.3.7-1, 2.3.7-2, and 2.3.7-3 have been modified to include additional monitoring associated with the North Lease. Section 2.3.7 – Groundwater Monitoring Program has also been modified to provide a better understanding that (except where noted) samples are obtained at the monitoring sites three (3) times a year. A brief discussion why this monitoring schedule was selected is also included. This adequately addresses previous Division concerns in this section.

Surface Water Monitoring

Tables 2.3.7-1, 2.3.7-2, and 2.3.7-3 have been modified to include additional monitoring associated with the North Lease. Section 2.4.4- Surface Water Monitoring Program has also been modified to provide a better understanding that (except were noted) samples are obtained at the monitoring sites three (3) times a year.

As outlined in the Section 2.5 – Hydrologic Impacts of Mining and Section 2.12 – Land Use, in conjunction with the surface water monitoring analyses additional bank stability and vegetation studies are being conducted along Eccles and Mud Creek to evaluate any impacts caused by mine discharge. Plate 2.3.6-2 – North Lease Subsidence Hydrologic Monitoring Points has also been added to the surface water-monitoring schedule to evaluate impacts to the perennial nature of the Winter Quarters drainage basin caused by subsidence. Any additional discharge to Eccles Creek from mining in the North Lease area is anticipated to be minimal and

short-lived. Also, based primarily on studies conducted in Burnout Canyon, impacts on flow caused by subsidence are anticipated to be minimal, if any, as well. The modifications made to the Surface Water Monitoring program adequately address previous Division concerns.

Section 2.4.2 – Surface Water Hydrology, Flow Characteristics, has been modified to include a discussion indicating that mining conditions encountered from 1999 until present has temporarily altered the flow characteristics in Eccles and Mud Creek. Daily mean flow in Eccles Creek has increased from less than 1 cfs to greater than 25 cfs.
The percentage increase in Mud Creek hasn't been as great since it is a larger stream with other streams contributing to its flow. However, even with the increased mean daily flows, preliminary streambank and vegetation studies indicate the effects to the streams are minimal. Text continues by adding that modifications to mining in the southern portion of the permit area and the move to mining in the North Lease area anticipate a significant reduction in mine discharge. The reader is directed to the PHC, Section 2.12, and relevant attachments/appendices for a detailed discussion. This information adequately addresses earlier Division concerns.

Due to increased mine discharges, the Sediment Yield to Scofield Reservoir / Price River basin has changed. Section 2.4.3 has been modified to acknowledge this situation is being monitored as part of the studies outlined in the July 2002 Addendum to the PHC and Section 2.12 – Land Use, Attachment #3 of the MRP, and being reviewed on an annual basis.

As discussed above, the Division's concerns written in the Technical Analysis dated October 22, 2002 have been adequately addressed.

Water-Quality Standards And Effluent Limitations

In Section 2.5.2 – Mining Impacts on Water Quantity (page 2-51a – 2-51b), a discussion outlines that the unanticipated discharges currently being generated greatly exceed the UPDES permit that was written when the mine was opened. Flows were expected to be less than 1,000 gpm and the limits on total dissolved solids (TDS) were created based on that volume. The initial flow increases encountered from 1999 through 2001 had problems with the toxicity caused by nickel concentrations and high TDS. With the significant inflow to the mine from the 10 Left area and changes of how water is handled underground resulted in a decline in TDS and dissolved nickel over time. With the mine discharge currently at approximately 9,500gpm (November 2002), a 7.1 ton/day limit of TDS (as currently assigned) is being exceeded on a continual basis. The daily tonnage is being exceeded due to the volume being discharged, however the water being discharged has TDS concentrations of less than 500 mg/l. The Mine and the Utah Division of Water Quality are currently working on modifying the Mine's UPDES discharge permit to limit the water discharged to a 500 mg/l concentration of TDS and no total ton-per-day limit. The Division has also required additional water monitoring sites in Eccles, Mud and Clear Creeks to include flow, TDS, TSS, and total phosphorus to monitor this issue. These steps adequately address previous Division concerns.

Findings:

The information provided adequately addresses the minimum requirements of the Operation Plan – Hydrologic Information section of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

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

Analysis:

Affected Area Maps

The Division usually considers the affected area to be the same as the permit area. The affected area may include areas that the Permittee has not yet acquired or permitted but plans to do so in the future. Drawing No. 1.6-3, Skyline Mines Permit Area, shows the location of the permit boundaries.

Mining Facilities Maps

No new surface mining facilities will be constructed.

Mine Workings Maps

Drawing No. 2.2.7-7 shows the location of abandoned mine workings in and around the permit area. The horizontal distance between the proposed workings and the abandoned mine is 50 feet. The map also shows the existing and proposed workings.

Drawing No. 3.3-2, Lower O'Conner "A"/Flat Canyon Five Year Projected Mine Plan, show the location of the current and proposed mine workings. Douglas E. Johnson, a registered professional engineer, certified that map.

Monitoring and Sampling Location Maps

The submitted maps adequately address the area with the addition of the North Lease area, with the exception of items outlined in other areas of this technical analysis.

Certification Requirements

All maps that require certification have been certified.

Findings:

The information provided meets the minimum requirements of the Operation Plan – Maps, Plans, and Cross Sections of Mining Operations section of the regulations.

RECLAMATION PLAN

GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

No surface disturbance is proposed within the North Lease Permit Area. Therefore there is no information in the submittal for approximate original contour, reclamation of a disturbed area, backfilling and grading, mine openings and road system reclamation, stabilization of surface areas or post-mining land use.

Small areas associated with drill hole disturbance will be reclaimed. Reclamation of the drill holes is outlined under the exploration permit.

Since no new surface facilities or disturbance will occur because of the North Lease Extension, a bond adjustment is not required at this time.

Findings:

The information provided is adequate for the purposes of the regulations.

HYDROLOGIC INFORMATION

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

Analysis:

Hydrologic Reclamation Plan

In Section 2.4.4 of the MRP the Permittee commits to continued sampling 'throughout the post-mining period until the reclamation effort is determined successful by the regulatory authority'. This adequately covers the Hydrologic Reclamation Plan.

Findings:

The information provided adequately addresses the minimum requirements of the Reclamation Plan – Hydrologic Information section of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

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

Analysis:

Affected Area Boundary Maps

The Division usually considers the affected area to be the same as the permit area. The affected area may include areas that the Permittee has not yet acquired or permitted but plans to do so in the future. Drawing No. 1.6-3, Skyline Mines Permit Area, shows the location of the permit boundaries.

Bonded Area Map

The bonded area usually is the same as the disturbed area. Since there will be no additional surface disturbance there is no need to change the bonded area maps at this time.

Reclamation Backfilling And Grading Maps

There will be no changes to the backfilling and grading plans because of the North Lease Extension.

Reclamation Facilities Maps

No new reclamation facilities will be associated with the North Lease Extension.

Final Surface Configuration Maps

The final surface configuration will not change because of the North Lease Extension.

Reclamation Surface And Subsurface Manmade Features Maps

No new surface or subsurface manmade features are associated with the North Lease Extension.

Findings:

Information provided in the PAP meets the minimum regulatory requirements of the Maps, Cross-Sections, of Reclamation Operations.

BONDING AND INSURANCE REQUIREMENTS

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

Analysis:

Since no new surface facilities or disturbance will occur because of the North Lease Extension, a bond adjustment is not required at this time.

Findings:

Information provided in the PAP meets the minimum regulatory requirements of the Bonding and Insurance Requirements.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

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

Analysis:

The Permittee has provided sufficient information concerning the North Lease addition to the Skyline Mine permit area for the Division to make a determination of the impacts to the cumulative hydrologic regime. The Division has determined the mining of the North Lease will have minimal if any impacts on the Cumulative Hydrologic Impact Area based on the following provided information:

- The proposed mining is a continuation of Mine #3 where no significant in-mine water was encountered; making no significant contribution to mine discharge.
- Based on Burnout Canyon subsidence studies, where two seams were mined, minimal impacts to the perennial nature of surface hydrology were noted due to subsidence. Only one (1) seam of mining is proposed in the North Lease area.
- The provided geologic information indicates the mine is located on a 'dome-like' feature; Mine #3 dips northwest while Mines #1 and #2 dip west southwest, and the hydrologic regime in Mine #3 is different and not in communication with the hydrologic regime of Mine #2 or Mine #1.
- In-mine mechanical tests conducted on the rocks in Mine #3 are in a state of compression (similar tests in Mine #2 indicate the rocks are in extension), which will further limit the hydraulic conductivity of the geologic units holding any potential water.
- Groundwater wells and exploration drill holes in the North Lease area indicated minimal water production potential.
- Adequate surface-water, groundwater, stream bank stability, and subsidence monitoring plans have been outlined to identify adverse impacts, should any begin to occur.

Findings:

The information provided in the submittal adequately addresses the minimum requirements of the regulations. The Division finds that mining of the North Lease has been designed to minimize impacts within the permit area and to prevent material damage outside the permit area.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

MUD CREEK BASIN
AND
UPPER HUNTINGTON CREEK BASIN

Skyline Mines
C007/005

White Oak Mines
C007/001

Carbon, Emery, and Sanpete Counties, Utah

Prepared by

Utah Division of Oil, Gas, and Mining

Latest Revision

November 21, 2002

I. INTRODUCTION

The Skyline and White Oak mines are located in the northern Wasatch Plateau Coal Field, approximately 5 miles southwest of Scofield Reservoir and 25 miles west of the city of Price, Utah. Castle Valley, where the cities of Price and Huntington are located, lies east of the Wasatch Plateau, and farther east is the San Rafael Swell. The Sanpete valley is west of the Wasatch Plateau (Figure 1).

The Skyline leases straddle the drainage divide between upper Huntington Creek and Mud Creek basins. The Carbon - Emery County line lies along this divide. Skyline is mining beneath both basins, but the mine portals are in Eccles Canyon in the Mud Creek basin. Skyline's leases abut the Sanpete County line on the west. The Skyline operation consists of the No. 1, No. 2, and No. 3 Mines. Construction began in 1980. The No. 3 Mine began production in October 1981, the No. 1 in June 1982. A ventilation portal was opened by breakout from the #3 mine into the South Fork of Eccles Creek in 1989. Development of the #2 Mine began in 1992. The end of coal production from the Skyline mines is projected for the year 2015. Associated with the mines are a conveyor down Eccles Canyon, a loadout at the mouth of Eccles Canyon, and a waste rock disposal site in U.P. Canyon near the town of Scofield.

The mines, loadout, and office area of the White Oak Complex, operated by Lodestar Energy, Inc., are the only other actual mining activity in the area. These were operated by Valley Camp of Utah, Inc. and known as the Belina Complex prior to 1994. The mines are located east of and adjacent to the Skyline mines. Access to the White Oak/Belina mines is through Whisky Canyon, a side canyon to Eccles Canyon, but approximately 22 % or 700 acres of the White Oak/Belina permit area is within Huntington Creek basin. Road construction for the White Oak/Belina Complex began in 1975. The White Oak/Belina #1 Mine operated underground from 1979 through June 1998 and the White Oak/Belina #2 Mine operated underground from 1982 through September 2001. A change in the mining method was introduced at the cessation of underground mining at the White Oak/Belina #2 Mine. Surface mining of the White Oak/Belina #1 and #2 mine portal area has been in operation since November 2001. The surface mining of the barrier coal accounts for approximately 47 acres of surface disturbance. The White Oak/Belina loadout and mine office are in Pleasant Valley, just downstream of the Skyline loadout.

White Oak began acquiring baseline data in 1994 with the objective of obtaining a permit to mine coal east of Pleasant Valley and beneath Long Canyon, and possibly beneath the Jump Creek and Beaver Creek drainages. Access is planned to be through one or more portals in the vicinity of the disturbed area at the White Oak/Belina loadout. The additional drainages that may be involved in this expanded operation have not been included in this CHIA.

This Cumulative Hydrologic Impact Assessment (CHIA) is a findings document involving an assessment of the cumulative impact of all anticipated coal mining operations on the hydrologic balance within the Cumulative Impact Area (CIA). The CHIA is not a determination if coal mining operations are each designed to prevent material damage beyond their respective permit boundaries when considered individually. Rather is a determination if

there will be material damage resulting from effects that become cumulative outside the individual permit boundaries.

The objectives of a CHIA document are to:

1.	Identify the Cumulative Impact Area (CIA).	(Part II)
2.	Describe the hydrologic system.	(Part III)
3.	Document the baseline conditions of surface and ground water quality and quantity.	(Part IV)
4.	Identify which hydrologic resources are likely to be impacted and determine which parameters are important for predicting future impacts to those hydrologic systems.	(Part V)
5.	Identify relevant standards against which predicted impacts can be compared.	(Part VI)
6.	Estimate probable future impacts of mining activity with respect to the parameters identified in 4.	(Part VII)
7.	Assess probable material damage.	(Part VIII)
8.	Make a statement of findings.	(Part IX)

This CHIA has been prepared by the Utah Division of Oil, Gas, and Mining. It complies with federal and Utah coal regulations as found in 30 CFR 784.14(f) and R645-301-729 respectively. The Belina Mine CHIA by Engineering-Science (1984) and the Huntington Creek Basin CHIA by Simons, Li, and Associates, Inc. (1984), both prepared for the U. S. Office of Surface Mining (OSM), provided much of the information used in this CHIA. The White Oak/Belina (Valley Camp of Utah, 1993) and Skyline (Coastal States, 1993) Mine Reclamation Plans (MRP) have also been used. The Technical Assessment (TA) for the Skyline Mine permit includes information similar to that required for a CHIA, but a complete CHIA was apparently not prepared at the time the original permit was approved in 1980.

II. CUMULATIVE IMPACT AREA (CIA)

The Cumulative Impact Area (CIA) is shown on Figure 2. This is the area within which the actual and anticipated coal mining activities may interact to affect the surface and ground water. The CIA is determined based on existing mining activities, anticipated mining activities, knowledge of surface and ground water resources, and anticipated impacts of mining on those water resources. Both surface and ground water CIA's have been delineated.

The CIA boundary was last revised in November 2002. The rationale for defining the CIA boundary is explained as follows. The surface water CIA encompasses all of the Mud Creek basin from Scofield Reservoir on the north, to the southern end about 3 miles east of Electric Lake dam. Mud Creek basin includes the ephemeral drainages on the east side of Pleasant Valley, one of which is U.P. Canyon where Skyline's waste rock disposal site is located. White Oak Mine No. 1 and White Oak Mine No. 2 are included within the Mud Creek drainage area. Surface mining methods incorporated in the upper Whisky Creek drainage are included in the Mud Creek drainage. Also included is the Blazon Mine that has been reclaimed, but remains within the UDOGM jurisdiction.

The mountain ridge on the west side of the Mud Creek drainage is also the east side of the Huntington Creek drainage. That ridge, or divide, forms part of the boundary between Carbon and Emery Counties. The north end of the CIA boundary in the Mud Creek drainage is Granger Ridge. Granger Ridge connects the common ridge between Mud Creek & Huntington Creek, to Scofield Reservoir. The north end of the Mud Creek drainage includes the Woods Canyon and Winter Quarters Canyon drainages. This area is included due to the Skyline Mine expansion into this area over the next 7 years.

Scofield Reservoir is included in the CIA due to the fact that Skyline Mine discharges flow down Eccles Creek, into Mud Creek, and into Scofield Reservoir. Before March 1999 mine discharges were on the order of 300 to 400 gallons per minute (gpm). From March 1999 until December 2002 Skyline Mine discharges have increased incrementally up to a maximum of 10,500 gpm. The average flow during this time was 8,000gpm. These flows are expected to decline to about 2,900 gpm in December 2004, but continue for another 5 years. While the pumped flows vary, they are about 10 times the natural flow of Eccles Creek and 3 times the flow of Mud Creek. Normally, Mud Creek is known to contribute 16 % of the annual water budget for the reservoir while at the same time contributing 29% of the nutrient load to the reservoir. This suggests Mud Creek drainage has nutrient-rich soils and increased flows from the mine will increase the nutrient load of the reservoir. Importantly, the increased flows also increase the water volumes to the reservoir and provide considerably more water to the Price River drainage than natural runoff. Other than increased water, it's believed no other hydrologic impacts will be felt downstream of Scofield Reservoir.

The CIA also encompasses all of the Huntington Creek drainage above the mouth of North Hughes Canyon. The area immediately below Electric Lake dam, down to North Hughes Canyon, includes the Valentine Fault which runs through Valentines Gulch and continues north into the area of the CIA where mining has occurred. The CIA includes Electric Lake itself,

which covers from 100 to 450 acres, depending on water level, and contains 30,000 acre-feet of active annual storage. The lake is a contributor to groundwater in the CIA. The Huntington Creek drainage contains what is currently the larger percentage of the Skyline Mine. The CIA boundary contains all of the Huntington Creek drainage area above Electric Lake dam. Included within this drainage is the area west of the existing mine known as Flat Canyon. Current plans for Skyline Mine include mining in the Winter Quarters area over the next 7 years and later continuing mining into Flat Canyon. Drainages on the west side of Huntington Canyon that are part of the CIA include Bear Canyon, Little Eccles Canyon, Boulger Canyon, Flat Canyon, Swens Canyon, Little Swens Canyon, Brooks Canyon, and Upper Huntington Creek.

The western boundary of the CIA is Gooseberry Creek. This includes the area between the west edge of the Huntington Creek drainage and Gooseberry Creek. The Gooseberry Fault runs north-south through this region and is believed to form a boundary to groundwater flow. The surface hydrology, including springs along the fault escarpment, was extended west to Gooseberry Creek. Similarly, the Pleasant Valley Fault runs north-south along the Mud Creek valley and is believed to form a boundary to groundwater flow. Included between these two fault systems are White Oak Mines No.1 & No. 2, the existing Skyline Mine, the Winter Quarters/North Lease of Skyline Mine, and possible future expansion of Skyline Mine into Flat Canyon. The north end of Huntington Creek drainage joins the north end of the Mud Creek drainage at Granger Ridge to complete the Cumulative Impact Area. The total CIA area is about 54,936 acres with about 28,034 acres in the Mud Creek drainage, about 26,002 acres in the Huntington Creek drainage, and about 900 acres in the Gooseberry Creek drainage.

III. HYDROLOGIC SYSTEM

The CIA is located in both the Mud Creek and upper Huntington Creek basins, headwater basins of the Price and San Rafael Rivers, respectively. The Price River flows generally southeast and passes through the city of Price. Huntington Creek flows generally east. It emerges from the Wasatch Plateau near the town of Huntington and joins with Cottonwood and Ferron Creeks on the east side of Castle Valley to form the San Rafael River. The Price and San Rafael Rivers are tributaries to the Green River, which in turn is tributary to the Colorado River.

Precipitation on the Wasatch Plateau varies from 40 inches at higher elevations to less than 10 inches at lower elevations, 70% to 80% falling as snow from October to April. Precipitation averages 22 to 26 inches per year at the Skyline minesite. Skyline Mine is a weather reporting station. It averages more than 30 inches per year on the higher ridges and in the upper Huntington Creek basin (Coastal, 1993; Simons, Li, and Associates, 1984). Actual and potential evapotranspiration rates are roughly equal (less than 18 inches per year) in the upper elevations of the Wasatch Plateau (Waddell and others, 1983b). Probably less than 5% of the precipitation recharges the ground water system (Price and Arnow, 1979). The Wasatch Plateau is classified as semiarid to subhumid.

Vegetation varies from Sagebrush/Grass and Desert Shrub communities at lower elevations to Spruce/Fir/Aspen and Mountain Meadow communities at higher elevations. Other vegetative communities include Mountain Brush, Pinon-Juniper/Sagebrush, Ponderosa, and

Riparian (Simons, Li, and Associates, 1984). These communities are generally used for wildlife habitat and livestock grazing. Even though slopes are steep, vegetation is generally thick and soils with high organic content are well developed, providing an adequate medium for ground water recharge (Coastal, 1993, p. PHC2-5).

Surface Water

Mud Creek basin is an asymmetric watershed. Watersheds on the dominant west flank contain perennial and ephemeral streams that flow eastward to Mud Creek through straight, deeply incised canyons. Small, ephemeral watersheds drain to Mud Creek from the east flank of the basin.

Mud Creek flows north through Pleasant Valley to Scofield Reservoir and normally constitutes around 16% of the annual flow to that reservoir (Valley Camp, 1993, p. 40). Since March 1999 inflows to Skyline Mine were pumped to abandoned underground workings and pumped to Eccles Creek. While there are estimates of the amounts, the actual quantities pumped to Eccles Creek are unknown. Discharges have been recorded since August 16, 2001, and from then through November 1, 2002, have varied from 4,500 gpm to 10,500 gpm, with an average of about 8,000 gpm. The volume of water pumped as of November 1, 2002, is 15,572 Acre-feet to Eccles Creek, Mud Creek, and Scofield Reservoir. This has increased the flow in Eccles Creek to about 10 times the average annual amount and increased flow in Mud Creek to about 3 times the average annual amount. Flows are still only about 20% of spring runoff rates. Pumping is expected to decline to about 2,900 gpm in December 2004, but continue at that rate for another 5 years. Normally, Mud Creek contributes 16 % of the annual water budget for Scofield Reservoir while contributing 29% of the nutrient load to the reservoir. Fish Creek supplies approximately 75% of the annual flow into Scofield Reservoir (Waddell and others, 1983b, p. 43) and Pondtown, Lost/Dry Valley, and Miller Canyon Creeks add the rest. The Price River, which is used for irrigation in Castle Valley and provides the municipal water supply for the city of Price, flows from the reservoir.

The upper Huntington Creek basin, approximately 20,000 acres (18,000 acres in the CIA), is drained by both perennial and ephemeral streams. These streams flow into Electric Lake, which is a reservoir owned and operated by Huntington Cleveland Irrigation Company. One of the major water rights holders in that company is Pacificorp (formerly Utah Power and Light Company) who use their water to cool the coal-fired electric generating plant located downstream along Huntington Creek. The discharge of upper Huntington Creek has been regulated by this reservoir since its construction in 1973.

Surface Water Usage

Hansen, Allen, and Luce, Inc. conducted a survey of water rights for Valley Camp of Utah in 1990. The survey covered most of the CIA. One-hundred ninety-four surface water rights were found, 106 for stockwatering, 25 for irrigation, 55 undeclared, and the remaining 8 for other uses. Skyline Mine conducted an updated survey of the water rights in their permit area in 2002, in conjunction with the addition of the Winter Quarters/North Lease. Most perennial and ephemeral streams in the CIA have water rights filed on them.

Ground Water

Ground water is found principally in two configurations within the CIA: numerous small, localized perched systems related to discontinuous sandstone lenses in the Blackhawk Formation, and a continuous regional system in the coal seams and adjacent rocks of the lower Blackhawk Formation and the underlying Star Point Sandstone. A principal factor influencing the distribution and availability of ground water in these systems is the geology.

Geology

Stratigraphy

An offlap (regressive) sequence is exposed in the outcropping Cretaceous rocks within the CIA. Strata exposed in and adjacent to the CIA, shown on the geology map on Figure 3 and the generalized cross-section on Figure 4, range in age from Late Cretaceous to Tertiary (Eocene).

The oldest rocks exposed in or adjacent to the CIA are upper members of the Mancos Shale, which crops out in Huntington Canyon below Electric Lake and forms the surface of Castle Valley. The Mesaverde Group overlies the Mancos Shale and consists of the Star Point Sandstone, Blackhawk Formation, Castlegate Sandstone and Price River Formation. Overlying the Mesaverde Group are the North Horn and Flagstaff Limestone of the Wasatch Group, deposited in the very late Cretaceous and Tertiary periods. Except for well developed soils in Pleasant Valley, quaternary sediments are generally limited to narrow, thin alluvium and colluvium deposits along valley bottoms.

The Mancos Shale consists of marine shales interbedded with sandstones and minor amounts of limestone. These shales are good aquicludes, with low horizontal and vertical permeabilities even near faults. The Mancos is a thick, regional aquaclude that hydrologically isolates deeper strata from the coal mining and reclamation operations considered in this CHIA. The Masuk Shale Member at the top of the Mancos grades upward into the Star Point Sandstone, and westward-thinning wedges of marine shale intertongue with and are considered part of the Star Point.

The Star Point Sandstone was deposited in a barrier-beach environment. It consists of three main tongues – from lowest to highest, the Panther, Storrs, and Spring Canyon - that thin eastward and are separated by tongues of marine shale. Bedding in the sandstones is often massive. West of the outcops along the Wasatch Plateau escarpment, the sandstone tongues thicken and merge and then grade into the backbarrier, coastal plain, and deltaic deposits of the Blackhawk Formation. Because of the regressive depositional sequence, the lowest Blackhawk coal seam – the Hiawatha or O'Conner - usually lies on or just above the top of the Star Point Sandstone.

Doelling (1972) described the Star Point as almost devoid of shale in the Scofield area. Spieker (1931, p. 25) described the Star Point as uniformly 400 to 500 feet thick in exposures

along the Wasatch Plateau escarpment, between Gordon Creek (west of Helper) and Ferron Canyon, but also noted the Star Point is 600 feet thick in central Huntington Canyon and over 1,000 feet thick along Mud Creek. A petroleum exploration well drilled just west of the Skyline Mine (in NE1/4 SE1/4 Sec 16, T. 13 S., R. 6 E) encountered a 1,200-foot thick sequence of Star Point Sandstone that consisted of sandstone layers, with a combined thickness of over 800 feet, interbedded with shale.

The Star Point is generally a poor aquifer, due in part to low permeability shale lenses, but water bearing characteristics are greatly enhanced by localized faulting, fracturing, and jointing. The large discharge and low seasonal variability of baseflow to Mud Creek and of springs along the Pleasant Valley fault zone indicate the Star Point has a large storage coefficient and relatively high transmissivity (Wadell and others, 1983b, p. 78).

The Blackhawk Formation consists of approximately 1500 to 1900 feet of lenticular claystones, siltstones, sandstones, and coal seams deposited in backbarrier, coastal plain, and deltaic environments. Claystones contain high percentages of montmorillonite and other swelling clays (Coastal, 1993, p. PHC2-3). The Blackhawk is the main coal bearing formation in the Wasatch Plateau. The important coal seams occur in the lower 350 feet, which is the section that intertongues with the Star Point Sandstone. The lower Blackhawk and Star Point Sandstone are usually considered to be one continuous aquifer.

Fluvial channel sandstones are found in the lower Blackhawk but are more frequent toward the top of the formation. These sandstones are local in extent, generally fine grained, and well cemented. They have localized high clay content. The discontinuous character of these channel sandstones and the abundance of clay throughout the Blackhawk Formation produce perched aquifers and favor formation of local flow systems that discharge through numerous seeps and springs.

The Castlegate Sandstone, the basal part of the Price River Formation, is typically massive, resistant to erosion, and white to gray in color. It consists of fluvial pebble conglomerates and fine- to coase-grained, argillaceous sandstones with some shale. It is carbonaceous in the Book Cliffs, but coal is thin and lignitic. The Castlegate Sandstone is good aquifer material, with seeps and springs common at the Castlegate-Blackhawk contact. The Price River Formation is light-colored, medium-grained and shaley sandstone interbedded with roughly an equal volume of darker, carbonaceous shale or mudstone. There are large point-bar sandstones, and also minor amounts of coal.

The Mesa Verde Group is overlain by the North Horn Formation, which is exposed along the top of the ridge in the western part of the CIA. The North Horn is composed of bentonitic, calcareous, silty shales interbedded with thin limestones and fine-grained sandstones and minor amounts of conglomerate. There are lenticular channel-sandstones throughout, enclosed by the fine-grained shales.

Still farther west and outside the CIA, the Tertiary Flagstaff Limestone is the youngest consolidated rock in the region. Fracturing and dissolution can produce good permeability in

this lacustrine limestone, and it is an aquifer where it is thick and extensive enough to receive and store adequate recharge.

Structure

Surface elevations vary from 7600 feet to 10400 feet within the CIA, with the Star Point Sandstone and Blackhawk Formation outcrops forming most of this relief.

The CIA lies on the Clear Creek anticline, primarily on the west flank. Dips on the west flank range from three to six degrees, to the southwest at the south end of the CIA and to the northwest at the north end.

The Pleasant Valley fault zone, one segment of a regional fault zone that extends north-south across the Wasatch Plateau, lies on the axis of the Clear Creek anticline. Total vertical displacement is 800 to 900 feet, down to the east. Intertongued Star Point Sandstone and Mancos Shale crop out west of the fault zone but Blackhawk Formation crops out on the east. Mud Creek flows north along the Pleasant Valley fault zone to Scofield Reservoir, where the fault zone broadens to become the Pleasant Valley Graben. U.P. Canyon, where Skyline's waste rock disposal site is situated, also follows one of the faults of this zone. Strata east of the fault zone but within the CIA are generally flat lying (Figure 3).

Other major faults in the CIA are high-angle, normal, and run north-south to northeast-southwest. Movement is dominantly down to the west. The largest of these faults, with up to 350 feet of displacement, is the O'Connor fault that obliquely transects the White Oak/Belina permit area. The Connelville fault, a zone up to 1000 feet wide and with up to 250 feet cumulative vertical displacement, separates the Skyline and White Oak/Belina mines. Upper Huntington Creek and Electric Lake lie along the Upper Joes Valley fault zone, which is paralleled on the east by the Valentine fault. The Joes Valley, Valentine, and smaller unnamed faults do not have significant vertical displacement within the CIA. All of these faults gradually die out to the north and do not extend beyond the northern CIA boundary. The O'Connor and Upper Joes Valley faults continue south outside the CIA. Very small displacement faults, oriented roughly east-west, have been encountered in the White Oak/Belina mine and mapped on the surface at the Skyline mine (Figures 3a and 3b). Four major joint and fracture orientations have been mapped underground and at the surface.

Some of the smaller east-west trending faults have been intruded by magma that solidified to form dikes. A major dike passes through the White Oak/Belina mine operations, extending from Mud Creek to the Connelville fault. Coal has been coked adjacent to this dike and has a slightly increased metal content. There is evidence these dikes affect the movement of ground water in the shallow perched systems (Figures 3a and 3b). The majority of the approximately north-south trending faults located west of the Connelville fault, die out or terminate in the area of an east-west trending fault in Sections 22, 23, 24, Township 13 South, Range 6 East. North of this fault, the majority of the faults and fractures trend approximately east -west. These faults appear to be sub-parallel to the Fish Creek Graben located a few miles north of the Winter Quarters/North Lease area. While mining activities were conducted in Skyline Mine No. 3, the in-situ stresses were measured in the rocks. The results indicated the

rocks were in compression in an east-west direction. Similar tests conducted in Skyline Mine No. 2 indicated the rocks were in extension in an east-west direction.

Aquifer Characteristics

In the CIA, the Star Point Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, and Quaternary deposits all contain potential reservoirs or conduits for ground water. Reservoir lithologies are predominately sandstone. Sandstone reservoirs occur where there is sufficient intergranular porosity and permeability in lenticular fluvial-channel and tabular overbank deposits. Shale, siltstone, and cemented sandstone beds act as aquitards or aquicludes to impede ground-water movement. The Mancos Shale is a regional aquiclude that limits downward flow. Localized aquitards can occur within any of the other, more permeable formations. Ground water in the CIA occurs under both confined and unconfined conditions.

Shallow perched ground water systems provide water to the seeps and springs issuing at the Castlegate Sandstone-Blackhawk Formation contact and from sandstone lenses of the Blackhawk Formation. The Blackhawk sandstone lenses are discontinuous and of local extent. Springs and seeps discharge on the slopes at an elevation considerably above nearby streambeds. The majority of seeps and springs issue from the west dipping strata on west facing slopes, often at a shale-sandstone interface. Flow varies seasonally in response to precipitation and snowmelt. The perched systems may provide some flow directly to alluvial and colluvial fill in canyon bottoms, but they do not provide baseflow to sustain perennial streams.

Recharge percolates from the surface downward until shale is encountered. The water then moves downdip and is channeled into discontinuous but more permeable sandstones creating isolated and/or confined aquifers. Water either continues to move downdip until it is discharged at the surface or resumes vertical flow where more permeable zones are encountered. Discharge from most seeps and springs closely tracks precipitation rates, and recharge probably originates in the small surface depressions or basins in the immediate vicinity. Flow along faults and fractures through the Blackhawk Formation appears minimal due to the sealing ability of the clays, but some recharge gets past the perched systems to reach the deeper regional aquifer. The perched and regional systems are separated by unsaturated rock.

A regional ground water system is located in saturated coal and rock of the lower Blackhawk Formation and Star Point Sandstone. Observation wells show the water in this deeper regional system flows beneath the headwater drainages in the CIA and probably has minimal influence on the seeps and springs of the shallower perched systems. The potentiometric surface follows the topography, with a ground water divide roughly beneath the surface divide, and flow is to the southwest and northeast. Water levels in Skyline's monitoring wells fluctuate seasonally, the changes lagging snowmelt and rainfall events by up to two months. A long-term decline of water levels in the wells, typically less than 3 feet per year, is attributed to long-term decreases in precipitation and to dewatering of the aquifer by mining (Coastal, 1993, PHC2-4).

Natural discharge from the regional system occurs as baseflow into Mud Creek and the lower reaches of its perennial tributaries and into Huntington Creek downstream of Electric Lake. Natural discharge also occurs as seeps and springs at faults and along the outcrop of the impermeable Mancos Shale. The Mancos Shale outcrop delimits the lateral extent of this aquifer. Water is unable to flow downward through the Mancos in any significant amount but will flow laterally through more permeable overlying strata until it discharges at the surface. Little is known of the Blackhawk-Star Point aquifer to the west, but it does not crop out and is considered to extend beneath the San Pete valley.

Skyline's monitoring well at the waste rock disposal site shows that the regional aquifer continues in Blackhawk-Star Point strata east of Mud Creek. Water supply wells in alluvium along Pleasant Valley produce from a shallow unconfined aquifer interconnected with Mud Creek. The connection between this alluvial aquifer and the regional Blackhawk-Star Point aquifer is not uniform, but areas have been identified where ground water flows through the Pleasant Valley fault from the regional aquifer to the alluvial aquifer and directly to Mud Creek. During periods of low flow, water in Mud Creek comes mainly from seepage from the regional aquifer (Waddell and others, 1983b, p. 34).

Faulting has only local importance in the Blackhawk Formation because clays tend to seal fractures and stop or restrict water movement. On the other hand the clay content of the Star Point Sandstone is low, fractures are not as readily sealed by clay as in the Blackhawk, and secondary permeability created by fracturing increases the mobility of water through the regional system.

Horizontal and vertical hydraulic conductivities in the Star Point Sandstone, as measured by Core Laboratories, Inc. in Dallas, Texas, are on the order of 10^{-2} ft/day. Horizontal hydraulic conductivities in the Blackhawk range from no measurable permeability to 10^{-8} ft/day in the shales and 10^{-9} to 10^{-7} ft/day in the siltstones. Vertical hydraulic conductivities may be greater or smaller but are within one order of magnitude of the corresponding horizontal hydraulic conductivity. Sandstones in the Blackhawk Formation have hydraulic conductivities similar to those of the Star Point Sandstone (Lines, 1985).

Transmissivity of the Blackhawk was determined to be approximately 18 gal/day/ft (2.4 ft^2/day) by a pair of drawdown and recovery tests in a test well near the Skyline portal. No significant difference was noted between the coal zone and sandstone tongue (Vaughn Hansen Associates, 1979, p. 85). Transmissivity of the entire Blackhawk-Star Point aquifer, based on pump tests and core analyses from the Trail Mountain area, probably ranges from 20 to 200 ft^2/day. Storage coefficient probably averages about 10^{-6} for confined conditions and about 0.05 for unconfined (Lines, 1985, p. 15).

Seeps and Springs

In 1978, 174 seeps and springs were identified on and adjacent to the Skyline permit area, 30% of the sources being seeps. This is roughly one every 40 acres. Higher flows occurred in the springtime. Many seeps and springs dried during the summer and by fall most of the remaining sources flowed less than 2 gpm; only four springs flowed more than 10 gpm. (Coastal, 1993, p. 2-24a and -25a). A survey of the White Oak/Belina mine area in 1978 and 1979 found 94 flowing and 15 dry seeps and springs (Valley Camp, 1993, p. 700-7). In early summer, 8 of the sources had flows greater than 10 gpm, but by autumn most springs were flowing less than 1 gpm and many could not be located (Engineering-Science, 1984, p. 33). Another survey of the White Oak/Belina area in summer of 1990 identified 81 flowing and 43 dry seeps and springs (Valley Camp, 1993, p. 700-7). Anticipating the addition of the Winter Quarters/North Lease tract, another spring and seep survey was conducted in 1993, from which monitoring sites to characterize the area were selected. Monitored springs have exhibited an overall decrease on flow (Coastal, 1993, p, PHC2-6; Valley Camp, 1993,p 700-6). The Skyline and White Oak/Belina surveys probably include duplicate information on many springs because the two permit areas abut.

According to the Seep and Spring survey conducted in the White Oak/Belina area in the summer of 1990, a total of three seeps/springs are affected by the 2001 Surface mining in the area. Seeps/springs S25-13, S25-14, and 30-1 are all located up-gradient of the surface mining. Seep/Spring S25-13 is the only site that provided consistent enough flow to be continually monitored. Recorded quarterly flow measurements from site S25-13 range from 0 to 60 gpm, and average <5 gpm. It is anticipated that any flow from the three seeps or springs will still report to Whisky Creek and not be significantly impacted by the surface mining.

Seeps and springs often issue at a shale-sandstone interface. Flow along faults and fractures through the Blackhawk Formation appears minimal due to the sealing ability of the clays.

No seeps or springs have been found at Skyline's waste rock disposal site (Coastal, 1993, p. 2-30a). There has not been a detailed survey for seeps and springs for the portion of the CIA that is not in or adjacent to the two mine permit areas.

Stream Seepage

Based on flow duration curves, approximately 19% of Huntington Creek streamflow above Electric Lake is attributed to ground water baseflow, but baseflow accounts for nearly 64% of the annual flow in Eccles Creek. This difference is, in part, because the continuous, saturated lower Blackhawk-Star Point aquifer forms approximately 25% of the surface of Eccles Canyon but is not exposed in upper Huntington Canyon. In upper Huntington Canyon ground water comes only from thin, localized, perched aquifers associated with sandstone lenses of the upper Blackhawk Formation (Vaughn Hansen Associates, 1979, p. 63 and 68).

Seepage studies were done in Eccles Creek, South Fork of Eccles Creek, and Huntington Creeks. There is a significant increase of flow in Eccles Creek where the stream crosses onto the

Star Point Sandstone outcrop. There is another significant increase at the O'Connor fault where the fault conveys water through fractured Star Point sandstone to the stream. In comparison, the Connelville fault does not add significantly to flow in either the Main or South Fork of Eccles Creek because potential flow paths through the fractured Blackhawk Formation have apparently been sealed by clays.

Changes of streamflow in Huntington Creek can be largely accounted for by inflow from tributaries and hillside springs. Loss of flow just above Electric Lake is attributed to recharge into the alluvium (Vaughn Hansen Associates, 1979, pp. 68 - 80).

Water in Mines

The coal seams that are mined are in the lower Blackhawk Formation, within strata included in the Blackhawk-Star Point aquifer. Saturated conditions have been encountered in the White Oak/Belina mine and Skyline mines along fracture and fault zones and have persisted as mining has progressed downdip. Similar conditions were found in the Utah #2 mine while it operated. Long-term decline of water levels in the Blackhawk-Star Point aquifer in the vicinity of the Skyline Mines, typically less than 3 feet per year, is attributed to both long-term decreases in precipitation and to dewatering of the aquifer by mining (Coastal, 1993, Figures PHC2-4, July 2002 Addendum to the PHC). Ground water flow into the mines can be characterized as: 1) seepage from the coal seams and associated channel sandstones, 2) flow from Blackhawk channel sandstones that have been fractured by faulting and folding, or 3) flow up from the Star Point Sandstone through the Blackhawk by way of faults and fractures.

Discharge from coal seams and channel sandstones average approximately 10 gallons per minute per active mine face, but flow of 200 gallons per minute was encountered at the Connelville fault in the White Oak/Belina mines. Water production declines rapidly over a short time. Most flows dry up by the time mining has advanced 500 feet beyond them, but an occasional roof bolt will continue to drip up to 2 gpm for an extended time (Coastal, 1993, p. 2-49). The 200 gallon per minute flow from the Connelville fault in the White Oak/Belina mines decreased to 10 to 15 gallons per minute over a four day period. These observations indicate permeability is localized and recharge to the saturated areas is not extensive. Permeable zones in the Blackhawk sandstones are capable of yielding large quantities of water from storage for a short period of time but are not extensive enough to have sufficient storage or recharge to sustain flows. Seasonal fluctuations of inflow have been observed and are attributed to both seasonal recharge and to subsided areas that intercept surface runoff (Engineering-Science, 1984).

Faulting has only local importance in the Blackhawk Formation because the high clay content tends to seal fractures, and movement of water along most faults appears to be effectively blocked or restricted. Of 44 individual fault planes encountered up to 1988 in the Skyline mines, only 5 dripped water from the roof, 4 from where faults intersected sandstone paleochannels. Water discharged up through the floor from the Star Point Sandstone along two other faults (Coastal, 1993,p. 2-24).

Fracturing in the Star Point Sandstone is not as likely to be sealed by clays as in the Blackhawk and as a result secondary permeability created by fracturing tends to increase the

mobility of water through the Star Point. Flows of up to 450 gallons per minute were measured from the Pleasant Valley fault zone in the Utah #2 mine. At different times, flow from the Clear Creek mine portal has been reported to be between 100 and 300 gallons per minute (Waddell and others, 1983b; Engineering-Science, 1984). When UDOGM personnel checked this portal in September, 1993 water was still flowing at approximately the same rate. Most of this water comes into the mine from the Pleasant Valley fault. Water from Mud Creek is intercepted upstream of the mine and reaches the fault by way of abandoned mine workings and through the Star Point Sandstone (Wadell and others, 1983b). Because of the Pleasant Valley fault zone it is expected that mines east of Mud Creek will typically have larger, more persistent flows than mines on the west side.

North Joes Valley fault has little offset and is not a major structural feature within the CIA. Flow of water from the surface into the mine, through the Blackhawk Formation by way of the North Joes Valley fault zone, would not be anticipated because of the sealing clays in the Blackhawk Formation. In addition, the no mining buffer zone should separate mine workings from main sections of the fault along Huntington Creek and Electric Lake. This will reduce the possibility of reactivation of faults by subsidence and subsequent downward flow along the reactivated faults.

Beginning in March 1999, Skyline Mine encountered a series of major water inflows that are summarized in Table 1. These inflows are the largest ever to occur in underground coal mines in Utah.

TABLE 1 Water Inflows to Skyline Mine

Inflow Location	Date	Estimated Initial Flow, gpm	Estimated October 2002 Flow, gpm
14-Left HG	03/1999	1,600	800
16-Left HG	12/1999	1,200	800
W. Submains	03/2000	1,000	300
10-Left	08/2001	6,500	3,200
E. Submain XC5	10/2001	1,000	400
11-Left HG XC24	02/2002	1,000	1,000
11-Left HG XC40	02/2002	1,000	1,500
11-Left Setup Rm.	03/2002	1,500	1,300
	Totals	14,800	9,300

These inflows prompted considerable investigations by the mine and outside consultants. They also necessitated a revision to this CHIA in November 2002. All of the inflows were in Mine 2, which proceeded further west than Mine 1 or Mine 3. All inflows are associated with faults. Based on the investigations of HCI and Petersen, it was determined that the water source is the Star Point Sandstone formation beneath the coal seam. The Star Point Sandstone in the

mine area is believed to consist of 14 sandstone layers totaling 743 feet in thickness. As discussed earlier, this formation has a large storage coefficient and relatively high transmissivity. The large network of fracture planes that make up the regional fracture network provide the surface area necessary to drain the water stored in the matrix of the Star Point Sandstone. Based on ^{14}C age dating and Tritium analysis, the water in the Star Point Sandstone is believed to be of ancient origin and represent an isolated groundwater storage volume that is not in direct connection with the surface.

Immediately after the 6,500-gpm inflow, the mine drilled 2 wells into the fault that intercepted the 10-Left inflow location. The intent was to remove groundwater before it entered the mine and thus reduce inflows. Only one well, JC-1, produced appreciable water and is currently pumping at about 4,000 gpm. This pumping was only marginally successful at reducing inflow waters and was estimated to reduce the inflow no more than 800 gpm while the well was pumping 2,200 gpm (HCI).

Ground Water Usage

Hansen, Allen, and Luce, Inc. conducted a survey of water rights for the White Oak/Belina mines in 1990. The survey covered most of the area in the CIA. A total of 135 ground water rights was found, 112 on springs and 23 on wells or tunnels. Stockwatering was the declared use on 62 of the water rights, 41 were for other uses, and the remaining 32 were undeclared. The information is summarized in Table 724.100a in the White Oak/Belina MRP and the locations are shown on Map 724.100a. Skyline Mine updated the water rights information in their MRP with the addition of the Winter Quarters/North Lease area in 2002. Springs and seeps are important to wildlife, though there are no filed rights that declare this as a use.

Both the Skyline and White Oak/Belina mines utilize water from wells in Eccles Canyon that were drilled into fault zones in the Star Point Sandstone. Wells near the Skyline and White Oak/Belina loadouts in Pleasant Valley produce water from both alluvium and Star Point Sandstone. Water from these wells is for domestic, stockwatering, and other uses.

IV. BASELINE CONDITIONS OF SURFACE AND GROUND WATER QUALITY AND QUANTITY.

Surface Water

Surface water is monitored for quantity and quality at various stations operated by the USGS and the coal mine operators. Locations are shown on Figure 5 and analysis results are found in both the Skyline and White Oak/Belina MRP's, the Mud Creek /Huntington Creek CHIA, and USGS publications. Monitoring has been infrequent or irregular at some stations. With the addition of the Winter Quarters/North Lease tract, additional studies were conducted in Winter Quarters Creek and Woods Creek due to their perennial nature and importance of fishery habitat. The effects of Electric Lake on the water in Huntington Creek have not been determined.

Surface Water Quantity

Average annual yield from the 22,000 acre Mud Creek drainage, as determined from continuous USGS measurements from 1978 to 2001at station 09310700, is 7.3 inches. Discharge rates are summarized in Table 2 Highest discharges result from spring snowmelt (Price and Plantz, 1987).

TABLE 2

Discharge of Mud Creek measured near the town of Scofield.

Gaging Station	Date	Average	Maximum	Minimum
USGS 09310700	1978 - 2001 (continuous)	15.7 cfs	389 cfs	1.4 cfs

Eccles, Winterquarters, Boardinghouse, and Finn Creeks are the principal tributaries to Mud Creek. Based on continuous measurements by the USGS from 1980 to 1984 at station 09310600 (Price and Plantz, 1987), average annual yield from the 3,500 acre watershed in Eccles Canyon is 11.7 inches. The maximum recorded peak flow was 71 cfs in May 1984. Skyline recorded high peak flows in 1983 through 1986. Discharge rates are summarized in Table 3.

TABLE 3

Discharge measured near the mouth of Eccles Creek.

Gaging Station	Date	Average	Maximum	Minimum
USGS 09310600	1980 - 1984 (continuous)	4.70 cfs	71.0 cfs	0.62 cfs
Skyline CS-6	1981 - 2002	6.11 cfs	71.2 cfs	0.54 cfs

Skyline's data indicate water began to be discharged from the #3 mine in 1983, and from 1984 to 1992 discharge averaged 0.50 cfs. Discharge from Skyline Mine #1 began in 1989 and averaged 0.28 cfs from 1989 to 1992. Minimum measured discharges from #1 and #3 were 0.08 cfs and 0.13 cfs and maximums were 0.69 cfs and 1 cfs. In late summer to early autumn when stream flow is naturally low, discharge from the Skyline mines has been estimated to account for as much as 60% to 70% of flow in Eccles Creek.

Prior to the breakout of the ventilation portal in South Fork of Eccles Creek in 1989, maximum measured flow at station VC-10 was 14.7 cfs. Periods of no-flow were observed in

1981, 1984, 1995, 2001, and 2002 but never during the third or fourth quarter of the calendar year (July-December). Average measured flow from 1978 to 1990 was 1.39 cfs (Table 4).

Construction of the road to the White Oak/Belina Mines in Whisky Canyon began in 1975. Monitoring of Whisky Creek began the same year, so there are no data on conditions prior to disturbance of the drainage. Periods of no-flow have been recorded at least once in each of the four calendar quarters (Table 4). Although not as consistently dry, Whisky Creek was periodically dry from 1982 through 2000.

During average flow conditions Whisky Creek (at VC-5) accounts for approximately 8.1 percent and 2.4 percent of the flow of Eccles Creek and Mud Creek, respectively. Upper Whisky Creek at VC-4 accounts for approximately 15.8 percent of the flow of VC-5, 1.3 percent of Eccles Creek, and 0.4 percent of Mud Creek, respectively. The Surface mining and reconstruction of Upper Whisky Creek impacts the area immediately surrounding site VC-4. Any flow lost due to infiltration into the fill from Surface Mining is anticipated to surface further downstream in Whisky Creek. Although a significant loss in flow at VC-4 would impact flows at VC-5, minimal cumulative impacts would be felt at Eccles Creek and Mud Creek.

The location of sample site VC-4 was moved upstream approximately 280 ft. upstream due to disturbance created by the Surface mining. VC-4 represents undisturbed drainage of Whisky Creek. Although moved upstream, only one small ephemeral draw was eliminated from the drainage basin resulting in an insignificant change in flow.

TABLE 4

Discharges measured at South Fork of Eccles Creek and Whisky Creek

Gaging Station	Date	Average	Maximum	Minimum
South Fork Belina VC-10	1978 - 2002	1.39 cfs	14.7 cfs	0 cfs (2 of 4 quarters)
Whisky Creek Belina VC-5	1976 – 2002	0.38cfs	3.70 cfs	0 cfs (4 of 4 quarters)
Whisky Creek Belina VC-4	1977 – 2002	0.06 cfs	1.0 cfs	0 cfs (4 of 4 quarters)

Boardinghouse and Finn Creeks are not directly affected by current mining, but they have been monitored by Valley Camp of Utah and results are summarized in Table 5 (Valley Camp, 1993, p. 700-23). The single reported observation of this stream during a first calendar quarter, in March 1982, found no flow. If coal production were to be increased at the White Oak/Belina

mines, one of these two canyons would probably be the site of an additional mine portal and additional mine water discharge.

TABLE 5

Discharges measured at Boardinghouse and Finn Creeks

Gaging Station	Date	Average	Maximum	Minimum
Boardinghouse Belina VC-11	1980 - 2002	1.6 cfs	12.8 cfs	0.02 cfs
Finn Creek Belina VC-12	1980 - 2002	0.47 cfs	4.20 cfs	0 cfs (4 of 4 quarters)

Winterquarters Creek was monitored by Waddell and others in 1979-1980 and by Skyline in 1981 and 2002. Results are summarized in Table 6.

TABLE 6

Discharges measured at Winterquarters Creek

Gaging Station	Date	Average	Maximum	Minimum
35*	1979-1980	0.405 cfs	0.51 cfs	0.30 cfs
CS-19	June 2002	0.274 cfs		
CS-20	Nov. 1981	0.07 cfs		
	June 2002	0.818 cfs		

* (Waddell and others, 1982)

Skyline currently monitors upper Huntington Creek where it discharges into Electric Lake, at station UPL-10. Flow is measured periodically when the site is accessible, mainly from May to October. From 1981 to 1993 the average flow during these accessible months was 7.8 cfs (Skyline Mines 1993 Annual Report). Utah Power and Light monitored Huntington Creek above Burnout Creek prior to construction of Electric Lake, and the information is found in the report by Vaughn Hansen Associates (1979). Discharge of upper Huntington Creek is summarized in Table 7.

Average flow of Burnout Creek at station CS-7 from 1981 to 2002 was 1.2 cfs, with minimum and maximum measured flows of 0.01 and 10.7 cfs. None of the other tributaries to

Electric Lake are known to be monitored. Flow from Electric Lake, which is not monitored at UPL-3, is regulated for the benefit of downstream users and does not accurately characterize the hydrologic system.

TABLE 7

Discharge of Huntington Creek above Burnout Creek.

Gaging Station	Date	Average	Maximum	Minimum
Utah Power & Light	1971 - 1973	-	>170 cfs	±0.5 cfs
Skyline UPL-10	1981 - 2002	7.7 cfs	79 cfs	0.01 cfs

Predicted average discharge for Eccles Creek, based on flow duration curves for water years 1976 through 1978, is 5.43 cfs, corresponding to a yield of 13.4 inches. Flow duration curves from Huntington Creek above Burnout Creek for water years 1972 and 1973, before Electric Lake was filled, indicate an average annual discharge of 13 cfs and a yield of 16 inches per year (Vaughn Hansen Associates, 1979). The predictions are based on data from different periods, but the higher predicted yield from the upper Huntington Creek basin in comparison to that from the Eccles watershed may be a consequence of the relative impermeability of the Blackhawk Formation that forms or immediately underlies the surface over most of the upper Huntington Creek basin (Coastal States, 1993, p. 2-42), and the westward dip of the strata.

Burnout and Huntington Creeks drain 7900 acres, 40% of the upper Huntington Creek basin, and their combined average discharge has been 6500 acre feet per year (9 cfs). Estimating from the Burnout and Huntington Creek data, discharge from the entire 20,000 acres of the upper Huntington Creek basin would be 16,000 acre feet per year (22 cfs). Based on the predicted average yield of 16 inches, average discharge from the 20,000 acres draining to Electric Lake would be approximately 27,000 acre feet per year (37 cfs). Both estimates seem to be too large because average (1983 to 1993) discharge from the entire 113,900 acres of the Huntington Creek basin, measured at Huntington with a water stage recorder, was 54,480 acre feet per year (75 cfs).

As discussed earlier, Skyline Mine encountered considerable groundwater inflows beginning in March 1999. In an attempt to reduce inflows, wells were drilled in James Canyon and groundwater from a fault was pumped into Electric Lake. From September 2001 until September 2002 water was pumped at about 2,200 gpm. In October 2002 the pumping rate increased to about 4,200 gpm and is expected to continue at this rate until October 2003. After that mine operations and drought or non-drought conditions will determine if the pumping continues. As of November 1, 2002, 3,582 Acre-feet of water had been pumped into Electric Lake and therefore, the Huntington Creek drainage.

All mine inflows have been pumped out of the mine into Eccles Creek. These flows have varied from 4,500 gpm to 10,500 gpm, with an average of about 8,000 gpm as of November 1, 2002. Since pumping records were begun on August 16, 2001 until November 1, 2002, 15,572

Acre-feet of water has been pumped into Eccles Creek, Mud Creek, and Scofield Reservoir. This has increased the normal flows in Eccles Creek to about 10 times normal amounts and increased the normal flows in Mud Creek about 3 times normal amounts.

Because of the large groundwater inflows to the mine, the sequence of mining has been changed. Mine 2, where all the inflows have occurred, will be phased out of operation by the end of 2004. At that time the water pumped to Eccles Creek is estimated to be no more than 2,900 gpm. Mining will continue in Mine 3 in the Winter Quarters/ North Lease until the end of 2009. The 2,900 gpm would continue during that time. Depending on the outcome of hydrogeologic investigations, mining would then move back to Mine 2 and proceed west in the Flat Canyon tract located west of Electric Lake.

It is anticipated the addition of the Winter Quarters / North Lease area will have minimal, if any affect on the water quantity being discharged to Eccles/Mud Creek drainage. Based on passed mining in the area, differences in geology from the southern portion of the Skyline Mine permit area, and lack of apparent communication between groundwater wells located in the northern and southern portions of the permit area only occasional short-term in-flow into the mine are anticipated.

Surface Water Quality

Water within the CIA is used for watering livestock and wildlife, mining coal, domestic use, fisheries, and recreation. Downstream, the water is additionally used for irrigation and industrial needs. Land within the CIA is used for wildlife habitat, grazing, recreation, and mining coal. Anticipated post-mining uses are for wildlife habitat, grazing, and recreation.

Scofield Reservoir is classified (latest classification December 7, 2001) by the Utah Division of Water Quality as:

1C - protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.
2B - protected for secondary contact recreation such as boating, wading, or similar uses.
3A - protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain.
4 - protected for agricultural uses including irrigation of crops and stock watering.

Scofield Reservoir is:

- A culinary water source.
- One of the top four trout fishing lakes in Utah.

- Has over a one million dollar annual recreational fishing value. (E-mail from Louis Berg, Utah Division of Wildlife Resources, to DOGM dated February 4, 2002).

Electric Lake is classified (latest classification December 7, 2001) by the Utah Division of Water Quality as:

2B - protected for secondary contact recreation such as boating, wading, or similar uses.
3A - protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain.
4 - protected for agricultural uses including irrigation of crops and stock watering.

Streams in both basins are classified as:

1C, 3A, and 4.

Furthermore, surface waters located within the outer boundaries of a USDA National Forest, with specific exceptions, are designated by the Utah Division of Water Quality as High Quality Waters - Category 1 and are subject to the state's anti-degradation policy. This anti-degradation policy is that waters shall be maintained at existing high quality and new point source discharges of wastewater, treated or otherwise, are prohibited (Utah Administrative Code, R317-2-3.2 and R317-2-12.1). All of the upper Huntington Creek drainage and most of the headwater drainages of east-flowing tributaries to Mud Creek, including the Skyline mines disturbed area, are within USDA Forest Service boundaries. The White Oak/Belina mines, both loadouts, and the waste rock disposal site are outside Forest Service boundaries.

Total Dissolved Solids (TDS)

Water quality in the CIA is considered good, most being of calcium bicarbonate type. TDS levels normally vary between 100 and 400 mg/l in the headwaters regions. Higher TDS levels correspond to low flows. Calcite and aragonite are at or near saturation in the streams flowing into Scofield Reservoir, and precipitation of calcium carbonate in the reservoir is indicated by the water chemistry (Waddell and others, 1983a).

Skyline's monitoring station CS-6 is at the same location as USGS gaging station 09310600, near the mouth of Eccles Canyon. Skyline and USGS measurements of TDS are summarized in Table 8 Skyline measured higher concentrations of TDS between 1981 and 2002 than were measured by the USGS between 1980 and 1984. The USGS analyzed samples more frequently than Skyline. TDS concentrations have been increasing from year to year at this location and others along Eccles Creek below the Skyline mines (Figure 6a).

USGS gaging station 09310700, on Mud Creek near the mouth of Winterquarters Canyon and just upstream of the town of Scofield, was operated continuously during water years 1979 through 1984. TDS measurements averaged 315 mg/l with minimum and maximum of 170 and 390 mg/l (Price and Plantz, 1987). Monitoring station VC-1 is approximately 1 mile upstream of

09310700 and just below the White Oak/Belina loadout. At VC-1, average TDS from 1975 to 2002 was 320 mg/l, with a maximum of 730 and a minimum of 156 mg/l.

TABLE 8
Total Dissolved Solids (TDS) in Eccles and Mud Creeks

Gaging Station	Date	Average	Maximum	Minimum
Eccles Creek just above confluence with Mud Creek				
USGS 09310600	1980 - 1984	294 mg/l	492 mg/l	161 mg/l
Skyline CS-6	1981 - 2002	393 mg/l	1282 mg/l	198 mg/l
Mud Creek below White Oak/Belina loadout				
USGS 09310700	1979 - 1984	315 mg/l	390 mg/l	170 mg/l
Belina VC-1	1975 - 2002	320 mg/l	730 mg/l	156 mg/l

There is a shift from calcium toward sulfate and magnesium cations as the water flows toward Scofield Reservoir, probably due to dissolution of evaporites in Mancos Shale tongues exposed in Pleasant Valley (Coastal, 1993, p. 33).

Figures 6 through 8 show TDS concentrations from 1977 to 2002 from data submitted by Skyline and Valley Camp to UDOGM. Linear regressions of TDS concentration as a function of time were calculated, time providing a rough representation of ongoing coal mining activities such as production, storage, and hauling of coal and discharge of water from the mines. Representative linear regressions are plotted on the figures. Data from the initial period of road construction during 1975 and 1976 were not used in the regression calculations because they are not representative of ongoing mine operations. Road improvement and additional construction were ongoing from 1980 to 1984 but there was not a noticeable change in TDS concentrations during this period. Other specific data omitted from regression calculations are indicated on the figures.

In water samples from Eccles and Mud Creeks downstream of the Skyline mines (Figures 6a and 7) there has been a notable increase in TDS since monitoring began. Discharge of these streams also increased moderately over this period of time, so the total weight of dissolved solids carried by these streams grew more than the increase in TDS concentration alone would indicate. The source of the increased TDS and discharge is the Skyline mines.

TDS levels in water discharged from Skyline's sediment pond began exceeding the UPDES maximum of 1000 mg/l (753 mg/l annual average) on a regular basis in November 1990. Sulfate concentrations also exceeded the 500 mg/l UPDES limit in most of these high TDS samples. Leaching of sulfate from rock dust in flooded, abandoned areas of the Skyline mines was the source (ERI, 1992). In May 1994 the Utah Division of Water Quality raised the daily limits to 1600 mg/l TDS and 1000 mg/l sulfate on an interim basis through September 1994, with TDS and sulfate levels to meet requirements of the regular UPDES permit at the end of the interim period.

TDS concentrations in lower Eccles Creek are diluted between CS-2 and VC-9 by inflow from South Fork and Whisky Creek and baseflow from the Star Point-Blackhawk aquifer. Further dilution occurs when Eccles Creek flows into Mud Creek, but still TDS concentrations have increased at VC-1 and VC-2 (Figure 7).

Linear regressions of data for CS-2 and VC-9 are shown on Figure 6a. Regressions for VC-6 and CS-6 are not shown but fall between those for CS-2 and VC-9. Coefficients of determination (r^2) for the regressions are 24% at CS-2 and VC-6 just below the Skyline mines and decrease downstream along Eccles and lower Mud Creeks to 6% at VC-1. This decrease in the coefficients of determination indicates that the correlation between TDS concentrations and mining activity (time) decreases as downstream distance from the mines increases.

TDS concentrations have remained nearly constant at CS-3 and CS-9 above the Skyline mines (Figure 6b). Linear regressions of data from stations CS-11 (Figure 6b) and CS-4 above the Skyline mines and from CS-1 and VC-10 (Figure 6c) in the South Fork of Eccles Creek indicate TDS concentrations have generally increased with time but at a lower rate than in the samples taken downstream of the Skyline mines, CS-1 has actually decreased. These increases may result from airborne dust from the mines and roads. However, coefficients of determination are 20% or less for the regressions of these six data sets (except CS-11, 40%), so at these stations there may be little actual correlation between TDS variations and mining activity.

In Whisky Creek, TDS concentrations have steadily increased at VC-5 below the White Oak/Belina mines from approximately 300 mg/l to close to 1000 mg/l (Figure 6d). The rate of increase is similar to that in lowermost Eccles Creek. Since Whisky Creek accounts for approximately 8% of the flow of the Eccles Creek, this is a minor contribution to the overall balance of the stream. The coefficient of determination of the linear regression is 43%. White Oak/Belina reported 4000 mg/l TDS at VC-5 on June 27, 1986, a singular anomaly possibly caused by road salt getting into the stream (Valley Camp of Utah, 1993). At VC-4 (Figure 6d) above the White Oak/Belina mines, TDS concentrations appear to have remained consistent. TDS values at VC-4 have consistently remained below 200mg/l.

Surface-mining methods should have little impact on the TDS reporting into Eccles Creek. Acid and Toxic-forming testing of the geology in the area was conducted and demonstrated a high neutralizing potential of the sediments and low toxicity. Geologic units containing elevated levels of selenium and metals are to be buried with at least 4 feet of cover and not within the floodplain of Whisky Creek.

TDS in Huntington Creek at UPL-10 above Electric Lake varied from 80 to 442 mg/l and averaged 185.5 mg/l from 1981 to 2002. Figure 8 shows TDS concentrations for stations upstream of Electric Lake. TDS concentrations appear to have changed little with time.

At UPL-3 just below the outlet from Electric Lake, TDS averaged 156.7 mg/l from 1981 to 1991 and ranged from 130 to 210 mg/l (Coastal, 1993, Volume 4). TDS in Huntington Creek at USGS gaging station 09318000 near the town of Huntington was 165 to 345 mg/l between June 1977 and September 1979. TDS in the Price and San Rafael Rivers where they flow into the Green River is 1500 to 4000 mg/l.

Iron and Manganese - Dissolved

From 1979 to 1984, measurements of dissolved iron at USGS gaging station 09310700 in Mud Creek above Scofield ranged from 0.003 to 0.150 mg/l.

Water analyses done for the White Oak/Belina mines have only sporadically included dissolved iron and and only since 1995, included dissolved manganese. The highest value for dissolved iron reported by the White Oak/Belina mines is 6.65 mg/l at VC-13, an abandoned sampling station in Long Canyon. The highest value measured in Whisky Creek below the White Oak/Belina mines at VC-5 was 1.45 mg/l,in October, 1982 . The highest dissolved iron found in Eccles Creek by White Oak/Belina was 0.76 mg/l at VC-6 in August 1980. With the exception of a one-time value of 7.65 mg Iron /l at VC-4 in 1982, VC-4 and VC-5 have had very low dissolved Iron and Manganese values.

Maximum dissolved iron reported by Skyline from surface water between 1980 and 2002 was 0.36 mg/l at CS-2 in Eccles Creek, recorded in 1992. Maximum dissolved manganese was 0.2 mg/l also at CS-2.

Dissolved iron in Huntington Creek at station UPL-10 above Electric Lake varied from 0.03 to 0.16 mg/l and averaged 0.09 mg/l from 1981 to 2002. Dissolved manganese varied from 0.01 to 0.10 mg/l and averaged 0.06 mg/l.

Iron and Manganese - Total

Total iron averaged 2.7 mg/l and total manganese averaged 0.15 mg/l at sites monitored for the White Oak/Belina mines from 1975 through 2002. The highest reported concentration for total iron is 88.5 mg/l, and for total manganese it is 7.15 mg/l. Both samples were from VC-5 on Whisky Creek but were collected at different times. High total iron concentrations have been reported by Skyline at several locations, the highest being 45.10 mg/l at CS-9, above the Skyline mines in the north fork of Eccles Creek. Total manganese concentrations reported by Skyline have ranged from 0.01 to 1.06 mg/l. Price and Plantz (1987) do not report total iron and total manganese concentrations.

Data from CS-6 near the mouth of Eccles Creek show total iron ranged between 0.14 and 24.5 mg/l from 1981 to 2002 and averaged 1.3 mg/l. At monitoring station VC-1 on Mud Creek

just below the White Oak/Belina loadout, average total iron from 1977 to 2002 was 1.11 mg/l. The maximum was 7.66 mg/l and the minimum was 0.015 mg/l.

Total iron in Huntington Creek at station UPL-10 above Electric Lake has varied from 0.09 to 0.72 mg/l and averaged 0.34 mg/l from 1981 to 2002. Total manganese varied from 0.019 to 0.07 mg/l and averaged 0.03 mg/l. At UPL-3, just below Electric Lake, total iron averaged 0.2 mg/l from 1981 to 1991 and ranged from 0 to 1 mg/l. Total manganese was below detection limits (Coastal, 1993, Volume 4).

Nickel

The Skyline Mine PHC states (PHCA-27) that nickel concentrations have reached as high as 40 ug/l. This level is greater than the 15 ug/l known to inhibit the reproductive capabilities of Ceriodaphnia dubia, an invertebrate biologic indicator species, but below the chronic and acute criteria, for both aquatic wildlife and human health, in the Standards of Quality for Waters of the State. As the flows increased from 1999 through 2001, there initially were indications of toxicity from high nickel concentrations and high TDS. The significant inflow to the mine from the 10-Left area and changes of how water is handled underground resulted in a decline in TDS and dissolved nickel over time.

The source of this nickel is not identified. Nickel is not typically found in the Wasatch Plateau, neither is it commonly associated with the other atypical metals - copper, lead, and zinc - that are sometimes detected in water and sediment samples from the Eccles and Mud Creek drainages. Monitoring results from ongoing sampling will be checked to see if Nickel values rise in the future. The mine has been working with the Utah Division of Water Quality to track this possible issue.

Other Metals

Trace metals were below U. S. EPA maximum contaminant levels (MCL) in water samples collected from Mud and Eccles Creeks in 1979 through 1980 (Waddell and others, 1983b). Simons, Li, and Associates (1984) found the water at USGS gaging station 09318000, on Huntington Creek near the town of Huntington, met EPA drinking water standards.

Surface water quality data in the Skyline MRP show metal concentrations have generally met Utah Division of Water Quality criteria for class 1C, 2B, 3A, and 4 waters. (Utah Division of Water Quality water quality standards were revised February 16, 1994 and standards are now based on dissolved metal concentrations instead of acid-soluble metal concentrations.) Dissolved selenium in water discharged from the Utah #2 Mine and monitored at VC-3 and VC-3a from 1973 to 1978 frequently exceeded the current Class 1C water quality standard of 0.01 mg/l and exceeded the Class 4 standard of 0.05 mg/l several times (Valley Camp, 1993, Appendix 722.100a).

There are no applicable standards for total metals in water, but what appear to be elevated concentrations of total copper (0.03 mg/l up to 24.5 mg/l) were found between 1981 and 1991 in samples from most of Skyline's sampling stations, including CS-7 and CS-10 in upper

Huntington Canyon. High total lead (up to 0.74 mg/l) and total zinc (up to 0.062 mg/l) also were found in several samples (Coastal, 1993, Volume 4). Data from the White Oak/Belina mines contain several analyses with similarly high total lead, copper, and zinc concentrations. The igneous dikes may be the source of these metals.

pH

The range of the average pH of surface water in the Mud Creek and Huntington Creek basins is 7.2 to 8.0 based on measurements at numerous locations. Extremes of 6.0 to 9.2 have been reported. Where both acidity and alkalinity have been determined, alkalinity is typically at least 25 times acidity.

Solids

The estimated annual sediment yield of the Skyline permit area is approximately 0.44 acre-feet per square mile, which would indicate total annual yield to the Price River is 1.25 acre-feet and to the San Rafael River it is 3.07 acre-feet. The majority of this is suspended sediment, with only a small percentage carried as bed load (Coastal, 1993, p. PHC3-2). Using the same estimated yield of 0.44 acre-feet per square mile for the White Oak/Belina permit area, approximate total annual yield to the San Rafael drainage is 0.5 acre-feet and to the Price River drainage is 1.7 acre-feet.

Total suspended solids (TSS) measured at CS-3 and CS-11 in the headwaters of Eccles Creek averages 17 and 49 mg/l. Average TSS is 92mg/l at station CS-6 on Eccles Creek just above the confluence with Mud Creek. The maximum TSS at this location has been 3190 mg/l and the minimum 1.4 mg/l. TSS averages 103 mg/l at VC-9 at the confluence with Mud Creek. The average TSS at VC-5 on Whisky Creek has been 454 mg/l and the minimum 1.0 mg/l.

Annual average TSS at VC-1 on Mud Creek below the White Oak/Belina loadout is 183 mg/l.

Total suspended solids in Huntington Creek at station UPL-10 above Electric Lake have varied from 1 to 41 mg/l, and averaged 5.5 mg/l from 1981 to 2002. Suspended sediment loads reported by the USGS for undisturbed areas of the Huntington Creek drainage are typically less than 100 mg/l at low flow but during high flows can be between 500 mg/l and 1000 mg/l. In lower Huntington Creek, suspended sediment loads in excess of 10,000 mg/l can be expected from thunderstorms, and major floods could produce even higher levels. Construction, mining, and traffic on unpaved roads have produced increases in suspended sediment load in streams but these are minor, temporary conditions that have not been quantified (Simons, Li, and Associates, 1984, p. 2.33).

The naturally reproducing population of cutthroat trout in Eccles Creek was virtually eliminated from Eccles Creek between 1975 and 1983 as road and mine construction increased the sediment load in the stream. Up to 18 inches of fine sediment had accumulated over the natural substrate. Habitat improvement initiated in 1981 resulted in significant recovery of the

trout population, 93% of pre-disturbance levels by 1986 (Donaldson and Dalton, Utah Division of Wildlife Resources in Appendix Volume A-3, Coastal States, 1993).

Landslides occurred at approximately 1500 locations in the Wasatch Plateau during the 1983-1984 water year due to higher than average precipitation. One of these slides occurred in the North Fork of Eccles Canyon where the creek is normally diverted beneath Skyline's topsoil stockpile. Debris blocked the entry to the diversion, water overtopped the stockpile, and mud and other debris were flushed into Eccles Creek. TSS was measured at up to 9800 mg/l in Eccles Creek by UDOGM personnel. During this same period mud was flowing into Whisky Creek from the unpaved road to the White Oak/Belina mines. TSS levels were not documented in Whisky Creek but the deterioration of water quality from suspended solids was visibly evident to UDOGM personnel who investigated.

In 1987 a tunnel was advanced through an igneous dike in the Skyline #3 Mine. A dark mica mineral, phlogopite, was carried from this tunnel to the sedimentation pond by the mine discharge water. The phlogopite did not settle-out in the pond and was discharged into Eccles Creek, where it was entrapped by algae. The phlogopite and algae, along with bacteria and mold, produced a marked discoloration of stream substrate, described as "slime", as far as the White Oak/Belina loadout on Mud Creek. The fine sediment did not seem to be having any direct effect on the fish in July 1987, but macroinvertebrates were substantially fewer in number and less diverse in Eccles Creek below the mine in comparison to Eccles Creek above the mine, to South Fork, and to Mud Creek. Elevated concentrations of nitrite, nitrate, and phosphate were found in water below the mine and coliform bacteria in the sediment pond were elevated (UDWR, 1987).

The suspended phlogopite problem was solved by rerouting underground drainage around the dike and adding a flocculent to the sedimentation pond, but the slime was still in the streambed in late 1988 when sudsing was observed in Eccles Creek. Further water analyses found a surfactant in addition to continuing high levels of nitrogen and phosphorus. The source of the phlogopite was unrelated to that of these nutrients (see discussion below).

A survey of Eccles Creek in August and October 1989 by the Utah Division of Wildlife Resources (UDWR) found coal fines were accumulating behind beaver dams, particularly in the stretch downstream of the Skyline mines to the confluence with South Fork. Entrapment of the coal in the ponds was causing a loss of trout habitat in upper Eccles Creek, but it was also having a positive effect by preventing migration of the fines downstream to lower Eccles Creek, Mud Creek, and Scofield Reservoir. Fish were almost absent from Eccles Creek at the South Fork confluence, but downstream numbers of fish increased and young fish were evidence of successful spawning. In addition to coal fines, gravel chips from the highway had completely covered the substrate in places (Report dated June 26, 1990 by UDWR in Appendix Volume A-3, Coastal States, 1993).

Studies of macroinvertebrates and sediment in Eccles Creek done for Skyline by Ecosystems Research Institute (ERI, 1992) found mean number of individuals, total number of taxa, and aquatic plant biomass decreased immediately below the mine and then increased downstream. Water below the mine was not acutely toxic, but the effects of chronic toxicity and

sediment transport were not determined. The streambed immediately below the Skyline mines was extremely embedded and 0.5 mm to 2 mm diameter particles made up approximately 15% to 25% of the sediment, compared to 5% to 10% in other reaches of the stream.

Winget (1980) noted that sheep and cattle grazing, recreation, unpaved roads, mines, and fires had all contributed to previous degradation and erosion of these watersheds. The results were increased sedimentation and reduction or loss of fish and invertebrate populations. Improved range management along Huntington Creek in the late 1970's allowed some recovery of riparian habitat and bank stability.

Nitrogen and Phosphorus

Wadell (1983a) concluded that Scofield Reservoir may become highly eutrophic unless measures are taken to limit the inflow of nutrients. Winget (1980) attributed nutrient input to Scofield Reservoir to recreation, cattle and sheep grazing, and domestic sources. Wadell's study during the 1979 and 1980 water years found that Mud Creek was providing 16% of the inflow to the reservoir but 22% of the total nitrogen and 24% of the total phosphorus. Wadell attributed elevated nutrient levels in 1979 and 1980 to the clearing of 27 acres of forested land for fire prevention around the Skyline mine portals and roads in 1979.

Fish accounts for 52 % and Mud Creeks accounts for 29 % of the nutrient input to Scofield Reservoir, so Mud Creek contributes a disproportionately high amount of the nutrients. Total phosphorus in particular has been directly correlated with sediment load, and phosphorous loads in Scofield Reservoir have been directly attributed to the erosion and transport of soils during spring runoff. Peaks in nitrate and phosphate during spring runoff have been measured in Mud Creek (Clyde and others, 1981).

Mud Creek drainage has nutrient-rich soils and increased flows from the mine will increase the nutrient load of the reservoir. Importantly, the increased flow due to pumping from the Skyline Mine increases the water in Scofield Reservoir well above the natural runoff, so the impact of the increased nutrient load might be offset by this additional flow, or the total nutrient load might even be diluted.

Inflows to Skyline Mine have been pumped into Eccles Creek since 1983. Since March 1999 inflows to Skyline Mine were pumped to abandoned underground workings and pumped to Eccles Creek. While there are estimates of the amounts, the actual quantities pumped to Eccles Creek are unknown. Discharges have been recorded since August 16, 2001, and from then through November 1, 2002, have varied from 4,500 gpm to 10,500 gpm, with an average of about 8,000 gpm. The volume of water pumped as of November 1, 2002, is 15,572 Acre-feet to Eccles Creek, Mud Creek, and Scofield Reservoir. This has increased the flow in Eccles Creek to about 10 times the average annual amount and increased flow in Mud Creek to about 3 times the average annual amount. Flows are still only about 20% of spring runoff rates. Pumping is expected to decline to about 2,900 gpm in December 2004, but continue at that rate for another 5 years.

TSS and flow at sample locations C6 on Eccles Creek, VC9 on Mud Creek and VC1 on Mud Creek show the average sediment yield carried by Eccles and Mud Creek prior to 1999 was 2,710 Tons/yr. The average sediment yield carried by Eccles and Mud Creek between 1999 and 2002 has been 2,908 Tons/yr, which is an increase of 7% annually.

Five new monitoring sites were added to Mud Creek and two on Eccles Creek to determine if the significantly increased mine discharge flows are having a negative impact on Mud Creek and Scofield Reservoir. These sites will be monitored for total flow, TDS, TDS, and total phosphorous and for changes to stream morphology.

There is no water quality standard for nitrite, but concentrations in excess of 0.06 mg/l produce mortality in cutthroat trout (UDWR, 1988). Nitrate should not exceed 10 mg/l in Class 1C water, and levels above 4 mg/l are considered an indicator of pollution, usually from sewage. Levels of phosphate in excess of 0.04 mg/l are not toxic to trout but are excessive and promote eutrophication (UDWR, 1988). By state standards for Class 1C, 2A, 3A, and 3B waters, phosphate in excess of 0.05 mg/l is a pollution indicator. The following discussion also refers to MBAS, a detergent or surfactant. The recommended limit for MBAS concentration is 0.2 mg/l (Steve McNeil, Utah Dept. of Health, personal communication in UDOGM, 1988).

At station UPL-10 on Huntington Creek above Electric Lake, total nitrogen averaged 0.38 mg/l from 1981 to 2002, with highs of 1.0 mg/l ammonia and 0.68 mg/l nitrate and lows of 0.01 mg/l for both. Total phosphate averaged 0.42 mg/l with a high of 6 and a low of 0.02 mg/l. At UPL-3 just below Electric Lake, total nitrogen averaged 0.6 mg/l from 1981 to 1991, with highs of 1 mg/l as ammonia and 2 mg/l as nitrate and lows of 0 mg/l for both. Total phosphate averaged 0.2 mg/l with a high of 2 and a low of 0 mg/l (Coastal, 1993).

Data collected by Winget (1980) from 1976 to 1978 indicated that phosphate in Electric Lake was below the minimum concentration needed by aquatic life, and nitrate was just above the limit. These nutrient concentrations reflected the clean nature of the streams feeding the reservoir. Eccles Creek had nitrate concentration adequate for algal growth at most times, but low phosphate.

Discharge weighted average concentrations for nitrogen and phosphorus at Station S-29 in Eccles Canyon (same as USGS gaging station 09310600 and Skyline's station CS-6) during water years 1979-1980 were 11 and 2.2 mg/l. Concentrations of suspended and dissolved nitrogen combined reached 21 mg/l in May, 1980, and phosphorus reached 4.3 mg/l. These nutrient levels apparently resulted from the clearing of 27 acres of forested land for fire prevention around the Skyline mine portals and roads in 1979 (Wadell, 1983a). In Mud Creek downstream of the confluence with Eccles Creek, at S-36 (near Winterquarters Canyon and USGS gaging station 09310700), discharge weighted average concentrations were 1.3 mg/l nitrogen and 0.1 mg/l phosphorus. The downstream decrease is attributed to the nutrients from Eccles Creek being mostly in suspended form that settles out in the slower flow of Mud Creek. About 50% of the nitrogen and 25% of the phosphorus in Mud Creek in 1980 came from Eccles Creek, but only 20% of the flow. Concentrations of nutrients in Mud Creek peaked at about the

same time as those in Eccles Creek. (Waddell and others, 1983a; Waddell and others, 1983b, p. 36).

At Skyline's monitoring station CS-6 on Eccles Creek, between 1981 and 2002, total nitrogen averaged 0.6 mg/l and phosphate averaged 0.14 mg/l. Highs and lows for nitrogen were 2.5 and 0.01 mg/l nitrate and 3.5 and 0.01 mg/l ammonia; for phosphate they were 0.76 and 0.01 mg/l. Data from 1976 to 1979 from several stations along Eccles Creek indicate a high for nitrate of 2.70 mg/l and for phosphate of 0.22 mg/l (Vaughn Hansen Associates, 1979). High, low, and mean nitrate concentrations at VC-1 were 0.38 mg/l, 0.01 mg/l, and 0.07 mg/l between 1975 and 2002, but analyses for nitrates have been infrequent since 1988. Maximum phosphate was 4.55 mg/l in June 1984 and minimum was 0.01 mg/l in September 1987. No phosphate analyses have been done at VC-1 since 1999.

In 1987 a dark mica mineral, phlogopite, was being discharged from Skyline Mine #3 into Eccles Creek by way of the sediment pond (discussed above). The phlogopite was entrapped in algae, which combined with bacteria and fungi to produce a slime on the stream substrate as far as the White Oak/Belina loadout on Mud Creek. The fine sediment did not seem to be having any direct effect on the fish in July 1987, but macroinvertebrates were substantially fewer in number and less diverse in Eccles Creek below the mine in comparison to Eccles Creek above the mine, South Fork, and Mud Creek. Analyses of water samples taken by UDWR (Table 9) found 0.46 mg/l total nitrogen in the stream below the Skyline mines, 0.11 mg/l nitrite (24% of total nitrogen) and 0.34 mg/l nitrate (76% of total nitrogen). Total nitrogen above the mines was 0.29 mg/l, with no nitrite. Phosphate levels in the Skyline sediment pond and Eccles Creek were 0.045 mg/l but no phosphate was detected above the mine. UDWR subsequently found elevated total and fecal coliform bacteria in the sediment pond. Because of the bacteria and nitrites, UDWR suspected the sewage tank was backing up into manhole connections and leaking into the sediment pond. UDWR recommended chlorination of the sediment pond and procedures to avoid recurrence of the suspected sewage backup (UDWR, 1987).

TABLE 9

	Nitrite	Nitrate	Ammonia	Organic Nitrogen	Phosphorus Total	MBAS Detergent
Sampled by UDWR July 1987 (UDWR, 1987)						
Above Skyline Mines	not detected	0.29	**	**	not detected	**
Below Skyline Mines	0.11	0.34	**	**	0.045	**

** Analysis not reported, probably not done

Phlogopite was eliminated from the pond discharge by rerouting flow in the mine and using a flocculent, and UDWR recommendations for reducing pollution from sewage were implemented, but slime persisted in the streambed through the summer of 1988. Random checks by UDWR indicated water quality was acceptable. Fish were abundant and macroinvertebrate populations appeared normal in lower Eccles Creek. In late September foaming was observed in Eccles and Mud Creeks along the same reaches where the slime was found. The slime appeared to be growing and extending deeper into the substrate. UDOGM personnel took samples of Eccles Creek above and below the mines in September 1988, and in October at several locations within the 72 inch bypass, including the discharge of the sedimentation pond (Table 10). Analysis of these samples revealed high nitrite levels persisted. In September, nitrite concentration was 0.64 mg/l in the outfall of the 72-inch culvert, which carries drainage from undisturbed drainages beneath the disturbed area and also receives the discharge from the sedimentation pond. Ammonia and organic nitrogen concentrations were also elevated in comparison to undisturbed drainages (UDOGM, 1988). Samples taken from the pond outfall by UDWR in October 1988 had 14 mg/l nitrate and 0.09 mg/l nitrite (UDWR, 1988). Results of analyses from several different sources during September and October are summarized in Table 10.

Total phosphate was 0.50 mg/l in one sample taken by Skyline from the discharge from the shop (Utah Fuel Company, 1988). Another sample from the shop sump reportedly approached 13 mg/l (Keith Zobell, personal communication, in UDOGM, 1988). Samples taken from the sedimentation pond by UDWR personnel in July and October 1988 had phosphate levels of 0.045 mg/l and 0.06 mg/l (UDWR, 1988). Water analyses also detected a detergent, MBAS, in the sediment pond and the outfall (Table 10)

In addition to the laboratory analyses, Skyline used a field kit to check nitrate levels at various times and locations. On October 5, 1988 nitrate levels were 8 to 9 ppm in Eccles Creek below the mine and 13 ppm in the discharge from the #3 Mine. Other flows into the sediment pond showed no nitrate, indicating the sewage holding tanks were not the source of the nitrate. On October 6, water coming off the longwall section of #3 Mine had 5 ppm nitrate, return water had 3 ppm, and overflow from the emulsion pump had 2 ppm. Water from mined out areas had no nitrate (Utah Fuel Company, 1988).

Trout and invertebrates had not been checked in upper Eccles Creek in mid-September 1988 when lower Eccles Creek was monitored because lower Eccles Creek was supporting healthy populations even with the slime present. However, an intensive sampling of fish and macroinvertebrate populations in early October 1988 revealed that the trout population and biomass in upper Eccles Creek had declined over 90%. Macroinvertebrates were essentially gone in upper Eccles Creek downstream from the sediment pond outfall, but taxa and numbers increased downstream, as did numbers and biomass of fish. High concentrations of nutrients were producing both toxic and eutrophic conditions. Nitrite in the water was a contributing and probably primary cause of mortality of macroinvertebrates in upper Eccles Creek and had forced trout to migrate downstream to where dilution produced a tolerable habitat. Trout spawning had not been successful in 1987 and 1988 in any section of the stream: either the slime precluded successful spawning, the nitrites were fatal to the eggs and fry, or both (UDWR, 1988). Refer to the section Fish and Invertebrates for more information.

TABLE 10

	Nitrite	Nitrate	Ammonia	Organic Nitrogen	Phosphorus Total	MBAS Detergent
Sampled by UDWR July 1988 (UDWR, 1988)						
Sed Pond Effluent	**	**	**	**	0.045	**
Sampled by UDOGM 28 September, 1988						
North Fork	<0.05	1.20	<0.05	<1.00	<0.05	<0.03
Middle Fork	<0.05	0.59	<0.05	<1.00	<0.05	<0.03
South Fork	<0.05	0.21	<0.05	<1.00	<0.05	<0.03
72" Bypass Outfall	0.64	0.38	0.19	1.30	<0.05	0.28
Sampled by UDOGM 03 October, 1988						
Sed Pond at 3'	*	0.26	0.14	*	<0.05	0.75
Sed Pond at 6'	*	0.37	0.14	*	<0.05	0.50
Sed Pond at 9'	*	0.32	0.14	*	<0.05	0.83
Sed Pond at 10.5'	*	0.3	0.16	*	<0.05	*
72" Bypass Outfall	*	0.33	0.25	*	<0.05	*
Pond Spillway in Bypass	*	0.41	0.18	*	<0.05	0.80
Middle and South Fork Confluence in Bypass	*	0.25	*	*	<0.05	0.1
28" Pipe in Bypass	*	*	*	*	<0.05	0.09
Sampled by UDWR October 1988 (UDWR, 1988)						
Sed Pond Effluent	0.09	14.0	**	**	0.06	**
Sampled by Skyline October 1988 (Utah Fuel Company, 1988)						
Eccles Creek	**	**	**	**	0.04	***0.90
Mine #3 Discharge	0.08	2.28	**	**	0.04	***0.87
Sed Pond Discharge	0.04	3.39	**	**	0.06 and 0.04	***1.33
Shop Discharge	0.03	3.18	**	**	0.50 and 0.36	***1.33

* Analysis not done
** Analysis not reported, probably not done
*** Unspecified surfactant, not identified as MBAS

Elevated nitrites were traced to an emulsion oil used in the longwall system in the #3 mine. In a 1:20 dilution that was used, nitrite concentration was 182 mg/l and nitrate was 872 mg/l. As much as 4000 gallons of this emulsion was released each time the longwall unit was moved, which had occurred six times from 1986 to 1988. There were also occasional spills and leaks. The oil was captured and removed from the water by skimming and flocculation before it left the mine, but the nitrogen compounds went into solution in the water and passed through the sediment pond into Eccles Creek. Skyline replaced the emulsion oil with one that contained no nitrites or nitrates. Field kit test results submitted to UDOGM by Skyline in late 1988 indicated nitrate and nitrite levels were dropping in discharges from Mine #3 and the sediment pond (Utah Fuel Company, 1988). Samples taken by UDOGM in December 1988 (Table 11) detected no nitrite or nitrate in discharges from the #3 Mine and the pond, but elevated levels were found in the discharge from the #1 Mine. Field kit results from January to May 1989 showed consistent nitrite and nitrate levels, 0.03 mg/l and 1.07 mg/l respectively, in both the sediment pond and the Mine #3 discharge. In 1989 the longwall unit was moved from Mine #3 to Mine #1. Nitrate and nitrite were within acceptable limits by August 1989 (Table 11).

Sudsing and elevated phosphate turned out to be unrelated to the nitrogen compounds but rather were caused by detergents used for cleaning equipment in the shop and in mop water used to clean the floors. The mop water was being disposed of into floor drains, which empty into the 72 inch bypass culvert by way of the sedimentation pond. The problem has been solved by replacing detergents used in both applications with low sudsing, non-phosphate types and revising procedures so that mop water is now discarded into the sanitary sewer (Utah Fuel Company, 1988).

TABLE 11

	Nitrite				Nitrate			
Sampled by UDOGM	12/14/88	3/29/89	4/18/89	8/31/89	12/14/88	3/29/89	4/18/89	8/31/89
Mine #1 Discharge	0.83	?	*	0.05	5.2	0.034	*	0.075
Mine #3 Discharge	<0.05	0.013	0.14	*	<0.05	0.039	2.0	*
Pond Discharge	<0.05	0.032	0.24	<0.05	<0.05	0.033	1.76	1.48
72" Bypass Outfall	*	*	<0.05	<0.05	*	*	<0.05	1.11

* Analysis not done

Oil and Grease

There is no water quality standard for oil and grease, but the UPDES permit limit for both the White Oak/Belina and Skyline mines is 10 mg/l. A 10 mg/l oil and grease limit does not protect fish and benthic organisms from soluble oils such as those used in longwall hydraulic systems, and UDWR has recommended soluble oils be limited to 1 mg/l (Darrell H. Nish, Acting Director UDWR, letter dated April 17, 1989 to Dianne R. Nielsen, Director UDOGM).

Oil and grease in water discharged from Skyline Mine #1 (CS-14) averaged 2.7 mg/l from 1989 to 2002, and 23.4 mg/l was the maximum, in June of 1993. At Mine #3 (CS-12), data from 1983 to 2002 show 1.5 mg/l was the average. The maximum of 12.5 mg/l was recorded in 1987. Discharge from the sediment pond has occasionally exceeded the 10 mg/l limit in the UPDES permit.

The principal source of oil in water discharged from Mine #3 appears to be the longwall unit that was installed in 1986. A water-oil emulsion (5% oil) is used in the longwall hydraulic system to meet MSHA fire protection requirements. As much as 4000 gallons of this emulsion can be released each time the longwall unit is moved. The unit was moved six times between 1986 and October 1988. There are also occasional spills and leaks. Oil is captured and removed from the mine water discharge system by skimming and flocculation before it leaves the mine. Since 1988 an extensive no-spill program has been part of the longwall operations, and if a spill does occur the water and oil emulsion is to be pumped into abandoned sections of the mine rather than being discharged to the surface (Utah Fuel Company, 1988). If there is flocculated oil in the sludge in the sediment pond, it is a potential source of recontamination that will eventually require proper removal and disposal.

Prior to 1985, oil and grease in water discharged from the White Oak/Belina mines was generally less than 0.5 mg/l, with a maximum of 2.2 mg/l. Between September 1985 and June 1989, measurements exceeding 0.5 mg/l increased, with the February 21, 1986 sample exceeding 10 mg/l. Longwall mining equipment is not used in the White Oak/Belina mines. Reasons for the increase in oil and grease in the mine discharge have not been identified.

Temperature

Water temperatures in the streams fluctuate greatly because low flows and turbulence act to quickly equilibrate water temperatures with air temperatures. Winget (1980) found daily fluctuations of 12 to 15 degrees C during warmer months, but fairly constant temperatures of 0 to 2 degrees C during November to March. UDOGM found that the temperature of Eccles Creek increased significantly, 43 degrees to 54 degrees, as it passed through the 72 inch bypass culvert and received the sediment pond discharge (UDOGM, 1988). The maximum allowable change for Class 3A waters is 2 degrees C (3.6 degrees F).

Fish and Invertebrates

James Creek

The Skyline Mine MRP (page 2-71) commits to conducting macroinvertebrate studies and fish studies in James Creek for 2 years beginning in October 2001 and then every three years thereafter. An October 2000 study has already been conducted. Sampling should identify any slow degradation of the creek due to sedimentation. Unfortunately, only one year of baseline data was obtained prior to mining activities. Mt. Nebo Scientific, Inc. collected the data for the first two years, and Dr. Dennis Shiozawa conducted the surveys. The October 17, 2000 and 2001 (2001 Annual Report) reports found James Creek to be in excellent condition despite the large decrease in macroinvertebrate and fish numbers, Table 12 summarizes the sampling.

TABLE 12. Summary of Aquatic Resource Sampling on James Creek in 2000 and 2001.

Date	Macroinvertebrate #/m^2	Biomass (g/m^2)	Total Fish
Fall 2000	378,510*	272	587
Spring 2001**	335,000		
Fall 2001	127,875	256	93

*Used summary data from Fall 2001 report, because Fall 2000 report indicates 34,757/m^2.
** Spring 2001 report not found; used summary data from Fall 2001 report.

The 2001 report provides several explanations for the decrease in macroinvertebrate and fish numbers and cannot directly attribute the decrease to mining activities. The large amount of drilling fluids that spilled into James Canyon was not mentioned or accounted for in this study. However, a subsequent conversation between Susan White of the Division and Dr. Shiozawa indicated that the drilling fluids could have influenced the fish numbers. At the time of the spill the James Canyon wells were permitted under an exploration permit administered by the BLM.

Because of the lack of adequate baseline data and the dramatic decrease in numbers of macros and fish for Fall 2001 these baseline studies should continue. Mitigation will likely be required.

Upper Huntington and Eccles Creeks have naturally reproducing populations of cutthroat trout. Rainbow and brown trout were reported in upper Huntington Creek prior to 1979, but UDWR's work to eliminate these trout species from this fishery has apparently been successful. Rainbow trout have been planted in Scofield Reservoir, and cutthroat are recruited from inflowing streams. Speckled dace, mountain suckers, and mottled sculpin are also found in area streams. Macroinvertebrate communities in both drainages have considerable species diversity (Winget, 1980).

Eccles Creek

UDWR ranks Eccles Creek as a valuable trout stream, mainly as a spawning stream for wild cutthroat trout that are eventually harvested in Scofield Reservoir. Data collected in 1971 by the UDWR, prior to coal development, identified Eccles Creek as a somewhat pristine fishery. The stream sustained an estimated resident population of 1272 wild cutthroat trout along 2.5 miles of habitable stream. Adult trout comprised only 4% of this population (Donaldson and Dalton).

Benthic invertebrate studies were done by the USGS at three sites on Mud Creek and two in Eccles Canyon in July and September 1979, and July and October 1980. There were consistent downstream and seasonal trends. Diversity decreased downstream in Eccles Canyon, probably because Skyline mine was relocating the stream at the time (Waddell and others, 1983b).

Winget (1980) collected data on invertebrates and sediments in Eccles and Huntington Creeks prior to construction of the Skyline Mines. Skyline studied benthic communities and sediment composition of gravel beds in Eccles Creek from 1979 to 1985. Fishery habitat studies were also done (Coastal, 1993, p. 2-70).

In conjunction with the Skyline study, UDWR conducted fish surveys the first week of August from 1979 to 1986 (Donaldson and Dalton). UDWR found that the fishery began to decline after 1975 in the 1.75 mile stretch of Eccles Creek below the Belina Mines turnoff. Construction of roads and mines caused high sedimentation in the stream, up to 18 inches of fine sediment above the natural substrate. In 1979 the fish population along the entire 2.5 miles of habitable stream was down to 40% of 1971 pre-mining levels, and 18% of the fish were adults compared to 4% in 1971. Construction for the Skyline mines began in 1980. Mitigation started in 1981 but deterioration of the stream continued. By 1983 most of the road through Eccles Canyon was asphalted and disturbed areas were revegetating, but only 27 fish were found in Eccles Creek, a 98% reduction compared to 1971. There were no young-of-year or 1-year juveniles. A reduction of sedimentation was evident by 1985, and by 1986 the cutthroat population had recovered to 93% of the 1971 levels and 1-year juveniles were present (Donaldson and Dalton).

The UDWR conducted fish surveys and macroinvertebrate inventories in 1988 as part of the investigation of the problems with foam and slime in Eccles Creek (discussed above). Fish population had been estimated in 1986 to be 600 fish /mile. In mid September 1988, fish in lower Eccles Creek were abundant and macroinvertebrate populations appeared normal. However, when Upper Eccles Creek was assessed in October 1988, only 20 fish/mile were found. It was also found that one and two-year old fish were absent from the population. Macroinvertebrate diversity dropped from 6 - 7 families /square foot above the Skyline mines to 1 family present below the mines. Diversity in Mud Creek was 8. Toxicity from nitrites and eutrophication from nitrates and phosphates were the causes of these population losses (UDWR, 1988; UDOGM, 1988).

Studies of macroinvertebrates and sediment in Eccles Creek were done for Skyline by R. W. Baumann (1985) and Ecosystems Research Institute (ERI, 1992). Benthic invertebrates in the stream below the mines indicated stress in the 1984 - 1985 surveys but showed recovery from the conditions that existed in 1981. In 1991, mean number of individuals, total number of taxa, and aquatic plant biomass decreased immediately below the mine and then increased downstream. The zone of impact appeared to extend to the confluence of Eccles Creek with Mud Creek, but at the confluence parameters were similar to those in Mud Creek. It was determined the water below the mine was not acutely toxic, but the effects of chronic toxicity and sediment transport were not determined. The streambed immediately below the mine was extremely embedded and the percentage of sediment 0.5 to 2 mm in size was significantly larger than elsewhere in the streams. Electrical conductivity of the water was highest below the mine and decreased downstream. Sulfate leached from rock dust in flooded, abandoned areas of the mine has been identified as the reason TDS levels in mine water discharges were exceeding UPDES standards.

Upper Huntington Creek

After the spillway gates of Electric Lake were closed in 1973 and the reservoir began to fill, UDWR measured increasing numbers of cutthroat trout in Huntington Creek above the lake. Numbers increased from 104 fish per 0.1 mile in 1974 to 263 fish per 0.1 mile in 1977. Also, smaller fish made up increasing percentages of this population, indicating increased reproduction, resident fish, and increasing recruitment stock for the reservoir (Winget, 1980).

Benthic invertebrate studies were done by the USGS at seven sites in Huntington Creek from 1977 through 1979. Diversity indices had a large variability that was attributed to variations, possibly natural, in water quality and stream environment. Simons, Li, and Associates (1984) concluded several more years data would be required to establish baseline conditions.

Winter Quarters Creek

Winter Quarters Creek was surveyed by UDWR in 1968 and 1971. In 1968, 70 cutthroat trout were found along a 0.1 mile reach, with a maximum size of 14 inches. Winget (1980) does not report the numbers for 1971, but maximum size was 9 inches and the presence of young fish indicated successful spawning. Banks were stable along 70% of the stream. Spawning gravels composed 38-42% of the substrate but low flows limited fish production. Caddisflies, stoneflies, and mayflies were common and water quality was high (Winget, 1980). Additional work will be done in 2003 for further classification of the stream. This information will be collected prior to longwall mining occurs beneath the stream.

Stream Channel Alteration, Alluvial Valley Floor, and Land Use

The Division's March 1984 Technical Analysis written for the Valley Camp Mine (now the White Oak Mine) provides a summation of the history of the alluvial valley floor determination. The Division stated that Whisky Canyon and Pleasant Valley above the Utah No. 2 facilities (White Oak Load Out) were observed by the Office of Surface Mining in August of

1983 to be too narrow for flood irrigation or subirrigation agricultural activities. Also in 1984, it was noted that the pastures are flood irrigated and the grasses on the valley bottom may be subirrigated. In the Valley Camp MRP, Map R645-301-411.100 Premining Land Use Map shows the land use down stream of the Belina Mine Complex. Shown on this map, are two pastures along Mud Creek in Pleasant valley below the Utah No. 2 (White Oak Load Out).

Since August 2001, Skyline Mine has been discharging an average of 8,000gpm (17.8cfs) into Eccles Creek. These waters flow down Eccles Creek and then to Mud Creek. Mud Creek flows through Pleasant Valley, an alluvial valley floor.

The historical record of flow in Mud Creek is graphed in Figure 2.12.C of the Skyline Mine MRP, as recorded at the USGS station just downstream of the confluence with Winter Quarter's Creek. Ordinarily, high flows of approximately 100 – 150 cfs occur for a short duration during the months of May and June. Flows quickly subside after snow melt back to the baseline flow of approximately 6 – 12 cfs. The highest daily mean flow during the period from 1974 – 2002 was 384 cfs during the month of May 1984. The lowest daily mean flow was 1.6 cfs during January 1980. The mine discharge is constantly contributing additional water to the baseline flow. Mine water discharge will decline over the next two years to approximately 2,900 gpm (5cfs) (Appendix F of the October 2002 Addendum to the Skyline Mine PHC).

Measurements of flows taken on November 26, 2001 (Appendix D, Skyline Mine MRP) recorded 18.4 cfs in Mud creek after the confluence with Eccles Creek and 24.44 cfs after the confluence with Winter Quarters Creek. The gain in flow downstream is attributed to contributions from springs and side streams (2 – 3 cfs) and re-emerging base flow from the alluvium of 3 – 4 cfs (Section 2.12 and Appendix D July 2002 Addendum to the Skyline Mine PHC).

The mine waters being discharged had an average Total Dissolved Solids (TDS) level of 600 mg/L in July of 2000. With continued pumping, the concentration of TDS has decreased to less than 400 mg/L as of March 2002. Above the mine, the average concentration of TDS is 300 mg/L (July 2002 Addendum to the PHC).

Cross sections of the Mud Creek channel were measured at six different stations. The piezometric surface was measured at four of those stations. At Station 7300, in the vicinity of Green Canyon, the groundwater is four feet below the surface. In the area of Station 14480, the groundwater level is eight feet below the surface, reflecting the rolling nature of the land and the incised nature of the stream channel. The ground water rises back up to four feet below the surface at Station 17340. Station 17340 is located at the site of an irrigation diversion, so as a result, the depth to groundwater at a point 400 feet distant from the stream is closer to the surface than that along the stream channel. This is due to irrigation return flow as well as stream channel entrenchment. (Section 2.12 of the Skyline Mine MRP)

Four landowners own Land along Mud Creek. The land is used for grazing. Ray Jensen, Range Specialist for the Bureau of Land Management (BLM) describes the area as sub-irrigated, grazed land with an historical yield of 4000-6000 pounds/acre. The predominant vegetation type is grass. The number of animals grazed on the pastures by each landowner is variable with time.

Canyon Fuel Company has evaluated the value of the pasture ground in terms of the replacement cost for feed. At a consumption rate of 0.5 Tons/mo and a cost of $100/Ton hay, the replacement cost is $50/animal/month. The replacement of feed is not likely, however, since grazing will not be impeded by high flows along Mud Creek and the reduction in available grazing area is limited to stream banks eroded by the high water.

Mud Creek stream channel vegetation was assessed in December 2001 by Dr. Patrick Collins of Mt. Nebo Scientific (Appendix A of Appendix D July 2002 Addendum to the Skyline Mine PHC). A level II investigation was conducted using the methods of the USDA Forest Service. Two reaches were located on Mud Creek. Reach #4 is located just below the confluence of Eccles and Mud Creeks. The riparian community was approximately 91 feet wide and consisted of willows, sedge and rush grasses. Approximately 80% of the banks were vegetated and stable. Downstream, at Reach #5, the width of the riparian community broadened to 120 feet and consisted mostly of willows growing in both riparian and wetland communities. Approximately 60% of the bank was vegetated and stable. (February 27, 2002 EarthFax report in Appendix D of July 2002 Addendum to the PHC).

The gradient of Mud Creek is approximately 0.0091 ft/ft with a sinuosity ratio of 1.6. These figures were derived from aerial photographs (personal communication, November 15, 2002, Rich White, Earth Fax Engineering, with Priscilla Burton of the Division). The channel flattens on approach to Scofield Reservoir with an average gradient of 0.02 to 0.1 ft/ft. Channel subsoils are silty sands and clayey silts, classified by the 1988 Carbon County Soil Survey as Silas and Silas Brycan series. The results of laboratory analysis on the physical properties of the soils in the creek are found in Appendix B of Appendix D of the July 2002 Addendum to the Skyline Mine PHC. Cross sections of the channel describe a channel bed that is 96% cobbles and gravels and side slopes that are 100% sand, silt and clay (Appendix E of Appendix D of the July 2002 Addendum to the Skyline Mine PHC). Low flow terraces are limited in extent and the channel is incised. There is no broad flood plain.

The current stream flows do not approach natural bankfull discharge (Table 5 of Appendix D July 2002 Addendum to the Skyline Mine PHC). The erosional stability of the Mud Creek channel beds and banks was evaluated and found to fall within the allowable velocity using the techniques of evaluation described by the Soil Conservation Service (Table 3 of Appendix D July 2002 Addendum to the Skyline Mine PHC).

A stability evaluation of the channel concluded that well vegetated slopes (grasses and willows) are able to handle the increased flow without erosion (Appendix D of the July 2002 Addendum to the Skyline Mine PHC). There are channel banks of Mud Creek that are not well vegetated and the landowners of these lands should avail themselves of programs that would provide assistance to armor the bank and divert flow to allow the eroding banks an opportunity to reclaim. Canyon Fuel Company is willing to help in this effort, and the Division is facilitating a meeting with the Natural Resources Conservation Service and the landowner for this purpose. The July 2002 Addendum to the Skyline Mine PHC (page PHC A-21) commits to armoring stream channel banks, planting of stream bank stabilizing vegetation or redirection of some flows

should monitoring reveal that deterioration of stream chemistry or stream morphology or vegetative community is related to mine water discharge.

In conclusion, the potential negative impact to Mud Creek from the increased flows is not the interruption of agricultural activity but the acceleration of instability in the channel banks and increased erosion of the stream channel in reaches of the channel that are not well vegetated. The area impacted would be very small in relation to the acreage being pastured and would be negligible to the total production of the pastures.

Stations along Mud Creek will be monitored four times a year (seasonally) for a period of one year following a reduction in discharge to 350 gpm or less. Sediment loading in Mud Creek will be computed from the TSS and flow data collected. Annual evaluations of the stream will be summarized in a report to be submitted to the Division with the Skyline Mine Annual Report. The monitoring plan will also evaluate the changes in stream morphology and vegetation at the stations over the same time period.

Ground Water

Ground Water Quality

With few exceptions ground water is a calcium bicarbonate type. Spring water is generally of better quality than well or mine discharge water. Quality is usually highest in the second quarter of the year when flows are greatest. Samples are rarely taken during the first quarter because of snow cover. Water quality data are available for only one year, four samples from October 1993 to October 1994, from the monitoring well WRDS#1 at Skyline's waste rock disposal site. The WRDS wells have been dry at all other samplings. Locations of seeps and springs sampled for the Skyline and White Oak/Belina mines are shown on Figure 5 The Division feels these sampling locations adequately characterize the hydrologic regime.

The USGS analyzed water from 140 springs in the Huntington and Cottonwood Creek basins between July 1977 and September 1980. None of the analyses found concentrations over U. S. EPA drinking water standards (Engineering-Science, 1984, p. 2.39). Total dissolved solids content of the ground water from springs and seeps ranges from less than 125 ppm in the Skyline permit area to 4000 ppm at the confluence of the Price and San Rafael Rivers with the Green River.

Ground Water Quality - Castlegate Sandstone

Spring S10-1, the only monitored spring that discharges from the Castlegate or near the Castlegate-Blackhawk contact, has had an average TDS concentration of 99 mg/l and a maximum of only 165 mg/l. This low TDS is attributed to the lack of shale in the Castlegate. The water is low in nutrients and metals. The pH averages 7.3 and alkalinity is typically 25 times acidity. Total and dissolved iron average 0.28 and 0.08 mg/l and total and dissolved manganese average 0.04 and 0.06 mg/l. Springs issuing from the Castlegate Sandstone typically have less than 180 mg/l TDS (Engineering-Science, 1984, p. 27).

Ground Water Quality - Blackhawk and Star Point Formations

Total Dissolved Solids (TDS)

Springs and seeps monitored for the White Oak/Belina mines typically have TDS values in the range of 200 to 300 mg/l. Quarterly average values go from a low of 96 mg/l in the second quarter at S25-13 to a high of 363 mg/l during the fourth quarter at S24-12. The highest TDS reported is 9187 mg/l at S36-19.

Skyline's data show that spring waters from perched aquifers in the Blackhawk Formation typically have TDS levels of 240 mg/l (Coastal, 1993, p. PHC2-6). The highest TDS is 646 mg/l at S13-2 in the north fork of Eccles Creek near the mine. Average TDS at this spring is 347 mg/l. High TDS is also found at S17-2, next to Eccles Creek just above the Skyline loadout and at S24-12 at the head of South Fork.

Water discharged from the White Oak/Belina mines and well water from the Blackhawk-Star Point aquifer had TDS levels of 180 to 480 mg/l in 1979 (Engineering-Science, 1984, Table 1). Average TDS in water discharged from the White Oak/Belina mines from 1981 to 2000 was 674 mg/l, but TDS values as high as 1340 mg/l were measured (Valley Camp, 1993, p. 700-22).

Water discharged from the Skyline mines contained an average of 467 mg/l TDS in 1984, but this had increased to an average of 1273 mg/l in 1991. The average had reduced to 520 mg/l in 2001. Average sulphate levels went from 150 mg/l in 1984, to 673 mg/l in 1991, and down to 162 in 2001. TDS in the waste rock disposal site monitoring well averaged 552 mg/l in 1992-1993.

Iron and Manganese

Waddell (1982) measured dissolved iron concentrations of 0.720 mg/l at the Clear Creek Mine. At the spring near the mouth of Eccles Canyon, which is the same as Skyline's S17-2, Waddell measured 0.860 mg/l. Skyline's twenty-four measurements of dissolved iron at S17-2 between 1981 and 2002 averaged 0.34 mg/l. Both of these ground water sources issue from faults or fractures in the Star Point Sandstone.

For spring waters from perched aquifers in the Blackhawk Formation, total and dissolved iron average 0.71 and 0.10 mg/l, respectively, and total and dissolved manganese both average 0.02 mg/l.

In water discharged from the Skyline mines, total and dissolved iron averaged 1.4 and 0.09 mg/l, respectively. Total and dissolved manganese levels averaged 0.1 and 0.07 mg/l at the No. 1 mine and 0.07 and 0.08 mg/l at the No. 3 mine. Water from wells is generally similar to mine discharge water (Engineering-Science, 1984, p. 27). At the waste rock disposal site, water from the monitoring well averaged 0.540 mg/l total iron and 0.048 mg/l total manganese in the four samples taken in 1992-1993 (1993 Annual Report).

Water discharged from the White Oak/Belina mines between 1981 and 1989 contained an average total iron concentration of 0.56 mg/l. Total iron exceeded 1.0 mg/l 25 times from 1981 to 1985, with a maximum of 4.60 mg/l, but from 1985 to 1989 levels exceeded 1.0 mg/l only 3 times and the maximum for that period was 2.2 mg/l. From 1989 through 2000, Total iron exceeded 1.0 mg/l/day 6 times with the last exceedence in April 1998 being the highest reported value of 7.27 mg/l. From 1985 through 2000 the 30-day maximum of 70 mg/l Total Iron was exceeded 6 times, with the maximum being 155 mg/l in April 1985 and the last being 108 mg/l in May 1997.

Other Metals

Dissolved copper has exceeded the 1 hour average criterion for Class 3A waters in the four samples from the monitoring well at Skyline's waste rock disposal site (1993 Annual Report). There are no applicable standards for total metals in water, but what appear to be elevated concentrations of total copper, up to 0.42 mg/l, were found between 1981 and 1991 in the springs sampled by Skyline. Total lead up to 0.05 mg/l and total zinc up to 0.185 mg/l were also found (Coastal, 1993, Volume 4). Data from the White Oak/Belina mines show concentrations of total lead up to 0.17 mg/l and of total zinc up to 0.135 mg/l, however, total copper values are all 0.02 mg/l or lower. Analyses were not done for dissolved copper, lead, and zinc (Valley Camp, 1993, Appendix 722.100a). The igneous dikes in the area may be the source of these metals.

pH

The range of average pH of ground water from monitored seeps and springs in the Mud Creek and Huntington Creek basins is 7.1 to 8.0 based on measurements at numerous locations. Extremes of 6.0 to 9.5 have been reported. Where both acidity and alkalinity have been determined, alkalinity is typically at least 25 times acidity (Coastal, 1993, p. PHC2-6).

In water discharged from the Skyline mines, alkalinity is typically 40 times acidity and average pH is 7.4 (Coastal, 1993, p. PHC2-7). Water discharged from the White Oak/Belina mines has an average pH of 7.7, with measured high and low of 9.7 and 6.7 (Valley Camp, 1993). The average pH measured at the waste rock disposal site was 6.6 in 1992-1993, ranging from 6.51 to 6.84 (1993 Annual Report).

Ground Water Quantity

Flow of springs and seeps issuing from the perched aquifers varies seasonally, indicating local systems. Recharge for most of these springs and seeps probably originates in the small surface depressions or basins in the immediate vicinity. Higher flows occur during spring snowmelt, and flows in the autumn are often lower by an order of magnitude. Some seeps dry completely during the summer. Sustained flows from springs are low; only 4 springs on the Skyline permit area were flowing at 10 gpm or more during the 1978 autumn inventory, and most flowed at 2 gpm or less. Flows are also sensitive to the amount of precipitation during the winter. Springs on the Skyline property were surveyed by OSM contract staff in 1983 following a very wet winter. One unidentified spring was flowing at 300 gallons per minute in late June but by early August it was flowing only 4 gallons per minute. A nearby spring flowed 100

gallons per minute in June and could not be located, apparently because it was dry, in August (Engineering Science, 1984, p. 34). An additional Seep and Spring survey was conducted by the Skyline Mine in the Winter Quarters / North Lease area in 1992 and 1993, which was used in determining the current water monitoring locations.

According to the Seep and Spring survey conducted in the White Oak/Belina area in the summer of 1990, a total of three seeps/springs are affected by the 2001 Surface mining in the area. Seeps/springs S25-13, S25-14, and 30-1 are all located up-gradient of the surface mining. Seep/Spring S25-13 is the only site that provided consistent enough flow to be continually monitored. Recorded quarterly flow measurements from site S25-13 range from 0 to 60 gpm, and average <5 gpm. It is anticipated that any flow from the three seeps or springs will still report to Whisky Creek and not be significantly impacted by the surface mining.

The Blackhawk-Star Point aquifer provides baseflow to Mud Creek and the lower reaches of Eccles Creek, but the volume of ground water discharged from the regional Blackhawk-Star Point aquifer has not been quantified. Vaughn Hansen Associates (1979) estimated that 64% of the flow of Eccles Creek was from ground water discharge, with the major portion of this flow entering the stream from the Star Point Sandstone. The Star Point can be presumed to provide baseflow to lower reaches of other Mud Creek tributaries where it is exposed. Low flows of Mud Creek are sustained principally by ground water flowing up from the regional aquifer (Waddell, 1983b). Discharge through fractures such as the O'Connor fault and the Pleasant Valley fault zone has been documented. Some baseflow also probably occurs directly through unfractured but permeable zones in the Star Point Sandstone. The Star Point Sandstone does not crop out in the headwater drainages of Mud and Huntington Creeks and the regional Blackhawk-Star Point aquifer does not discharge from springs or otherwise contribute to surface flow in these areas.

As discussed earlier, Skyline Mine encountered considerable groundwater inflows beginning in March 1999. Due to the close proximity of Electric Lake to the mine, and a fault running between the lake and the mine, there was concern that lake water could be flowing into the mine. PacifiCorp made two preliminary investigations that indicated this might be occurring. However, the investigations were not definitive or conclusive in establishing a connection between the lake and the mine. DOGM comparison of lake elevations and groundwater potentiometric surfaces and comparison of flow rates also suggested that such a connection might be occurring. As a result, HCI and Petersen Hydrologic expanded their investigations to explore this concern. Independently, they both resolved that there is probably not a connection between Electric Lake and the inflows into Skyline Mine. This is based on the following considerations:

- ^{14}C dating shows the 10-Left inflow waters to be 4,600 years old and JC-1 well waters (in the same fault as 10-Left) to be 6,300 years old.

- The chloride content of Electric Lake waters is nearly four times that of mine inflow waters and chloride cannot be removed, except by dilution, no matter how long the water is in the ground.

- Mine inflow waters contain about 50% greater bicarbonate concentrations than lake water. Mine inflow waters contain over 3 times the magnesium content of lake water. Electric Lake waters are supersaturated with respect to bicarbonate and magnesium so they cannot acquire more of these constituents.

- Inflow water temperatures are warmer than mine temperatures and correlate in depth to the Star Point Sandstone formations below the coal seam. The earth is hotter the further down you go.

- The dissolved oxygen content of Electric Lake water is over 10 times greater than that of mine inflow waters. While dissolved oxygen can be readily removed from groundwater, it seems unlikely that would occur while moving large volumes of water rapidly through the fractures.

Tritium analysis over time suggests that there is a component of modern water in the 10-Left inflow waters. Modern water is water that is less than 50 years old, as determined by such tritium analysis. Estimates indicate that about 10% of the inflows at 10-Left are comprised of modern water. The source of this water is not known and could originate in groundwaters adjacent to the fault near 10-Left, from surface waters (including Electric Lake), or a combination of both.

V. IDENTIFICATION OF HYDROLOGIC RESOURCES

(IDENTIFY HYDROLOGIC RESOURCES THAT ARE LIKELY TO BE AFFECTED AND DETERMINE WHICH PARAMETERS ARE OF IMPORTANCE FOR PREDICTING FUTURE IMPACTS TO THOSE HYDROLOGIC SYSTEMS.)

The Class 3A streams in the CHIA are protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain. The drainages of upper Huntington Creek and Mud Creek have both been identified as habitat for naturally reproducing populations of cutthroat trout. Scofield Reservoir is stocked with rainbow trout but contains cutthroat trout that have reproduced in tributary streams, including Mud, Eccles, Winter Quarters, and possibly Boardinghouse Creeks.

Burnout Creek has been identified as a spawning habitat for the native Yellowstone cutthroat trout population in Electric Lake. Cutthroat trout have been observed in large numbers in James Creek, just south of Burnout Creek, during spawning season. Boulger Creek has been studied as a stream that could be developed into for a spawning, and Skyline has provided funds to the USDA Forest Service for construction of a fish ladder to bypass Boulger Reservoir. Utah Division of Wildlife Resources is concerned about potential loss or alteration of these and other important fish habitats in and around Electric Lake.

Prior to the addition to the North Lease there were 194 surface water rights, 106 for stockwatering, 25 for irrigation, 55 undeclared, and the remaining 8 for other uses. Most perennial and ephemeral streams in the CIA have water rights filed on them. Water rights have

been filed on 112 springs and 23 wells or tunnels. Stockwatering was the declared use on 62 of the water rights, 41 were for other uses, and the remaining 32 were undeclared. Springs and seeps are important to wildlife, though there are no filed rights that declare this as a use. Specific water rights information for the North Lease have been updated in October, 2002 (second binder volume 4- Water Rights).

Both the Skyline and White Oak/Belina mines utilize water from wells in Eccles Canyon that were drilled into fault zones in the Star Point Sandstone. Wells near the Skyline and White Oak/Belina loadouts in Pleasant Valley produce water from both alluvium and Star Point Sandstone. Water from these wells is for domestic, stockwatering, and other uses.

During the 1979-1980 water year, Mud Creek contributed approximately 16% of the inflow to the Scofield Reservoir. Scofield Reservoir discharges into the Price River, which is used for irrigation in Castle Valley and provides the municipal water supply for the city of Price. Upper Huntington Creek drainage contributes an unknown amount to the total discharge of Huntington Creek, but estimates indicate it could be 25% or more.

Table 13 lists potential impacts to the hydrologic resources, indicates if there is a possibility for cumulative impact outside the permit areas, and identifies analytical parameters or other indicators that need to be monitored to track potential impacts of the permitted mines.

Periods of high suspended solids in the streams are normal as well as periods of high runoff, so fine sediments are flushed from the streambed and clean gravel beds for trout spawning are left. Sediment cleared from the streambed simply moves downstream, and in Mud Creek and upper Huntington Creek basins the sediment eventually accumulates in Electric Lake or Scofield Reservoir. When runoff is low, fine sediments may remain and spawning gravels become unavailable. Fine sediments increase trout egg and fry mortality through suffocation. Invertebrates are also impacted by sedimentation through loss of habitat or mortality. Invertebrate diversity may decrease but resistant or adaptive species will remain. Impacts on invertebrates may reduce the supply of food for the trout. Construction, mining, and other activities produce the same negative impacts by decreasing flow or increasing sedimentation beyond the capacity of the stream to flush itself. Coal fines have the same negative impacts as fine, natural sediments.

Fine sediments, including coal fines, have covered portions of the streambed below the Skyline Mines and have been trapped behind beaver dams in Eccles Creek. Removal of beaver dams has been done in an attempt to increase access from Scofield Reservoir to Eccles Creek for spawning cutthroat trout and to facilitate the flushing of fine sediments from the streambed. Sediment traps along Mud Creek have been suggested by UDWR as a solution that would maintain access to the stream for spawning trout while reducing sedimentation in Scofield Reservoir. The increased flow in Eccles and Mud Creeks, resulting from the pumping from the Skyline Mine, has had a beneficial impact by flushing more fine sediment from these streams.

Temperature increase can reduce dissolved oxygen in a stream. Changes in temperature may directly influence algae growth rates. Winget (1980) found that water temperatures in upper Huntington and Eccles Creeks equilibrated quickly with air temperatures because of the

turbulence from rough channels and low flows. However, UDOGM found that the temperature of Eccles Creek increased significantly, 43 degrees to 54 degrees, as it passed through the 72-inch bypass culvert and received the sediment pond discharge (UDOGM, 1988). With the steep gradients and rocky beds of the streams in the CIA, entrainment of oxygen and equilibration with air temperature should be sufficient to eliminate temperature as a factor in habitat quality.

Toxic materials in the water will reduce trout and invertebrate populations through mortality or avoidance. Nitrite concentrations in excess of 0.06 mg/l result in trout mortality. The long term LC_{50} exposure level for trout to nitrate is 1060 mg/l. Phosphorus in excess of 0.04 mg/l is not toxic to trout but does lead to eutrophication. Toxic levels of nitrite and eutrophication from excessive nitrogen and phosphorus were identified by the Utah Division of Wildlife Resources as causes of fish and invertebrate declines in Eccles Creek in 1987 - 1988.

Increased TDS has not been identified as a problem in any of the fisheries. There is no water quality standard for TDS for aquatic wildlife, but 1200 mg/l is the limit for agricultural use. There is a possibility of cumulative effect outside of individual permit boundaries in the Mud Creek drainage. TDS and sulfate exceeded UPDES limits at the Skyline mines because of gypsum contamination in the limestone used for dust control. The discharge returned within UPDES limits after application of contaminated rock dust ceased and continuing flow diluted or flushed residual contamination.

Sediment, total nitrate, phosphorous, and dissolved oxygen have been identified as water quality concerns for Scofield Reservoir. High nitrogen and phosphorus levels lead to increases in algae and aquatic vegetation, which in turn leads to a deterioration of water quality. The reservoir may become eutrophic unless measures are taken to limit nutrient inflow (Waddell and others, 1983a). The increased flow in Eccles and Mud Creeks, resulting from the pumping from the Skyline Mine, may have had a beneficial impact by increasing the inflow of low TDS water into the reservoir; however, the volume of nutrients being added by this flow has not been determined yet.

During the 1979-1980 water year, Mud Creek contributed approximately 16% of the inflow to the reservoir, 18% of the total dissolved solids (TDS), 28% of the total suspended solids (TSS), 18% of the total nitrogen, and 24% of the total phosphorous. During snowmelt, concentrations of nitrogen and phosphorus reached 21 and 4.3 mg/l at the Eccles Canyon gaging station. Most of this was in suspended form, and these unusually high concentrations were probably due to flushing of residual debris from 27 acres of forested land cleared in 1979 for fire protection around the mine portal and road right-of-ways. (Waddell and others, 1983a).

Perched systems have limited storage and recharge capacities, and when they are intercepted by mining operations the resulting in-mine floss decline rapidly. Draining of these perched systems may cause individual springs or seeps to disappear but should have little impact on the hydrologic balance of the area. Flows into the mines that persist for more than 30 days should be considered as possibly intercepting surface water through a natural or subsidence induced fracture system.

Surface-mining methods employed at the White Oak/Belina mine may temporarily disrupt the groundwater and surface flow in the area. It is anticipated seeps and surface flows currently reporting to Whisky Creek will eventually re-surface through the fill or report at the toe of the fill. Any encountered seeps greater than 3 gpm will have a French drain installed to ensure the flow reports to the surface.

Operations at the Skyline Mines are drawing down the potentiometric surface of the regional aquifer, which can induce increased recharge and downward flow through the overlying unsaturated zone. This would have a minimal, probably undetectable effect on perched aquifers or soil moisture because of the generally low hydraulic conductivity of the Blackhawk Formation. However if the area involved were large enough, it could be one process leading to measurable interbasin transfer of water. The cone of depression and resulting effects on the overlying unsaturated strata will diminish with time after mining cease

POTENTIAL HYDROLOGIC IMPACTS	Possible Cumulative Effect Outside Permit Areas	Parameters of Importance and Other Indicators for Predicting Future Impacts
• *Increased sediment yield from disturbed areas* - Alteration or loss of fisheries in streams and reservoirs. Increased rate of sedimentation in reservoirs. Coal spillage from hauling operations and storage. Loss of riparian habitat.	YES	• Sediments • Fish and Macroinvertebrates
• *Flooding or streamflow alteration* - increase or decrease in streamflow.	YES	• Flow • Sediments • Fish and Macroinvertebrates
• *Contamination of ground and surface water from acid- or toxic-forming or toxic materials* - Contamination of surface water from coal hauling operations and storage. Hydrocarbon contamination from above-ground storage tanks or from the use of hydrocarbons in the permit area. Contamination from road salting. Gypsum used in dust control contaminating mine discharge. Nutrients in mine discharge.	YES	• Sediments • TDS • pH • Nutrients • Specific cations and anions • Oil and Grease • Fish and Macroinvertebrates
• *Subsidence damage to springs and streams* - increased sediment load, diminution of flow, physical barrier to fish migration.	YES	• Flow • Sediments • Fish and Macroinvertebrates
• *Alteration or destruction of fisheries and aquatic habitats* - loss of flow, loss of access to stream, loss of fish spawning habitat, increased sediment load, acute or chronic toxicity, eutrophication, loss of food supply.	YES	• Flow • Sediments • Fish and Macroinvertebrates • TDS • pH • Nutrients • Specific cations and anions
• *Loss of ground water or surface water availability* - water rights, wildlife uses.	YES	• Flow
• *Reduction of flow due to interbasin transport of intercepted water.*	YES	• Flow

Table 13

VI. MATERIAL DAMAGE CRITERIA - RELEVANT STANDARDS AGAINST WHICH PREDICTED IMPACTS CAN BE COMPARED.

Water within the CIA is used for watering livestock and wildlife, mining coal, domestic use, fisheries, and recreation. Downstream, the water is additionally used for irrigation and domestic and industrial needs. Land within the CIA is used for wildlife habitat, grazing, recreation, and mining coal. Anticipated post-mining uses are for wildlife habitat, grazing, and recreation.

Quality

Water quality standards for the State of Utah are found in R317-2, Utah Administrative Code. The standards are intended to protect the waters against controllable pollution. Waters, and the applicable standards, are grouped into classes based on beneficial use designations.

Scofield Reservoir is classified (latest classification December 7, 2001) by the Utah Division of Water Quality as:

1C - protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.
2B - protected for secondary contact recreation such as boating, wading, or similar uses
3A - protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain.
4 - protected for agricultural uses including irrigation of crops and stock watering.

Scofield Reservoir is: (E-mail from Louis Berg, Utah Division of Wildlife Resources, to DOGM dated February 4, 2002).

- A culinary water source.
- One of the top four trout fishing lakes in Utah.
- Has over a one million dollar annual recreational fishing value.

Electric Lake is classified (latest classification December 7, 2001) by the Utah Division of Water Quality as:

2B - protected for secondary contact recreation such as boating, wading, or similar uses
3A - protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain.
4 - protected for agricultural uses including irrigation of crops and stock watering.

Streams in both basins are classified as:

1C, 3A, and 4.

Furthermore, surface waters located within the outer boundaries of a USDA National Forest, with specific exceptions, are designated by the Utah Division of Water Quality as High

Quality Waters - Category 1 and are subject to the state's antidegradation policy. This antidegradation policy is that waters shall be maintained at existing high quality and new point source discharges of wastewater, treated or otherwise, are prohibited (Utah Administrative Code, R317-2-3.2 and R317-2-12.1). All of the upper Huntington Creek drainage and most of the headwater drainages of eastflowing tributaries to Mud Creek, including the Skyline mines disturbed area, are within USDA Forest Service boundaries and are protected by this policy. Discharge from the Skyline Mines sediment pond is into the 72 inch bypass culvert. The White Oak/Belina mines, both loadouts, and the waste rock disposal site are outside forest boundaries.

The Utah Department of Environmental Quality, Division of Water Quality can authorize a coal mine to discharge into surface waters under the Utah Pollutant Discharge Elimination System (UPDES). The permits for the mines contain site-specific limitations on total dissolved solids, total suspended solids (or total settleable solids for precipitation events), iron, oil and grease, pH. The Skyline Mines have an additional limitation on sulfate.

Water quality standard for nitrate in Class 1C waters is 10 mg/l. Nitrate levels above 4 mg/l are considered an indicator of pollution, usually from sewage, in all waters. For trout, the long term LC_{50} exposure level to nitrate is 1060 mg/l.

There is no water quality standard for nitrite, but concentrations in excess of 0.06 mg/l produce mortality in cutthroat trout (UDWR, 1988).

The water quality standard for Class 3A waters for phosphorus is 0.05 mg/l. Levels in excess of 0.04 mg/l are not toxic to trout but are excessive and promote eutrophication (UDWR, 1988). By state standards for Class 1C, 2A, 3A, and 3B waters, phosphate in excess of 0.05 mg/l is a pollution indicator.

The recommended limit for MBAS, a detergent or surfactant, is 0.2 mg/l (Steve McNeil, Utah Dept. of Health, personal communication in UDOGM, 1988).

There is no water quality standard for oil and grease, but the UPDES permit limit for both the White Oak/Belina and Skyline mines is 10 mg/l. A 10 mg/l oil and grease limit does not protect fish and benthic organisms from soluble oils such as those used in longwall hydraulic systems, and UDWR has recommended soluble oils be limited to 1 mg/l (Darrell H. Nish, Acting Director UDWR, letter dated April 17, 1989 to Dianne R. Nielsen, Director UDOGM).

Increased TDS has not been identified as a problem in any of the fisheries. There is no water quality standard for TDS for aquatic wildlife, but 1200 mg/l is the limit for Class 4, agricultural use.

Physical or chemical indicators alone do not fully evaluate water quality in streams. Macroinvertebrates are excellent indicators of stream quality and can be used to evaluate suitability of a stream to support a trout fishery and other aquatic life. Baseline studies of invertebrates by the USGS (Waddell, 1982) and Winget (1980) and studies done in conjunction with mine operations (Coastal States, 1993; ERI, 1992) provide standards against which actual stream conditions can be evaluated. Cutthroat trout populations are also excellent indicators of

stream quality. UDWR surveys of trout populations in Eccles, Winter Quarters, and Huntington Creeks have established baseline conditions.

The maximum temperature for Class 3A waters is 20 degrees C (68 degrees F). The maximum allowable change for Class 3A waters is 2 degrees C (3.6 degrees F).

Sedimentation

Sedimentation of reservoirs and the eventual lose or diminution of their value is inevitable. Waddell and others (1983a and b) examined sedimentation in Scofield Reservoir. A bathymetric survey was done to a) estimate total sediment yield from inflowing streams; and b) to provide detailed bathymetric measurements at selected cross sections to allow more accurate evaluation of future deposition. The rate of sediment accumulation and deposition was estimated by using lead^{210} to determine the relative ages of sediment samples from cores. Increased sedimentation in the reservoirs due to mining in the adjacent drainages might be detectable using such techniques, but direct monitoring of inflowing streams is probably more effective.

Changes in sediment size distribution in streams can be determined by comparison with past studies (Winget, 1980; Coastal States, 1993, Table 2.8-3). Winget identified 15% or more of materials finer than 0.85 mm in diameter as a critical measure of biotic potential, that is whether or not fish eggs and fry and many macroinvertebrates would be suffocated.

Interbasin Diversion

Wadell and others (1983b) examined the issue of interbasin diversion and the possibility that interbasin diversion could be quantified through measuring and comparing the low flow rates of streams. The concern in that study was for diversion from the Mud Creek basin to Huntington Creek: the current concern is for diversion in the opposite direction.

Based on correlations of low flows in several streams in the southern Wasatch Plateau, Wadell (1981 in Wadell and others, 1983b) found that with 5 years of continuous discharge records, monthly flows for August, September, and October could be estimated with a standard deviation of 20%. From measurements in 1979 and 1980 it was calculated that the average ratio of the low flows of Mud and Fish Creeks during October, the low flow month with the least variation, was 0.42.

Wadell and others (1983b, p. 129) approximated the amount of water that would need to be diverted from or to the Mud Creek basin before it could be detected. Assuming 1) a 20% standard deviation, 2) an average flow ratio of 0.42 between Mud Creek and Fish Creek, 3) an average flow of Fish Creek in October of 330 acre-feet/year (5.4 cfs),

$$(\pm 0.20)(330\text{acrefeet})(0.42) = \pm 28\text{acrefeet} = \pm 0.45\text{cfs}.$$

A longterm increase or decrease of flow in Mud Creek of at least 0.45 cfs would be detected 68% of the time by correlating the October flows of Mud and Fish Creeks. The USGS

have had stream gaging stations on Eccles, Mud, and Fish Creeks. As of November 2002, Mud Creek and Fish Creek continue to be monitored on a regular basis.

Discharges of Burnout, Boulger, and Huntington Creeks into Electric Lake are monitored. In addition, PacifiCorp monitors cumulative inflow when the lake is low. They use a weir located in the lake bottom immediately opposite James Canyon. This weir does measure the James Canyon wells pumped input to the lake. This weir was installed in June 2002 so records are short in duration. Estimated discharge from the upper Huntington Creek basin is 16,000 acre feet per year (22 cfs) based on the measured discharges of Burnout and Huntington Creeks and 27,000 acre feet per year (37 cfs) based on predicted average yield. From 1983 to 1993 discharge of Huntington Creek at USGS station 09317997 near the town of Huntington averaged 54,480 acre feet per year (75 cfs), so these estimated discharges would comprise 29% to 50% of total flow. The upper basin drains only 20,000 acres, or 17% of the 113,900 acres in the Huntington Creek drainage, so these estimated discharges appear to be too large. Water storage changes in Electric Lake are monitored daily with an accuracy of 5acre-feet/day (2.5 cfs), 6% to 11% of estimated average daily flow into the lake. Diversion of water between Mud Creek and upper Huntington Creek basins would probably be undocumentable in the Huntington Creek basin because of the lack of sufficient historic monitoring and precise data.

As discussed previously, the inflows to Skyline Mine have been pumped into Eccles Creek, which is in the Price River drainage. There has been some discussion among water rights holders as to whether water has been diverted from the Huntington Creek, San Rafael River drainage. This is because all of the mine inflows are located west of the Mud Creek/Huntington Creek surface water drainage divide. There are several complex issues involved before any conclusions can be drawn about interbasin diversion.

1. The surface water drainage divide may or may not be the same as the groundwater divide. Given the complex faulting in the mine permit area, the natural groundwater divide is probably NOT the same as the surface divide.

2. Since Skyline Mine began mining in 1983, the underground mining has probably altered the natural groundwater potentiometric surface. It is anticipated that the potentionmetric flow-path will return once mining ceases.

3. It's very difficult to determine groundwater divide characteristics and it takes considerable time and expense. However, this is being monitored through age-dating, flow measurement, water quality analysis, modeling, etc.

4. Current information indicates the source of the mine inflows to be an isolated underground reservoir in the several Star Point Sandstone layers below the coal seams being mined. The horizontal extent of that reservoir is still being defined through ground water modeling and associated water monitoring.

Given present information, it does not appear there is any interbasin diversion.

VII. ESTIMATE OF THE IMPACTS OF MINING ON THE HYDROLOGIC RESOURCES

Quantity

Increased Streamflow

Average discharge from the White Oak/Belina #1 Mine between 1981 to 1989 was 0.19 cfs (Table 724.100a). No water had been discharged from the White Oak/Belina #2 Mine as of 1993. Discharge from Pond 004 was sporadic from 1995 through 2000 with no discharges after August 1999. Average discharge flow from 1995 through 1999 was 74 gpm/day. Coal production from both mines has averaged approximately 0.5 million tons per year, so a very rough estimate of water production is 0.4 cfs per million tons of coal mined. Projected maximum coal production from White Oak/Belina #1 and #2 Mines is 2 million tons per year, which would result in an estimated discharge of 0.8 cfs of water.

If both coal mining operations were to reach maximum production simultaneously, the total projected increase of flow in Mud Creek would be 2.0 cfs. This would also be the increase in Eccles Creek if the White Oak/Belina mines were to discharge all their water from the present portals. But maximizing White Oak/Belina's production to 2 million tons per year would probably require at least one additional portal, either in Boardinghouse or Finns Canyon, and part of the water produced by mining would probably be discharged through that portal. Discharge from Pond 004, which serviced both the White Oak/Belina #1 and #2 Mines, indicated the water anticipated was not encountered during mining. Records indicate only sporadic flows were encountered.

Table 1 of the Skyline PHC (September 30, 1992) indicates production of 1 million tons of coal results in a minimum of 80 gpm (0.18 cfs) of water discharged from the mine. Table 1 indicates discharge rates have been as high as 180 gpm (0.40 cfs) per million tons of coal mined. The projection is made on Figure 2 in the Skyline PHC that maximum average discharge will be 550 gpm (1.22 cfs) when coal production reaches 6.5 million tons of coal annually.

Skyline's records show discharge was first monitored from the #3 Mine in 1983 and from the #1 Mine in 1989. Up to 1991 the average discharge from Skyline #1 was 0.35 cfs and from the #3 Mine was 0.5 cfs. This is discharged to Eccles Creek by way of the sediment pond. When stream flow is naturally low in late summer to early autumn, discharge from the Skyline mines has been estimated to account for as much as 60% to 70% of flow in Eccles Creek.

Pumping of mine inflow waters from Skyline Mine into Eccles Creek has increased the streamflow to about 10 times normal amounts. Eccles Creek is well armored and has shown little or no visual indication of impacts. These same flows continue on to Mud Creek which increases that stream to about 3 times normal amounts. Mud Creek has shown some minor visual indication of streambank erosion. Both streams are being continuously monitored to determine possible impacts. Pumped volumes are expected to decline over the next 19 months and stabilize at 2,900 gpm for the next 5 years. Based the current information and conditions, the estimated impacts due to increased stream flow are minimal and declining.

Interbasin Diversion

Estimate Prior to November 2002

Coastal has estimated that the interbasin diversion from the Huntington Creek basin to the Mud Creek basin from operation of the Skyline mine was 95 gpm (0.21 cfs) in 1991. From Table 1 and Figure 2 of the Skyline PHC it can be estimated that maximum interbasin diversion by the Skyline operations could be as much as 370 gpm (0.82 cfs), 68% of the projected maximum average discharge of 550 gpm.

Approximately 22% of the White Oak/Belina permit area is in the Huntington Creek basin, but as of 1993 only a small portion of the White Oak/Belina #1 and none of the White Oak/Belina #2 workings extended beneath that basin. The White Oak/Belina PHC contains an estimate that when the Second and Third West Mains in White Oak/Belina #1 Mine were pumped, 45 to 50 gpm (0.10 to 0.11 cfs) were diverted from the Huntington Creek basin to the Mud Creek basin.

Projected maximum coal production from White Oak/Belina #1 and #2 Mines is 2 million tons per year. In the previous section the estimate was made that at maximum coal production 0.8 cfs of water would be discharged. Assuming that 22% of the water would come from the Huntington Creek basin, the average interbasin diversion would be 0.2 cfs.

The maximum diversion of water from the Huntington Creek basin to Mud Creek basin that can be projected based on the above information is 1.0 cfs, or half of the maximum projected increase in flow. Most of this water would come from the saturated rocks of the Blackhawk-Star Point aquifer. But changes in the potentiometric surface in that aquifer can influence recharge and movement of ground water through the overlying unsaturated zone, so some of the water diverted from the Huntington Creek basin to the Mud Creek basin could come from surface runoff and spring discharges.

Estimate as of November 2002

Mine inflows to Skyline Mine have been pumped into the Price River drainage. While there has been discussion of the possibility of these waters having originated in the San Rafael River drainage, no evidence or demonstration of this is available. Several complex issues are involved in determination of interbasin diversion and the matter is still under investigation. Given present information, it does not appear there is any interbasin diversion.

Subsidence

Especially where overburden is minimal or fracturing is extensive, there is potential for the capture of ground water or surface water by subsidence cracks (Engineering-Science, 1984; Valley Camp, 1993, Appendix R645-301-724.600). Subsidence impacts are largely related to extension and expansion of existing fracture systems and upward propagation of new fractures. Because vertical and lateral movement of ground water in the permit area appears to be largely

controlled by fracture conduits, readjustment or realignment of the conduit system may potentially produce changes such as increased flow along fractures that are opened and diversion of flow along new fractures. Increased flow rates would potentially reduce residence time and improve water quality. Some of the perched, localized aquifers could be dewatered. Ground water diverted from seeps or springs fed by such systems would most likely emerge nearby at another surface location rather than drain down into the mine. Sealing of subsidence cracks by clays in the Blackhawk is expected to minimize long term effects of subsidence on the hydrologic systems.

Mines are designed to restrict subsidence to the permit areas. Because the perched aquifers of the Blackhawk Formation are lenticular and localized, there is little potential for the effects from dewatering these aquifers to extend beyond the permit area. Where mining and subsidence occur within the saturated rocks of the regional aquifer there will be a large increase in permeability locally. With time, permeability will decrease as fractures close and the potentiometric surface will establish a new equilibrium. Residual impacts should be restricted to the previously mined area and will probably be negligible. The addition of the Winter Quarters / North Lease area has been a source of concern because portions of Winter Quarters and Woods Creeks are perennial in nature and support aquatic life. However, the combination of extensive overburden, the sealing and pliability of the overlying Blackhawk Formation, and the proposed mining of only one (1) coal seam drastically reduces the potential for any adverse impacts to occur due to subsidence.

VIII. MATERIAL DAMAGE DETERMINATION

Interbasin Diversion

Most of the water now being diverted by mining or expected to be diverted in the future comes from the deeper regional Star Point aquifer. This deeper aquifer does not contribute directly to the water budget of upper Huntington Creek basin; however, changes in the potentiometric surface can influence recharge and movement of ground water through the overlying unsaturated zone. Because the potentiometric surface is expected to recover to approximate pre-mining conditions after mining ceases, the overlying unsaturated zone should also be expected to recover to approximate pre-mining conditions.

The water currently being discharged from the Skyline Mine is ground water from beneath the Huntington Creek basin. Information provided by the mine indicates the source of this water is isolated storage in the Star Point Sandstone located beneath the coal seams. When mining ceases, the ground-water balance should return to pre-mining conditions, with no long-term impacts or material damage. The water being pumped from JC-1 to Electric Lake is likewise, not appropriated water.

Interbasin diversion of surface water is not anticipated and monitoring will continue. The volume of water available for storage in Electric Lake should not be affected. There should be no impact or material damage to either Electric Lake or Scofield Reservoir or areas downstream of them.

Loss of Habitats for Cutthroat Trout and Invertebrates

The critical spawning habitat for Yellowstone cutthroat trout in Burnout Creek is entirely within the Skyline permit area. Upper Huntington Creek and several of its tributaries are within the permit area, with the uppermost reaches of Huntington Creek extending upstream beyond the permit boundary. Large numbers of cutthroat trout have been seen in James Creek during spawning season, but it has not been determined which, if any, of the tributary streams other than Burnout Creek are cutthroat spawning streams. Boulger Creek is being modified to facilitate access by spawning trout.

Subsidence could produce physical barriers or loss of water flow sufficient to block fish from reaching spawning areas. Sedimentation caused by subsidence or other mine related activities could bury gravels used for spawning. These effects would probably be mitigatable by removal of barriers, restoration of flow, or sediment control and no material damage would result. A study done in Burnout Creek indicates that any impacts to the streams would be temporary and minimal.

Cutthroat trout are found in Eccles Creek and other streams of the Mud Creek drainage. This trout population has been heavily decimated by sedimentation, eutrophication, or toxicity several times in the past. These negative impacts generally have been caused by human activity in Eccles Canyon, namely road construction and coal mining. Beaver dams, which are natural traps for fine sediment, have interacted with the additional fine sediments produced by human activities to further reduce trout habitat in Eccles Creek. Trout populations have recovered when the impacting activities have ceased, been modified, or otherwise mitigated, although recovery has not been determined to be 100%.

No material damage to habitats for trout or invertebrates is anticipated and monitoring is ongoing.

Increase or Decrease in Stream-flow

There should be no noticeable change of flow in streams in the Huntington Creek drainage.

The impacts of mine inflows being pumped to Eccles Creek are minimal to that stream. It's well armored and shows little sign of degradation. The impacts to Mud Creek could be greater, but these are also minimal. As indicated previously, the potential negative impact to Mud Creek from the increased flows is not the interruption of agricultural activity but the acceleration of instability in the channel banks and increased erosion of the stream channel in reaches of the channel that are not well vegetated. The area impacted would be very small in relation to the acreage being pastured and would be negligible to the total production of the pastures. Both streams are being monitored continuously and possible impacts should be detected. No increase in discharge to Eccles Creek is anticipated as a result of mining in the North Lease.

At the cessation of mining, flows in Eccles Creek should return to pre-mining levels. Less flow during low flow periods will be the most noticeable effect. There is no present or foreseen material damage resulting from changes in flow due to present or projected discharge from the mines.

Water Quality

Historically, sulfate and TDS have increased in Eccles and Mud Creeks as a direct result of mining activities. UPDES limits were exceeded for a time at the Skyline sedimentation pond. The suspected source of the problem, gypsum used for dust control, was eliminated and water quality began to recover.

Prior to the 2001 inflows, Whisky Creek contributed approximately 6 percent of the flow in Eccles Creek and 2 percent of Mud Creek, respectively. The combination of limited degradation to water quality and minimal contribution of flow the cumulative impact to water quality within the Mud Creek basin is minimal.

In the late 80's and early 90's excessive nitrogen and phosphorous compounds were introduced into Eccles Creek by mining activities. Sewage was suspected as the source of the contamination at one time, but emulsified oil from longwall hydraulic systems and detergents were determined to be the sources. Fish and invertebrate populations were greatly reduced or eliminated from much of the stream, either because of avoidance or toxicity. Populations recovered after the causes of the contamination were eliminated. The possibility that excessive nitrogen and phosphorous nutrients in inflowing streams could lead to eutrophication of Scofield Reservoir is a concern.

The increased flows in Eccles and Mud Creeks, resulting from the pumping from the Skyline Mine, may have had a beneficial impact by diluting dissolved solids with low-TDS water. The impacts on sedimentation and nutrient loading in Scofield Reservoir have not been fully determined, but in the short term the increased flow has been beneficial in maintaining water above the dead-storage level during the recent three years of drought.

Water quality problems have so far proven to be mitigatable. No material damage to water quality is expected but water quality must be monitored diligently to avoid even short-term problems.

Erosion and Sedimentation

Fine sediments in Eccles Creek have increased as a result of road construction and coal mining related activities. Coal fines are a notable addition to the fine sediment load. One impact of the increase in fine sediment has been reduced trout and invertebrate populations because of suffocation of trout eggs and fry, burial of gravel used for trout spawning, and loss of suitable invertebrate habitats.

Fine sediments and runoff associated with the reconstruction of Upper Whisky Creek and surface-mining methods employed at the White Oak/Belina Mine are mitigated with all flows reporting to sedimentation ponds until vegetation standards are achieved. Native stream channel sediments in Upper Whisky Creek are being removed and stored to be used in reconstruction of the channel. Long term effects to the Mud Creek drainage system should be minimal.

A long-term concern is the loss of water storage capacity in Scofield Reservoir from sedimentation. In the past, sediment traps have been suggested as a means of removing the fine sediments originating in the Eccles Creek drainage. The increased flow in Eccles and Mud Creeks, resulting from the pumping from the Skyline Mine, may have had a beneficial impact by flushing more fine sediment from these streams. The impacts to sedimentation in Scofield Reservoir have not been determined yet.

Sedimentation has not been a problem in the Huntington Creek drainage.

Material damage from erosion or sedimentation is not anticipated and monitoring is ongoing.

IX. STATEMENT OF FINDINGS

No evidence of material damage from the actual mining operations has been found. No probability of material damage from actual or anticipated mining operations has been found. The actual and proposed coal mining and reclamation operations have been designed to prevent material damage to the hydrologic balance outside the permit areas.

CHIA--- MUD CREEK AND UPPER HUNTINGTON CREEK BASINS

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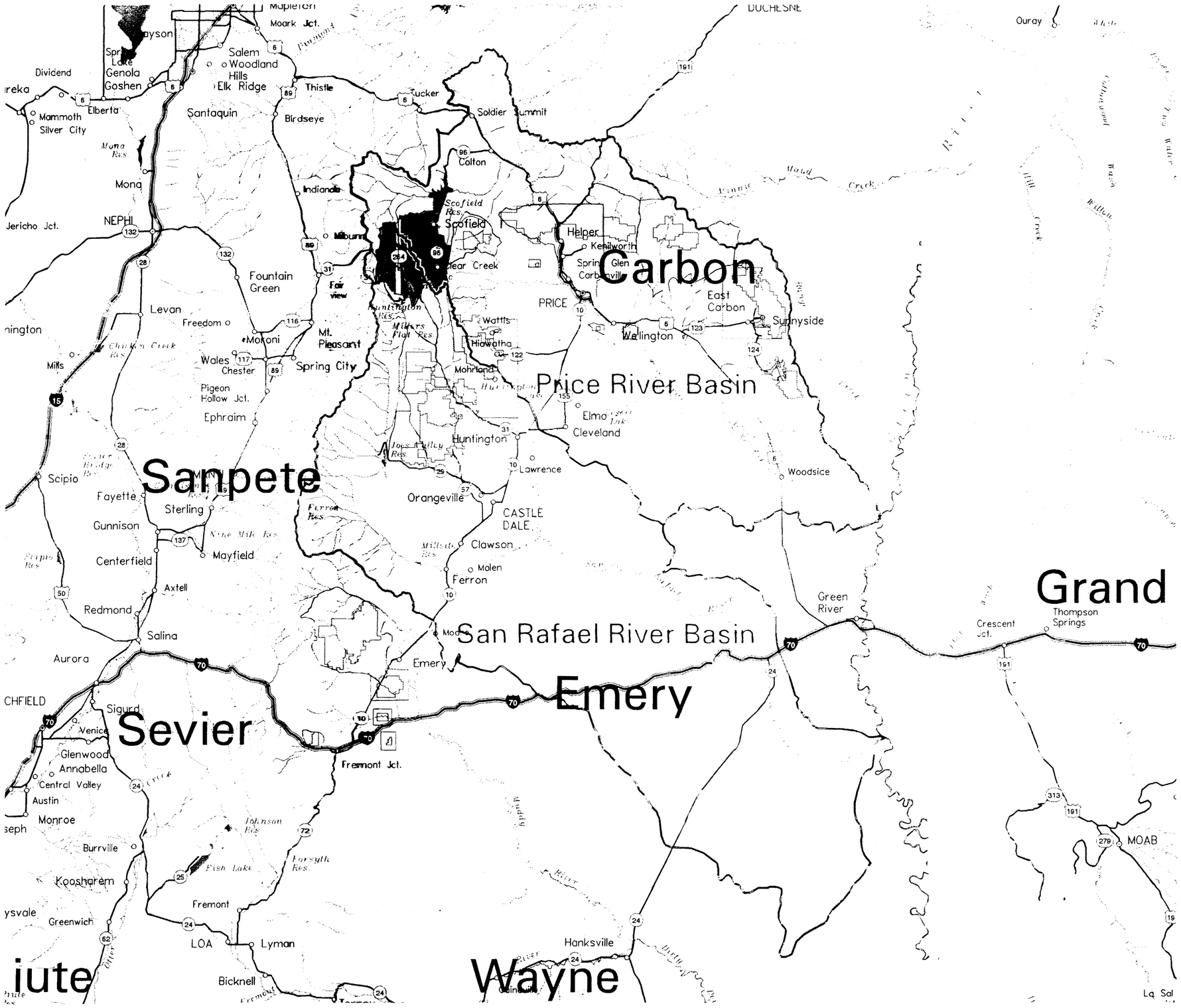

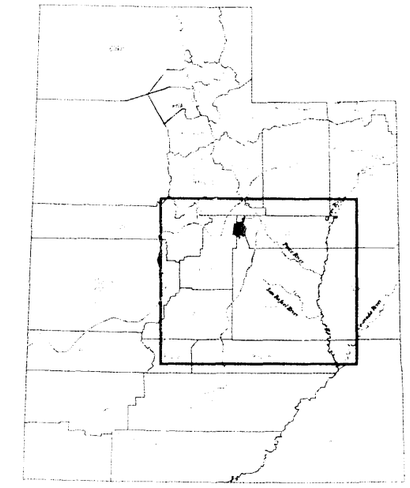

Location Map

- Mud Creek -Upper Huntington Creek Basin CIA Area
- Coal Fields
- Coal Permit Areas
- County Boundary
- CIA Areas
- Hydrologic Unit Boundary

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining

N

Cumulative Hydrologic Impact Assessment
Mud Creek - Upper Huntington Creek Basin

Figure 1
LOCATION MAP

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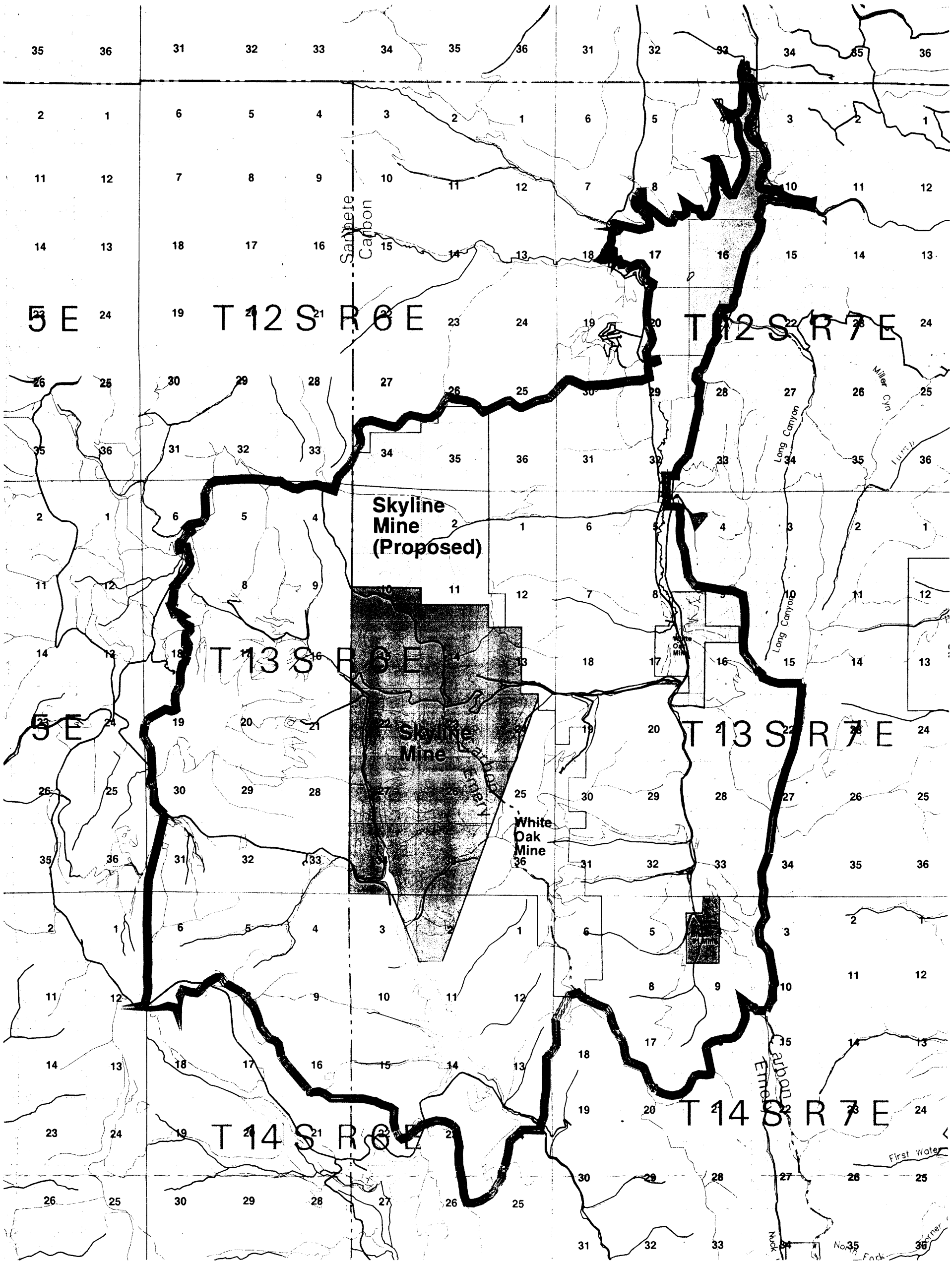
Compiled by: Dan Smith Date: Nov. 21, 2002



CIA Area

Intermittent Stream

Perennial Stream

Contours 200ft Interval

Main Road

Graded Dirt Road

Dirt Road

Cumulative Hydrologic Impact Assessment
Mud Creek - Upper Huntington Creek Basin

Figure 2
CUMULATIVE IMPACT AREA (CIA)

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Compiled by: Dan Smith Date: Nov. 21, 2002

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Department of Natural Resources
Division of Oil, Gas and Mining

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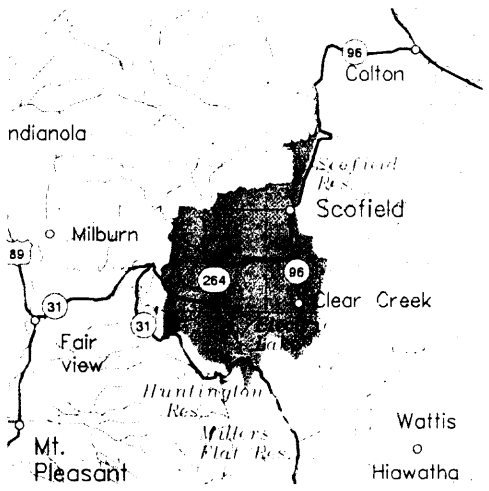

Location Map

Misc Quaternary deposits
Flagstaff Limestone
North Horn Fmn
Price River
Castlegate Sandstone
Blackhawk Formation
Star Point Sandstone
Mancos Shale
CIA Area
Faults
Dikes
Main Road

Cumulative Hydrologic Impact Assessment
Mud Creek - Upper Huntington Creek Basin

Figure 3
GEOLOGY

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Department of Natural Resources
Division of Oil, Gas and Mining

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Location Map

Skyline Mine (Proposed)

Skyline Mine

White Oak Mine

White Oak Mine

Blazon #1 Mine

S R 6 E

T 1

Connelville Fault

O'Conner Fault

Valentine Fault

Pleasant Valley Fault

8500

8400

8300

8200

Pre-SMCRA, Pre-1977 Mining

Streams

Major Faults

Dikes

Ground Monit.

Surface Water Monit. Site

UPDES Monit. Site

Cumulative Hydrologic Impact Assessment
Mud Creek - Upper Huntington Creek Basin

Figure 3a - Skyline Mine
Mining and Geology

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Compiled by: Dan Smith Date: Nov. 21, 2002

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Department of Natural Resources
Division of Oil, Gas and Mining

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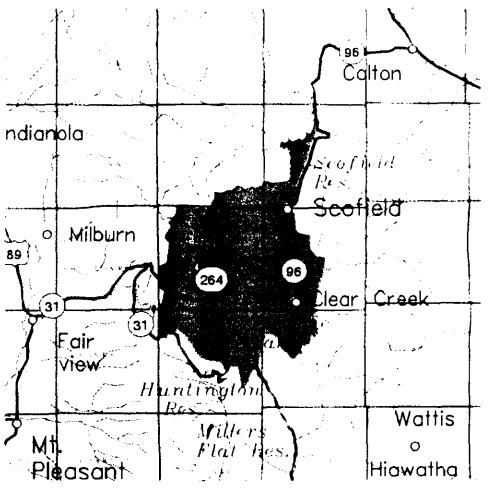
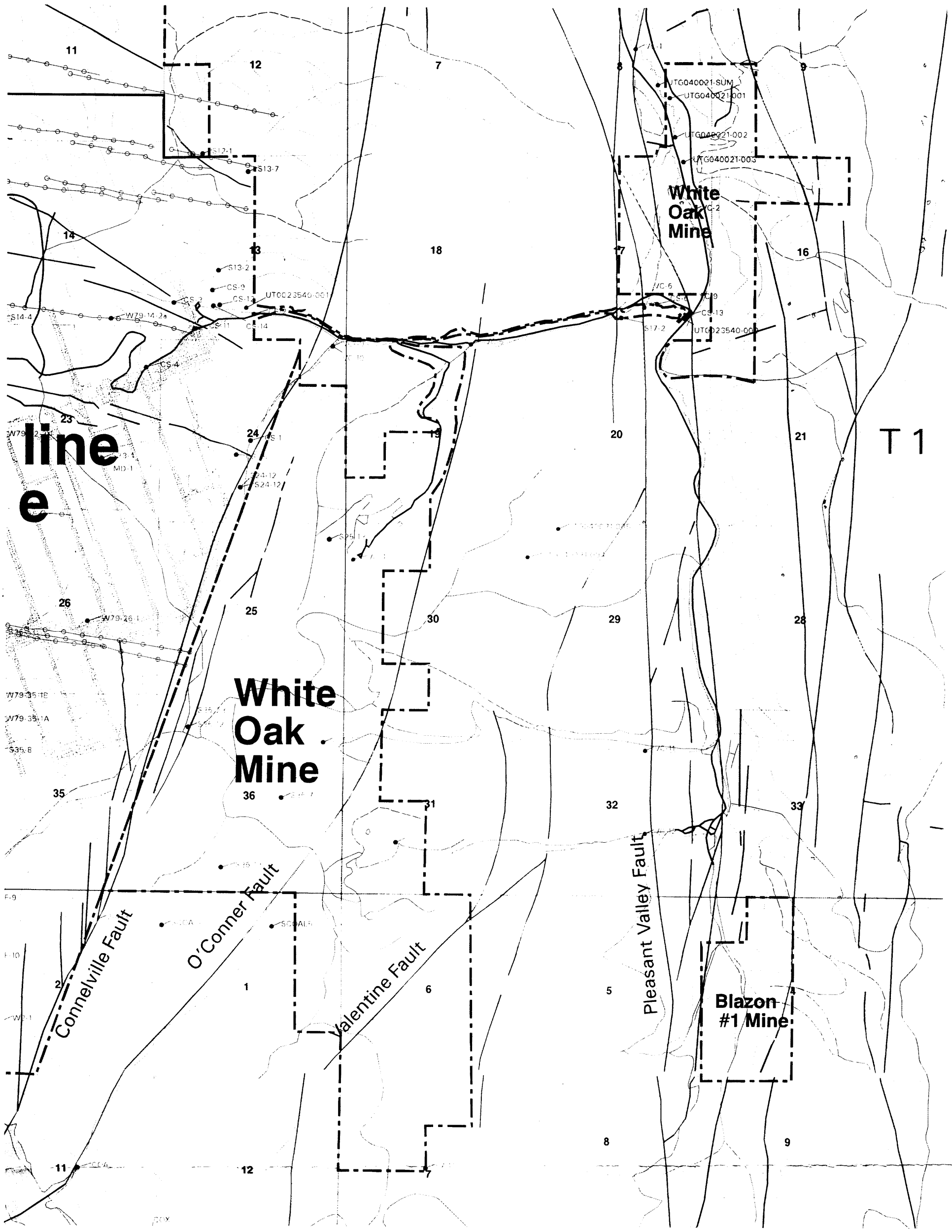


Location Map



Pre-SMCRA, Pre-1977 Mining
Streams
Major Faults
Dikes
Ground Monit.
Surface Water Monit. Site
UPDES Monit. Site

Cumulative Hydrologic Impact Assessment
Mud Creek - Upper Huntington Creek Basin

Figure 3b
White Oak and Blazon Mines
Mining and Geology

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Compiled by: Dan Smith Date: Nov. 21, 2002

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining

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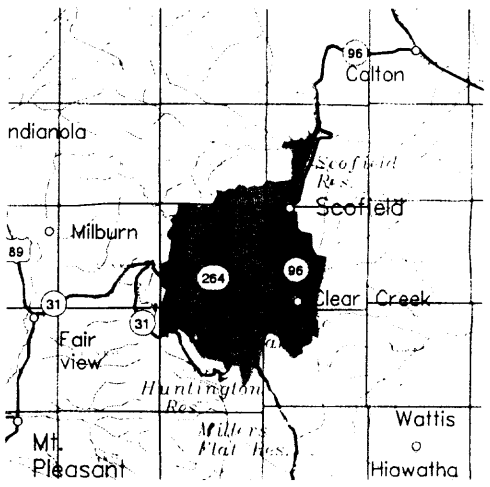
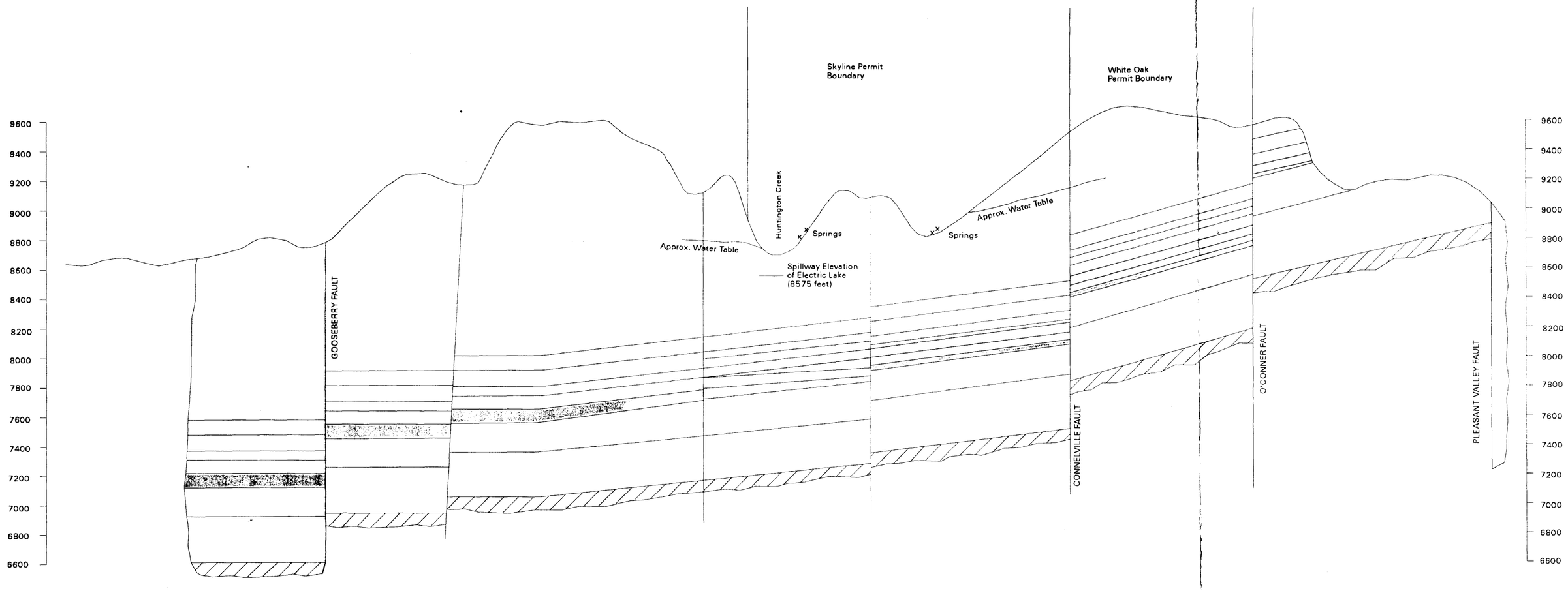


Location Map



Hydrogeologic Cross-Section

Storrs Sandstone | Panther Sandstone | Starpoint Sandstone | No Flow Boundary

Cumulative Hydrologic Impact Assessment
Mud Creek - Upper Huntington Creek Basin

Figure 4
HYDROGEOLOGIC CROSS-SECTION

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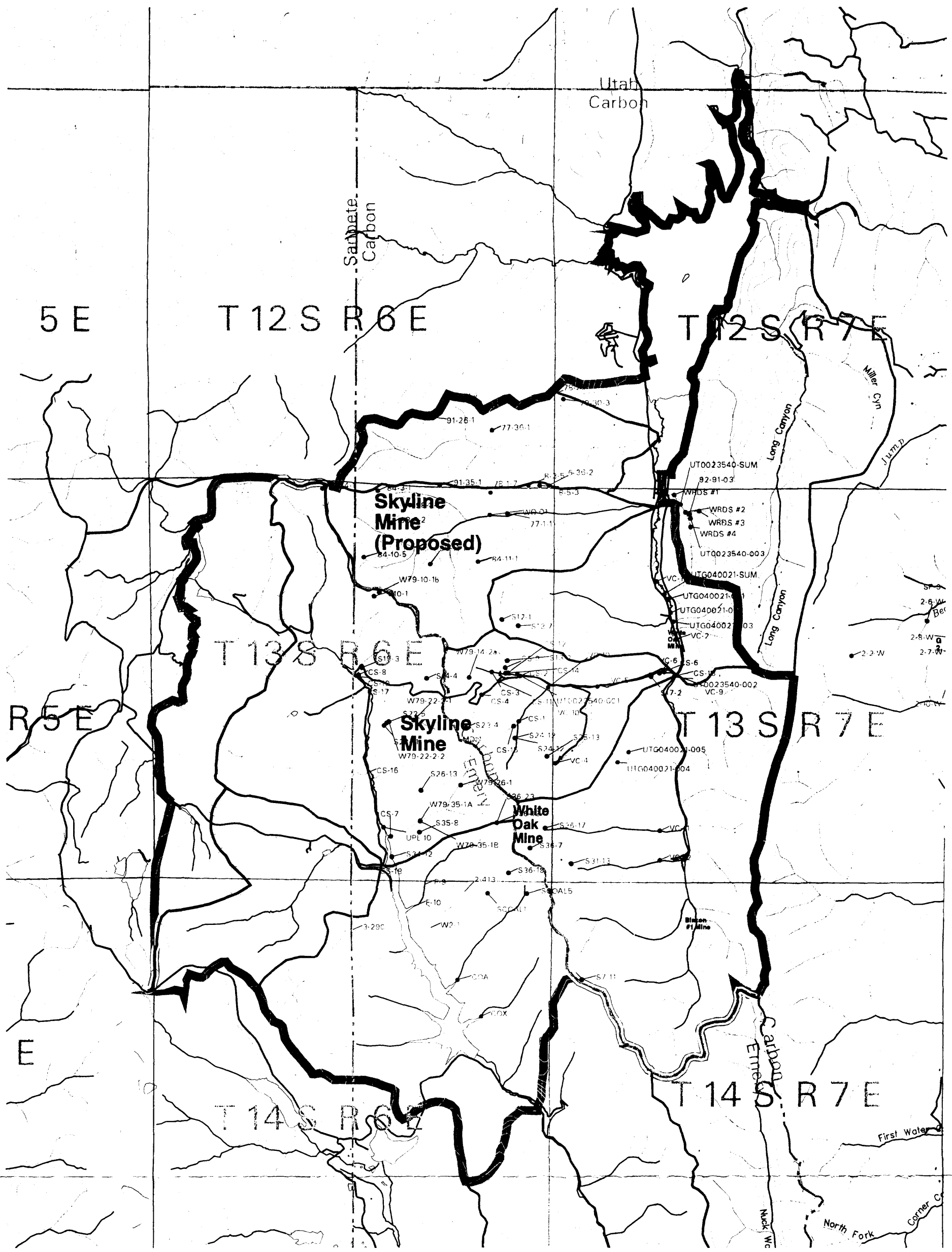
Compiled by: Dan Smith Date: Nov. 21, 2002



CIA Area

Intermittent Stream

Perennial Stream

Contours 200ft Interval

Main Road

Major River Basin

Hydro Sub-Basin

Ground Monit.

Surface Water Monit. Site

UPDES Monit. Site

Cumulative Hydrologic Impact Assessment
Mud Creek - Upper Huntington Creek Basin

SURFACE HYDROLOGY

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Compiled by: Dan Smith Date: November 06, 2002

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining

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FIGURE 6A

TDS in Lower Eccles Creek

CS-2, VC-6, CS-6, &VC-9 1981-2002

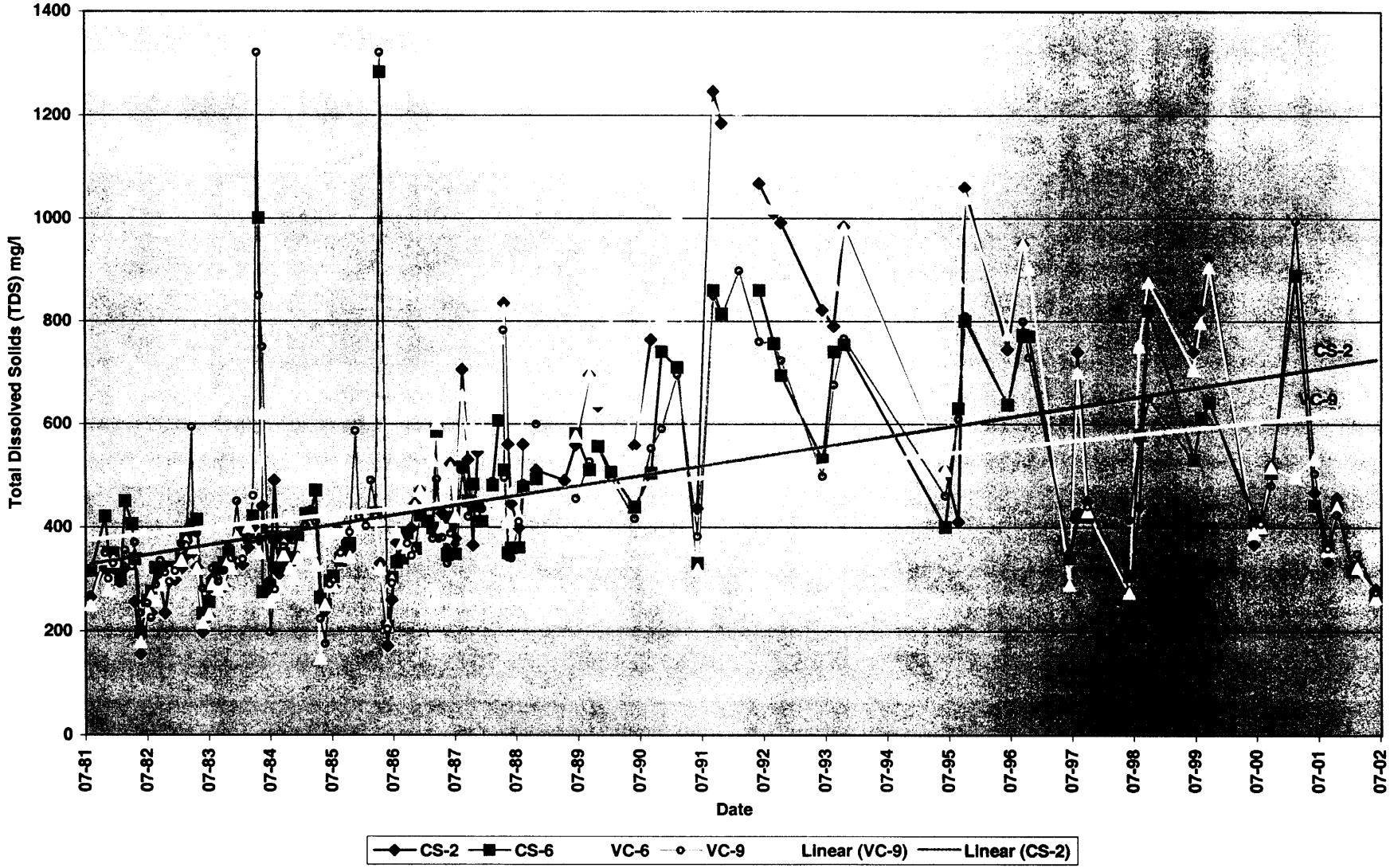


FIGURE 6B
TDS in Upper Eccles Creek
CS-3, CS-4, CS-9, &CS-11 1978-2002

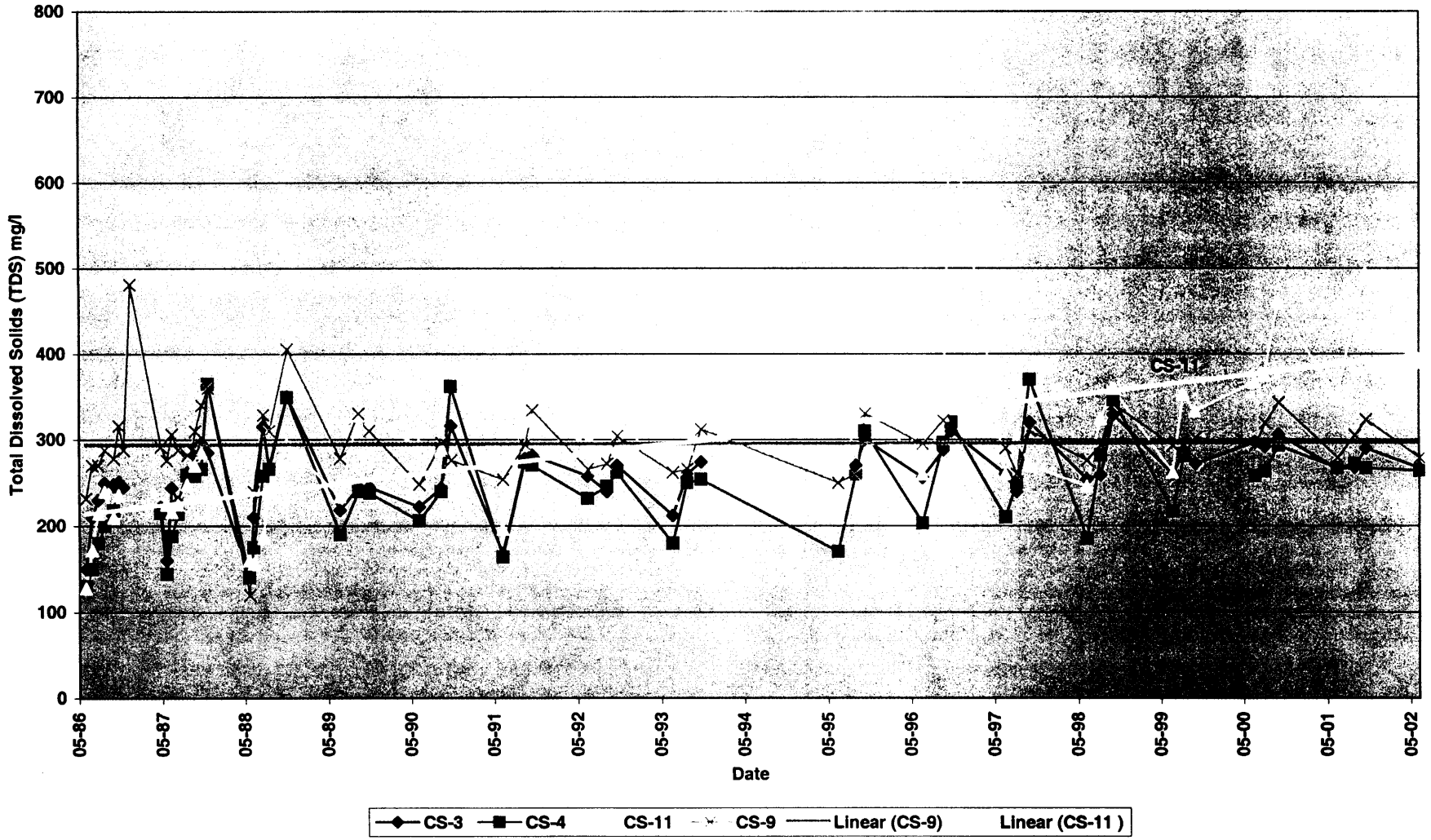


FIGURE 6C

TDS in South Fork of Eccles Creek

CS-1 & VC-10 1978-2002

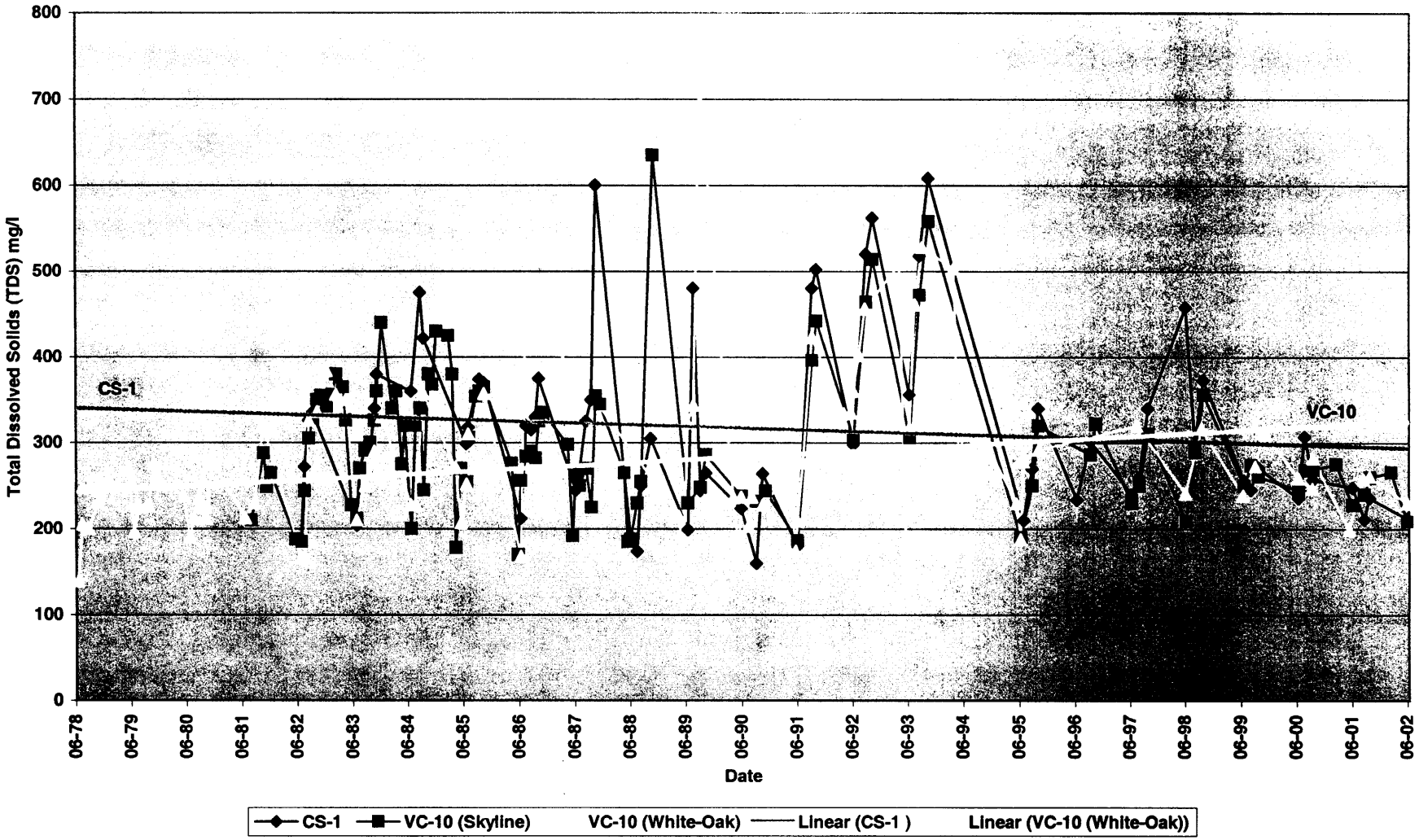


FIGURE 6D
TDS in Whiskey Creek
VC-4 & VC-5 1977-2001

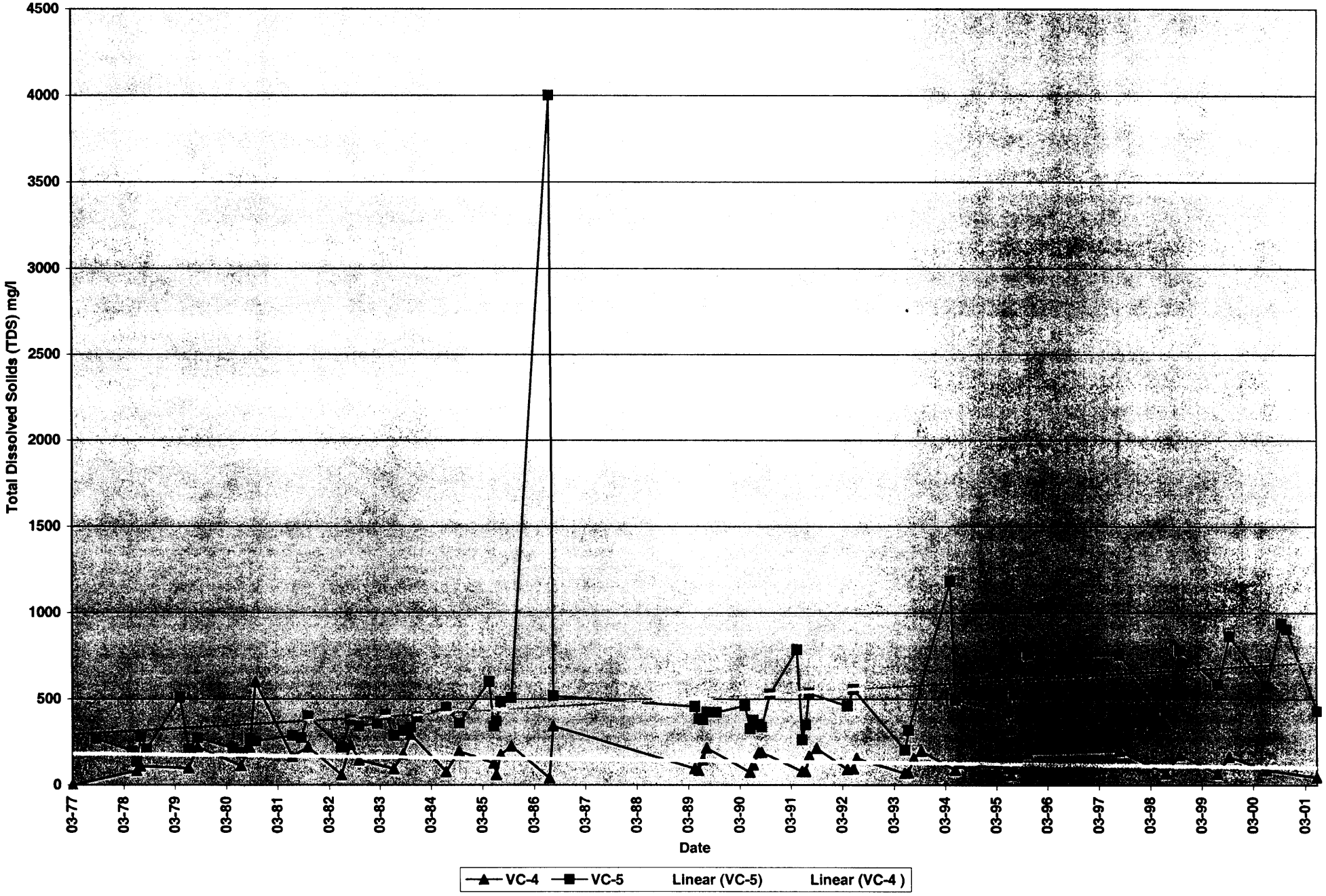


FIGURE 7

TDS in Mud Creek Below Eccles

VC-1 &VC-2 1977-2002

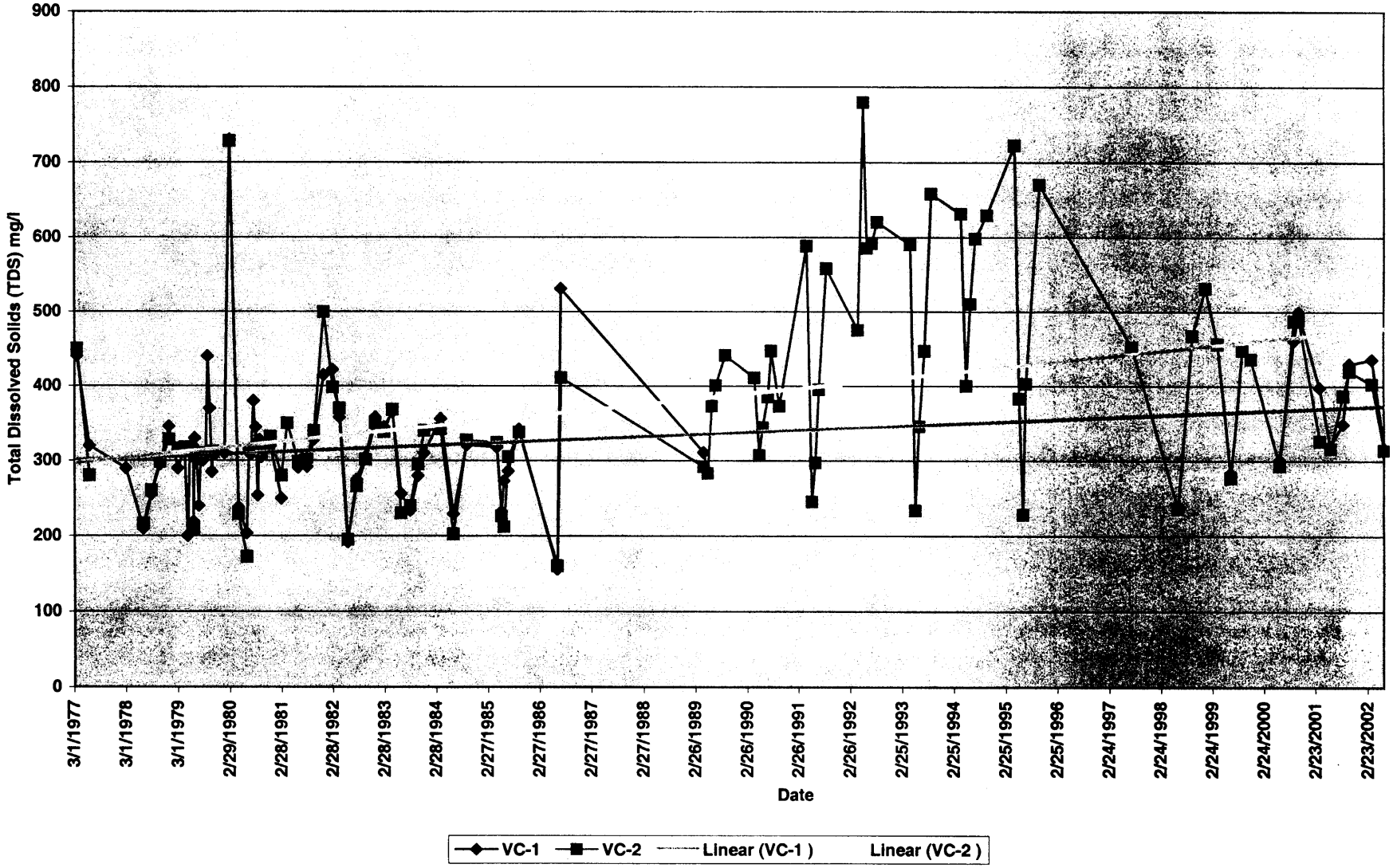
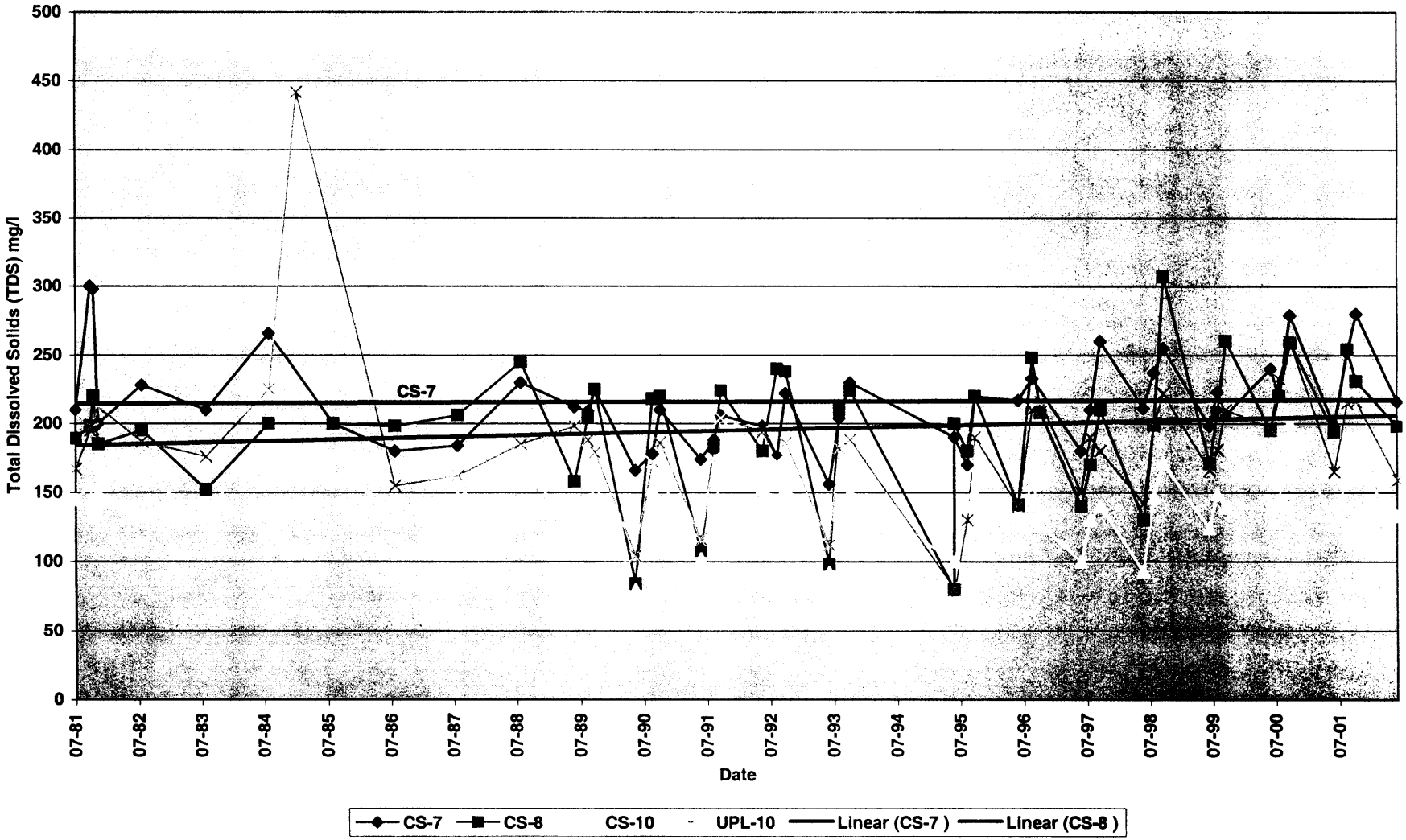


FIGURE 8
TDS in Upper Huntington Creek
CS-7, CS-8, CS-10 & UPL-10 1981-2002



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

Michael O. Leavitt
Governor

Robert L. Morgan
Executive Director

Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340 telephone
(801) 359-3940 fax
(801) 538-7223 TTY
www.nr.utah.gov

September 30, 2002

Dan Meadors, General Manager
Canyon Fuel Company, LLC.
HC 35 Box 380
Helper, Utah 84526

Re: North Lease (Winter Quarters) Permit Revision/Extension, Canyon Fuel Company, LLC., Skyline Mine, C/007/005-SR02I, Outgoing File

Dear Mr. Meadors:

The North Lease application to increase the permit area by 3243 acres has been determined Administratively Complete. However, further technical information should be submitted as identified on the attached Administrative Completeness Review (ACR) form. The requested information must be provided by close of business on Monday October 7, 2002 to be included in the first round of the Technical Analysis (TA). (Seven copies of the information should be provided.)

The Division expects to complete the first round TA by October 18, 2002. Canyon Fuel will have a second opportunity to respond to deficiencies in the TA on or before November 4, 2002. The projected date for final technical review is November 21, 2002.

In accordance with R645-301-121.100, Canyon Fuel Company may proceed with public notice of the North Lease Revision/Extension to the Permit. If you have any questions, please feel free to call Priscilla Burton at (801) 538-5288 or me at (801) 538-5325.

Sincerely,

Daron R. Haddock
Permit Supervisor

an
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Utah!
Where ideas connect

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)

ss.

County of Carbon,)

I, Ken Larson, on oath, say that I am the Publisher of the Sun Advocate, a twice-weekly newspaper of general circulation, published at Price, State a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) consecutive issues, and that the first publication was on the 3rd day of October, 2002, and that the last publication of such notice was in the issue of such newspaper dated the 24th day of October, 2002.

Ken G. Larson

Ken G Larson - Publisher

Subscribed and sworn to before me this 24th day of October, 2002.

Linda Thayn

Notary Public My commission expires January 10, 2003 Residing at Price, Utah

Publication fee, $ 752.64

LINDA THAYN
NOTARY PUBLIC - STATE of UTAH
[illegible] EAST MAIN
PRICE, UTAH 84501
COMM. EXP. 1-10-2003

PUBLIC NOTICE

Canyon Fuel Company, LLC, of Salt Lake City, Utah, has filed a complete application with the Division of Oil, Gas and Mining for a revision of the existing Mining and Reclamation Plan, C/007/005 for the Skyline Mines. The mines are located approximately 5 miles southwest of the town of Scofield, Utah. The revision includes the addition of acreage associated with Federal Coal Lease, Serial # UTU-67939 (North Lease). The North Lease is located in the vicinity of Winter Quarters Canyon. The addition of this area will increase the permit area and underground workings for the Skyline Mines by 3,243 acres, with no additional surface disturbance proposed. Upon approval, DOGM will issue a new permit for the entire permit area, including the extension area.

According to the Scofield, Utah, USGS 7.5 minute topographic map, the North Lease area location is defined as follows:

PROPOSED PERMIT EXTENSION AREA

Township 12 South, Range 6 East, SLBM
- Section 26, S2SE, SESW
- Section 34, Lots 1-4, S2NE, SENW, E2 SWNW, N2S2
- Section 35, All

Township 13 South, Range 6 East, SLBM
- Section 2, All
- Section 3, All
- Section 10, Lots 1-2, NE, E2NW
- Section 11, N2, N2S2

CURRENT PERMIT AREA

Township 13 South, Range 6 East, SLBM

Section 10:	Portion
Section 11:	Portion
Section 12:	Portion
Section 13:	Portion
Section 14:	All
Section 15:	All
Section 22:	All
Section 23:	All

Salt Lake City, Utah 84114

Carbon County Courthouse
120 East Main Street
Price, Utah 84501

The address of the applicant is: Canyon Fuel Company, LLC
6955 South Union Park Center, Suite 540
Midvale, Utah 84047
Phone: (801) 569-4700

Written comments or request for a hearing regarding this application must be submitted within 30 days of the last publication date of this notice, to the Utah Division of Oil, Gas and Mining, Attention Coal Regulatory Program, 1594 West North Temple, Suite 1210, Salt Lake City, Utah 84114-5801.

Published in the Sun Advocate October 3, 10, 17 and 24, 2002.

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)

ss.

County of Emery,)

I, Ken Larson, on oath, say that I am the Publisher of the Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) consecutive issues, and that the first publication was on the 8th day of October, 2002 and that the last publication of such notice was in the issue of such newspaper dated the 29thday of October, 2002.

Ken G. Larson

Ken G Larson - Publisher

Subscribed and sworn to before me this 29th day of October, 2002.

Linda Thayn

Notary Public My commission expires January 10, 2003 Residing at Price, Utah

Publication fee, $ 539.52

LINDA THAYN
NOTARY PUBLIC - STATE of UTAH
84 EAST MAIN
PRICE, UTAH 84501
COMM. EXP. 1-10-2003

PUBLIC NOTICE

Canyon Fuel Company, LLC, of Salt Lake City, Utah, has filed a complete application with the Division of Oil, Gas and Mining for a revision of the existing Mining and Reclamation Plan, C/007/005 for the Skyline Mines. The mines are located approximately 5 miles southwest of the town of Scofield, Utah. The revision includes the addition of acreage associated with Federal Coal Lease, Serial # UTU-67939 (North Lease). The North Lease is located in the vicinity of Winter Quarters Canyon. The addition of this area will increase the permit area and underground workings for the Skyline Mines by 3,243 acres, with no additional surface disturbance proposed. Upon approval, DOGM will issue a new permit for the entire permit area, including the extension area.

According to the Scofield, Utah USGS 7.5 minute topographic map, the North Lease area location is defined as follows:

PROPOSED PERMIT EXTENSION AREA

Township 12 South, Range 6 East, SLBM
Section 26, S2SE, SESW
Section 34, Lots 1-4, S2NE, SENW, E2 SWNW, N2S2
Section 35, All

Section 24: Portion
Section 25: Portion
Section 26: All
Section 27: All
Section 34: All
Section 35: Portion
Section 36: Portion

Township 13 South, Range 7 East, SLBM
Section 4: Portion
Section 5: Portion
Section 17: Portion
Section 18: Portion
Section 19: Portion

Township 14 South, Range 6 East, SLBM
Section 2: Portion
Section 3: Portion

A copy of the application will be available for inspection at the following locations:

Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114

Carbon County Courthouse
120 East Main Street
Price, Utah 84501

The address of the applicant is: Canyon Fuel Company, LLC
6955 South Union Park Center, Suite 540
Midvale, Utah 84047
Phone: (801) 569-4700

Written comments or request for a hearing regarding this application must be submitted within 30 days of the last publication date of this notice, to the Utah Division of Oil, Gas and Mining, Attention Coal Regulatory Program, 1594 West North Temple, Suite 1210, Salt Lake City, Utah 84114-5801.

Published in the Emery County Progress October 8, 15, 22 and 29, 2002.

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

Michael O. Leavitt
Governor

Robert L. Morgan
Executive Director

Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340 telephone
(801) 359-3940 fax
(801) 538-7223 TTY
www.nr.utah.gov

November 26, 2002

TO: Compliance File

FROM: Pamela Grubaugh-Littig, Permit Supervisor

RE: AVS Documentation, Canyon Fuel Company, LLC, Skyline Mine, C/007/005, Compliance File

As of the writing of this memo, there are no NOVs or COs which are not corrected or in the process of being corrected for the Skyline Mine. There are no finalized civil penalties, which are outstanding and overdue in the name of Canyon Fuel Company, LLC. Canyon Fuel Company, LLC does 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.

Attached is documentation from the OSM Applicant Violator System dated November 26, 2002.

O:\007005.SKY COMPLIANCE\AVSNORTHLEASE2002.DOC

Utah!
Where ideas connect

State : UT Permit No : ACT007005 Appl No : ACT007005

Permittee : 142816(CANYON FUEL CO LLC) Seqno : 2

Applicant : 142816(CANYON FUEL CO LLC)

OSMRE: Comments/Analysis: Date : 26-Nov-2002 Mode : UPDATE

There were no violaitons retrieved by the system. be

SRA: Comments/Analysis: Date : Mode : VIEW

SAVE(F5) DELETE(F8)

PRV_SCR(F3) QUIT(F4) CHOICES(F10)

Please copy to:
LDB
~~MAW~~ → Pam
Ref. to Ron.

ACT/007/005
#2

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155

AUG 5 1996

IN REPLY REFER TO
3425
UTU-67939
(UT-932)

CERTIFIED Mail--Return Receipt Requested

DECISION

Coastal States Energy Company	:	Coal Lease
175 East 400 South, Suite 800	:	UTU-67939
Salt Lake City, Utah 84111	:	

Lease Issued
Bond Accepted

Pursuant to the lease by application sale held May 30, 1996, the bid of Coastal States Energy Company for the Winter Quarters Tract, assigned serial no. UTU-67939, was determined to be the acceptable high bid. Satisfactory evidence of the qualifications and holdings of Coastal States Energy Company is on file; therefore, coal lease UTU-67939 is hereby issued effective September 1, 1996.

A surety bond of $4,490,000 was filed in this office August 2, 1996. The name of the surety is United Pacific Insurance Company, and the surety bond no. is U2644533. The bond is hereby accepted, as of September 1, 1996.

Christopher J. Merritt

Acting Group Leader,
Minerals Adjudication Group

Enclosure
Coal Lease UTU-67939

bc: Resource Development Coordinating Committee w/encl.
MMS, Solid Minerals Staff, Denver, Co w/encl.
Price Coal Office w/encl.
U.S. Forest Service, Ogden, UT w/encl.
Manti-LaSal National Forest w/encl.
Moab District Office

CMERRITT.08/05/96.67939ISS

Form 3400-12
(April 1986)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial Number

UTU-67939

COAL LEASE

PART I. LEASE RIGHTS GRANTED

This lease, entered into by and between the UNITED STATES OF AMERICA, hereinafter called lessor, through the Bureau of Land Management, and *(Name and Address)*

Coastal States Energy Company
175 East 400 South, Suite 800
Salt Lake City, UT 84111

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hereinafter called lessee, is effective *(date)* SEP 1 1996, for a period of 20 years and for so long thereafter as coal is produced in commercial quantities from the leased lands, subject to readjustment of lease terms at the end of the 20th lease year and each 10-year period thereafter.

Sec. 1. This lease is issued pursuant and subject to the terms and provisions of the:

☒ Mineral Lands Leasing Act of 1920, Act of February 25, 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

☐ Mineral Leasing Act for Acquired Lands, Act of August 7, 1947, 61 Stat. 913, 30 U.S.C. 351-359;

and to the regulations and formal orders of the Secretary of the Interior which are now or hereafter in force, when not inconsistent with the express and specific provisions herein.

Sec. 2. Lessor, in consideration of any bonuses, rents, and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants and leases to lessee the exclusive right and privilege to drill for, mine, extract, remove, or otherwise process and dispose of the coal deposits in, upon, or under the following described lands:

T. 12 S., R. 6 E., SLM, Utah
Sec. 26, S2SE, SESW;
Sec. 34, lots 1-4, S2NE, SENW, E2SWNW, N2S2;
Sec. 35, all.
T. 13 S., R. 6 E., SLM, Utah
Sec. 2, all;
Sec. 3, all;
Sec. 10, lots 1-2, NE, E2NW;
Sec. 11, N2, N2S2.

containing 3,291.00 acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and the right to use such on-lease rights-of-way which may be necessary and convenient in the exercise of the rights and privileges granted, subject to the conditions herein provided.

PART II. TERMS AND CONDITIONS

Sec. 1. (a) RENTAL RATE - Lessee shall pay lessor rental annually and in advance for each acre or fraction thereof during the continuance of the lease at the rate of $3.00/acre for each lease year.

(b) RENTAL CREDITS - Rental shall not be credited against either production or advance royalties for any year.

Sec. 2. (a) PRODUCTION ROYALTIES - The royalty shall be 8 percent of the value of the coal as set forth in the regulations. Royalties are due to lessor the final day of the month succeeding the calendar month in which the royalty obligation accrues.

(b) ADVANCE ROYALTIES - Upon request by the lessee, the authorized officer may accept, for a total of not more than 10 years, the payment of advance royalties in lieu of continued operation, consistent with the regulations. The advance royalty shall be based on a percent of the value of a minimum number of tons determined in the manner established by the advance royalty regulations in effect at the time the lessee requests approval to pay advance royalties in lieu of continued operation.

Sec. 3. BONDS - Lessee shall maintain in the proper office a lease bond in the amount of $4,490,000. The authorized officer may require an increase in this amount when additional coverage is determined appropriate.

Sec. 4. DILIGENCE - This lease is subject to the conditions of diligent development and continued operation, except that these conditions are excused when operations under the lease are interrupted by strikes, the elements, or casualties not attributable to the lessee. The lessor, in the public interest, may suspend the condition of continued operation upon payment of advance royalties in accordance with the regulations in existence at the time of the suspension. Lessee's failure to produce coal in commercial quantities at the end of 10 years shall terminate the lease. Lessee shall submit an operation and reclamation plan pursuant to Section 7 of the Act not later than 3 years after lease issuance.

The lessor reserves the power to assent to or order the suspension of the terms and conditions of this lease in accordance with, inter alia, Section 39 of the Mineral Leasing Act, 30 U.S.C. 209.

Sec. 5. LOGICAL MINING UNIT (LMU) - Either upon approval by the lessor of the lessee's application or at the direction of the lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

The stipulations established in an LMU approval in effect at the time of LMU approval will supersede the relevant inconsistent terms of this lease so long as the lease remains committed to the LMU. If the LMU of which this lease is a part is dissolved, the lease shall then be subject to the lease terms which would have been applied if the lease had not been included in an LMU.

Sec. 6. DOCUMENTS, EVIDENCE AND INSPECTION - At such times and in such form as lessor may prescribe, lessee shall furnish detailed statements showing the amounts and quality of all products removed and sold from the lease, the proceeds therefrom, and the amount used for production purposes or unavoidably lost.

Lessee shall keep open at all reasonable times for the inspection of any duly authorized officer of lessor, the leased premises and all surface and underground improvements, works, machinery, ore stockpiles, equipment, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or under the leased lands.

Lessee shall allow lessor access to and copying of documents reasonably necessary to verify lessee compliance with terms and conditions of the lease.

While this lease remains in effect, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Sec. 7. DAMAGES TO PROPERTY AND CONDUCT OF OPERATIONS - Lessee shall comply at its own expense with all reasonable orders of the Secretary, respecting diligent operations, prevention of waste, and protection of other resources.

Lessee shall not conduct exploration operations, other than casual use, without an approved exploration plan. All exploration plans prior to the commencement of mining operations within an approved mining permit area shall be submitted to the authorized officer.

Lessee shall carry on all operations in accordance with approved methods and practices as provided in the operating regulations, having due regard for the prevention of injury to life, health, or property, and prevention of waste, damage or degradation to any land, air, water, cultural, biological, visual, and other resources, including mineral deposits and formations of mineral deposits not leased hereunder, and to other land uses or users. Lessee shall take measures deemed necessary by lessor to accomplish the intent of this lease term. Such measures may include, but are not limited to, modification to proposed siting or design of facilities, timing of operations, and specification of interim and final reclamation procedures. Lessor reserves to itself the right to lease, sell, or otherwise dispose of the surface or other mineral deposits in the lands and the right to continue existing uses and to authorize future uses upon or in the leased lands, including issuing leases for mineral deposits not covered hereunder and approving easements or rights-of-way. Lessor shall condition such uses to prevent unnecessary or unreasonable interference with rights of lessee as may be consistent with concepts of multiple use and multiple mineral development.

Sec. 8. PROTECTION OF DIVERSE INTERESTS, AND EQUAL OPPORTUNITY - Lessee shall: pay when due all taxes legally assessed and levied under the laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at lease twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; restrict the workday to not more than 8 hours in any one day for underground workers, except in emergencies; and take measures necessary to protect the health and safety of the public. No person under the age of 16 years shall be employed in any mine below the surface. To the extent that laws of the State in which the lands are situated are more restrictive than the provisions in this paragraph, then the State laws apply.

Lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor. Neither lessee nor lessee's subcontractors shall maintain segregated facilities.

Sec. 9. (a) TRANSFERS

- [x] This lease may be transferred in whole or in part to any person, association or corporation qualified to hold such lease interest.
- [ ] This lease may be transferred in whole or in part to another public body or to a person who will mine the coal on behalf of, and for the use of, the public body or to a person who for the limited purpose of creating a security interest in favor of a lender agrees to be obligated to mine the coal on behalf of the public body.
- [ ] This lease may only be transferred in whole or in part to another small business qualified under 13 CFR 121.

Transfers of record title, working or royalty interest *must* be approved in accordance with the regulations.

(b) RELINQUISHMENT - The lessee may relinquish in writing at any time all rights under this lease or any portion thereof as provided in the regulations. Upon lessor's acceptance of the relinquishment, lessee shall be relieved of all future obligations under the lease or the relinquished portion thereof, whichever is applicable.

Sec. 10. DELIVERY OF PREMISES, REMOVAL OF MACHINERY, EQUIPMENT, ETC. - At such time as all portions of this lease are returned to lessor, lessee shall deliver up to lessor the land leased, underground timbering, and such other supports and structures necessary for the preservation of the mine workings on the leased premises or deposits and place all workings in condition for suspension or abandonment. Within 180 days thereof, lessee shall remove from the premises all other structures, machinery, equipment, tools, and materials that it elects to or as required by the authorized officer. Any such structures, machinery, equipment, tools, and materials remaining on the leased lands beyond 180 days, or approved extension thereof, shall become the property of the lessor, but lessee shall either remove any or all such property or shall continue to be liable for the cost of removal and disposal in the amount actually incurred by the lessor. If the surface is owned by third parties, lessor shall waive the requirement for removal, provided the third parties do not object to such waiver. Lessee shall, prior to the termination of bond liability or at any other time when required and in accordance with all applicable laws and regulations, reclaim all lands the surface of which has been disturbed, dispose of all debris or solid waste, repair the offsite and onsite damage caused by lessee's activity or activities incidental thereto, and reclaim access roads or trails.

Sec. 11. PROCEEDINGS IN CASE OF DEFAULT - If lessee fails to comply with applicable laws, existing regulations, or the terms, conditions and stipulations of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation by the lessor only by judicial proceedings. This provision shall not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occurring at any other time.

Sec. 12. HEIRS AND SUCCESSORS-IN-INTEREST - Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

Sec. 13. INDEMNIFICATION - Lessee shall indemnify and hold harmless the United States from any and all claims arising out of the lessee's activities and operations under this lease.

Sec. 14. SPECIAL STATUTES - This lease is subject to the Clean Water Act (33 U.S.C. 1252 et. seq.), the Clean Air Act (42 U.S.C. 4274 et. seq.), and to all other applicable laws pertaining to exploration activities, mining operations and reclamation, including the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et. seq.).

Sec. 15. SPECIAL STIPULATIONS -

This coal lease is subject to termination if the lessee is determined at the time of issuance to be in noncompliance with Section 2(a)2(A) of the Mineral Leasing Act.

Sec. 15. SPECIAL STIPULATIONS (Cont'd.) -

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SEE ATTACHED STIPULATIONS

THE UNITED STATES OF AMERICA

Coastal States Energy Company
Company or Lessee Name

(Signature of Lessee)

Senior Vice President
(Title)

August 1, 1996
(Date)

By Bureau of Land Management

(Signing Officer)

Acting
Group Leader, Minerals Adjudication Group
(Title)

August 5, 1996
(Date)

18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

This form does not constitute an information collection as defined by 44 U.S.C. 3502 and therefore does not require OMB approval.

1. The Regulatory Authority shall mean the State Regulatory Authority pursuant to a cooperative agreement approved under 30 CFR Part 745 or in the absence of a cooperative agreement, Office of Surface Mining. The authorized officer shall mean the State Director, Bureau of Land Management. The authorized officer of the Surface Management Agency shall mean the Forest Supervisor, Forest Service. Surface Management Agency for private surface is the Bureau of Land Management. For adjoining private lands with Federal minerals and which primarily involve National Forest Service issues, the Forest Service will have the lead for environmental analysis and, when necessary, documentation in an environmental assessment or environmental impact statement.

2. The authorized officers, of the Bureau of Land Management, Office of Surface Mining (Regulatory Authority), and the Surface Management Agency (Forest Service) respectively, shall coordinate, as practical, regulation of mining operations and associated activities on the lease area.

3. In accordance with Sec. 523(b) of the "Surface Mining Control and Reclamation Act of 1977," surface mining and reclamation operations conducted on this lease are to conform with the requirements of this Act and are subject to compliance with Office of Surface Mining Regulations, or as applicable, a Utah program equivalent approved under cooperative agreement in accordance with Sec. 523(c). The United States Government does not warrant that the entire tract will be susceptible to mining.

4. Federal Regulations 43 CFR 3400 pertaining to Coal Management make provisions for the Surface Management Agency, the surface of which is under the jurisdiction of any Federal agency other than the Department of Interior, to consent to leasing and to prescribe conditions to insure the use and protection of the lands. All or part of this lease contain lands the surface of which are managed by the United States Department of Agriculture, Forest Service Manti-LaSal National Forest.

The following stipulations pertain to the lessee responsibility for mining operations on the lease area and on adjacent areas as may be specifically designated on National Forest System lands.

5. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory and a paleontological appraisal of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists or qualified paleontologists, as appropriate, and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified cultural or paleontological resources.

If cultural resources or paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the lessee prior to disturbance shall, immediately bring them to the attention of the appropriate authorities. Paleontological remains of significant scientific interest do not include leaves, ferns, or dinosaur tracks commonly encountered during underground mining operations.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the lessee.

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6. If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory bird species of high Federal interest occur in the area the lessee shall be required to conduct an intensive field inventory of the area to be disturbed and/or impacted. The inventory shall be conducted by a qualified specialist and a report of findings will be prepared. A plan will be prepared making recommendations for the protection of these species or action necessary to mitigate the disturbance.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the lessee.

7. The lessee shall be required to perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. Existing data may be used if such data is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

8. Powerlines used in conjunction with the mining of coal from this lease shall be constructed so as to provide adequate protection for raptors and other large birds. When feasible, powerlines will be located at least 100 yards from public roads.

9. The limited area available for mine facilities at the coal outcrop, steep topography, adverse winter weather, and physical limitations on the size and design of the access road, are factors which will determine the ultimate size of the surface area utilized for the mine. A site specific environmental analysis will be prepared for each new mine site development and for major modifications to existing developments to examine alternatives and mitigate conflicts.

10. Consideration will be given to site selection to reduce adverse visual impacts. Where alternative sites are available, and each alternative is technically feasible, the alternative involving the least damage to the scenery and other resources shall be selected. Permanent structures and facilities will be designed, and screening techniques employed, to reduce visual impacts, and where possible achieve a final landscape compatible with the natural surroundings. The creation of unusual, objectionable, or unnatural land forms and vegetative landscape features will be avoided.

11. The lessee shall be required to establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data.

12. The lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal handling and storage facilities. On Forest Development Roads (FDR), lessees may perform their share of road maintenance by a commensurate share agreement if a significant degree of traffic is generated that is not related to their activities.

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13. Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to existing surface structures, or (3) damage or alter the flow of perennial streams. The lessee shall provide specific measures for the protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created.

14. In order to avoid surface disturbance on steep canyon slopes and to preclude the need for surface access, all surface breakouts for ventilation tunnels shall be constructed from inside the mine, except at specifically approved locations.

15. If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with the regulations of the surface management agency.

16. The coal contained within, and authorized for mining under this lease, shall be extracted only by underground mining methods.

17. Existing Forest Service owned or permitted surface improvements will need to be protected, restored, or replaced to provide for the continuance of current land uses.

18. In order to protect big game wintering areas, elk calving and deer fawning areas, sagegrouse strutting areas, and other critical wildlife habitat and/or activities, specific surface uses outside the mine development area may be curtailed during specific periods of the year.

19. Support facilities, structures, equipment, and similar developments will be removed from the lease area within 2 years after the final termination of use of such facilities. This provision shall apply unless the requirement of Section 10 of the lease form is applicable. Disturbed areas and those areas previously occupied by such facilities will be stabilized and rehabilitated, drainages re-established, and the areas returned to a premining land use.

20. The lessee at the conclusion of the mining operations, or at other times as surface disturbance related to mining may occur, will replace all damaged, disturbed, or displaced corner monuments (section corners, quarter corners, etc.) their accessories and appendages (witness trees, bearing trees, etc.), or restore them to their original condition and location, or at other locations that meet the requirements of the rectangular surveying system. This work shall be conducted at the expense of the lessee, by a professional land surveyor registered in the State of Utah and to the standards and guidelines found in the Manual of Surveying Instructions, U.S. Department of Interior.

21. The lessee at his expense will be responsible to replace any surface water identified for protection, that may be lost or adversely affected by mining operations, with water from an alternate source in sufficient quantity and quality to maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses.

22. The lessee must comply with all the rules and regulations of the Secretary of Agriculture set forth at Title 36, Chapter II, of the Code of Federal Regulations governing the use and management of the National Forest System (NFS) when not inconsistent with the rights granted by the Secretary of the

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Interior in the lease. The Secretary of Agriculture's rules and regulations must be complied with for (1) all use and occupancy of the NFS prior to approval of a permit/operation plan by the Secretary of Interior, (2) uses of all existing improvements, such as Forest Development Roads, within and outside the area licensed, permitted or leased by the Secretary of Interior, and (3) use and occupancy of the NFS not authorized by a permit/operation plan approved by the Secretary of the Interior.

All matters related to this stipulation are to be addressed to:

Forest Supervisor
Manti-LaSal National Forest
599 West Price River Drive
Price, Utah 84501

Telephone No.: 801-637-2817

who is the authorized representative of the Secretary of Agriculture.

23. The lessee shall be required to pay the value of the royalty on coal left unmined without the authorized officer (AO) approval, which should have been recovered under the approval of a mine plan (Resource Recovery and Protection Plan, [R2P2] and which would otherwise be lost or left economically inaccessible.

24. The unleased coal in this tract is included in the Utah Schools and Lands Improvement Act of 1993 (Public Law 103-93) as a Federal interest which the State of Utah may select to satisfy the value of the exchange of State for Federal lands authorized in the Act. In accordance with the Act, the Federal interest, i.e., the unleased coal, in this tract was offered to the State of Utah on October 20, 1993. Consummation of the exchange under the Act may, in the future, allow for the State of Utah to succeed to some or all of the United States interest in the tract.

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155

IN REPLY REFER TO:
3482
UTU-67939
(UT-070)

CERTIFIED MAIL--Return Receipt Requested
Certification No:

NOV 27 2002

Ms. Mary Ann Wright
Director of Mining
Utah Division of Oil, Gas and Mining
1594 West North Temple Street, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Re: Canyon Fuel Company (CFC), Skyline Mine, Resource Recovery and Protection Plan (R2P2), Federal Coal Lease UTU-67939, Lower O'Connor "A"/Flat Canyon Seam, November, 2002

Dear Ms. Wright:

Canyon Fuel Company, LLC (CFC) has requested that Federal lease UTU-67939 is incorporated into the Skyline Mine Mining and Reclamation Plan (MRP) for the Skyline Permit Application Package (PAP). The Bureau of Land Management has reviewed the subject revised R2P2 (as of this date) as part of the PAP for the Skyline Mine. The submitted R2P2, with conditions of Approval, (see Enclosure) is in compliance with the Mineral Leasing Act of 1920, as amended, the lease terms and conditions, the regulations at 43 CFR 3480, and will achieve maximum economic recovery of the Federal coal. We recommend that the Secretary of Interior approve the R2P2 as part of the Federal Mine Plan Approval.

This approval is based upon implementation of the lease "Attached" Stipulation #13 which reads,

> Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment and landslides, (2) cause damage to existing surface structures, and (3) damage or alter the flow of perennial streams. The Lessee shall provide specific measure for protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created.

There are no escarpments or potential for landslides identified in this area. There are no surface structures that could be damaged. The Environmental Assessment for the Winter Quarters Tract for Coal Lease UTU-67939, states that mining that would cause subsidence of the perennial portions of Winter Quarters and Woods Canyon drainage can be approved by the regulatory agencies based on studies of the effects to the perennial drainages. The results of a study in Burnout Canyon at the Skyline Mine initiated in 1992 would form the basis for such decisions. (See attachment A, from the Environmental Assessment defining the perennial portions of the Winter Quarters and Woods Canyon drainages.)

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The past Burnout Creek evaluation where the drainage was undermined completely for much of the stream length, showed effects of undermining the stream were minor and mostly temporary. This is summarized in the following abstract of the evaluation by Sidle, R.C., I. Kamil, A. Sharma, and S. Yamashita, Stream response to subsidence from underground coal mining in Central Utah, Environmental Geology, 39 (3-4), 279-291, 2000:

> **Abstract** Short-term geomorphic and hydrologic effects of subsidence induced by longwall mining under Burnout Creek, Utah were evaluated. During the year after longwall mining, 0.3-1.5 m of subsidence was measured near impacted reaches of the mountain stream channel. The major channel changes that occurred in a 700-m reach of Burnout Creek that was subsided from 1992 to 1993 were: (1) increase in lengths of cascades and to a lesser extent glides; (2) increases in pool length, numbers and volumes; (3) increase in median particle diameter of bed sediment in pools; and (4) some constriction in channel geometry. Most of the changes appeared short-lived, with channel recovery approaching pre-mining conditions by 1994. In a 300-m reach of the South Fork that was subsided from 1993 to 1994, only channel constriction was observed, although any impacts on pool morphology may have been confounded by heavy grazing in the riparian reaches during the dry summer of 1994. Similar near-channel sedimentation and loss of pool volume between 1993 and 1994 were noted throughout Burnout Creek and in adjacent, unmined James Creek. Subsidence during the 3-year period had no effect on baseflows or near-channel landslides.

Therefore, BLM has determined that the proposed R2P2 meets Maximum Economic Recovery requirements as provided by the Mineral Leasing Act of 1920, as amended. There are no escarpments, landslide areas or surface structures that will be impacted. The Burnout Creek Study provides the required basis necessary to allow mining as per lease contract stipulation #13 under the perennial drainages as specified in the Environmental Assessment.

If you have any comments or questions, please contact George Tetreault at the Price Field Office at 435-636-3600 or Stan Perkes at 801-539-4036.

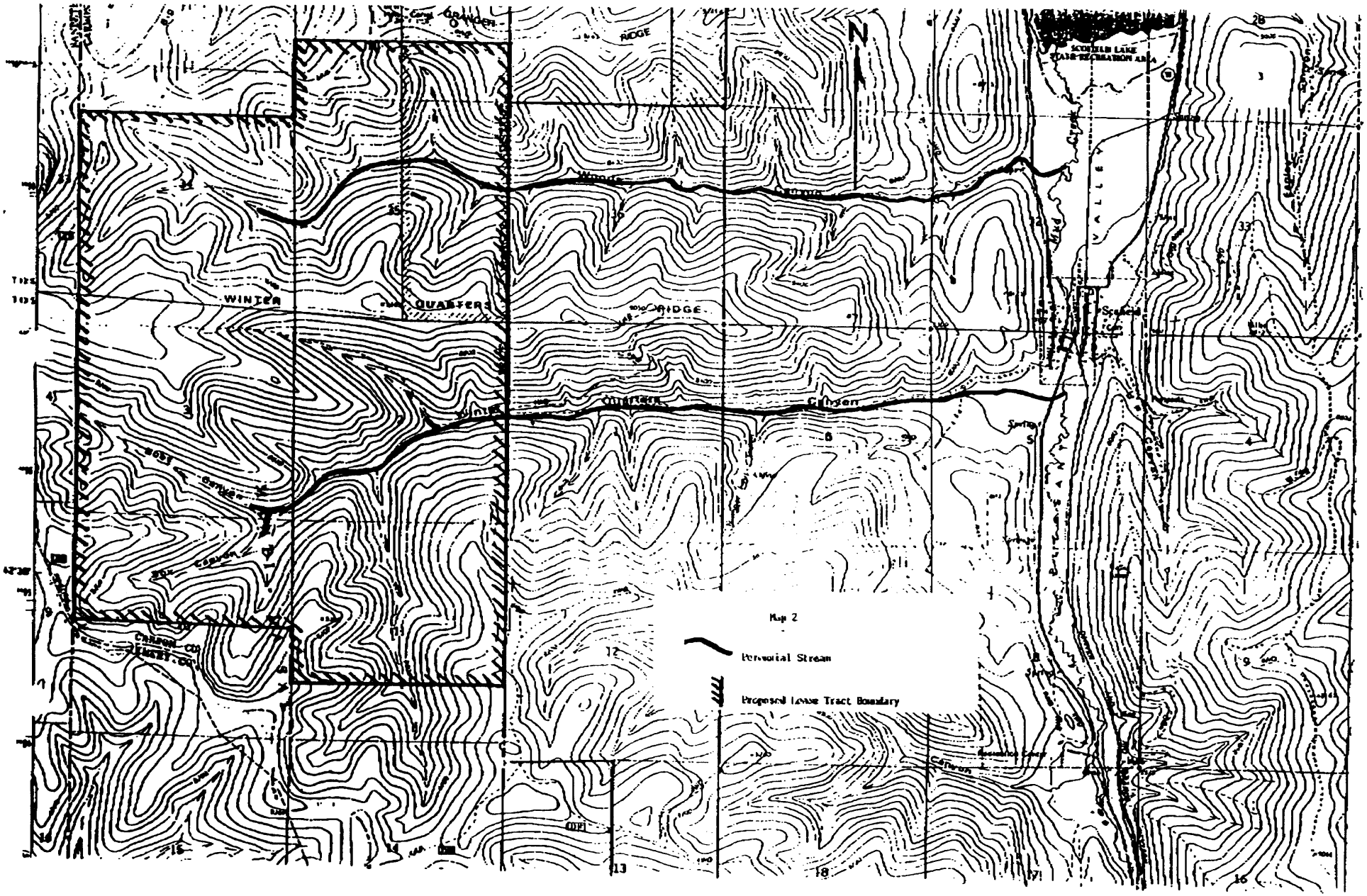
Sincerely,

Stan Perkes

for James F. Kohler
Chief, Solid Minerals Branch

Enclosure: R2P2 (Approval Letter)
Attachment A: Map 2, Environmental Assessment (Perennial Drainages)
R2P2 revisions pages will follow under separate cover

cc: UT-070 (w/Enclosure)
UT-923, SD, Utah (w/Enclosure)
Office of Surface Mining
Western Support Center
1999 Broadway, Suite 3320
Denver, CO 80202-5733 (w/Enclosure)
Dan Meadors, Vice President & General Manager
Canyon Fuel Company, LLC
HC 35 Box 380
Helper, Utah 84526 (w/Enclosure)
Richard Pick, President
Canyon Fuel Company, LLC
6955 South Union Park Center, Suite 550
Midvale, Utah 84047 (w/o Enclosure)



Attachment A

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155
www.ut.blm.gov

IN REPLY PLEASE REFER TO:
3482;
UTU-67939;
(UT-070)

NOV 2 ? 2002

CERTIFIED MAIL--Return Receipt Requested
Certification No.

Mr. Dan Meadors
General Manager
Canyon Fuel Company, LLC
P.O. Box 719
Helper, Utah 84526-0719

Re: Canyon Fuel Company (CFC), Skyline Mine, Resource Recovery and Protection Plan (R2P2)[revised as per this date], Minor Modification Request, Federal Coal Lease UTU-67939, Lower O'Connor "A"/Flat Canyon Seam, November, 2002

Dear Mr. Meadors:

The Bureau of Land Management (BLM) received CFC's revised R2P2 for the Skyline Mine. This letter is to notify you that the Bureau of Land Management (BLM) has completed our review of CFC's R2P2 regarding the Skyline Mine (UTU-67939 (Winter Quarters Tract)). The purpose of our review is to determine compliance with The Mineral Leasing Act of 1920 as amended; the regulations at 43CFR 3480; the lease terms and conditions; and to ensure that Maximum Economic Recovery (MER) will be achieved.

Our determination of the subject R2P2 is as follows:

- The reserves as detailed in the R2P2 are noted as CFC mine plan coal reserves and not the official designated BLM recoverable coal reserves. BLM guidelines state that recoverable coal reserves contained within a Federal lease are based upon those recoverable coal reserves on which diligence is based. These are those recoverable coal reserves determined to exist on the date the lease becomes subject to diligence. The recoverable coal reserve base is not reduced by production after the lease is subject to diligence. The official compilation of the recoverable reserve base within the Federal lease UTU-67939 are those BLM has designated as the recoverable coal reserve base, tied to diligence. The recoverable coal reserve base will be as follows (please see enclosure A):

  Longwall layout areas with 25, 110,000 recoverable tons
  plus Area "A" has a total of 6,160,660 tons and at an estimated 40% recovery the reserve base will be 2,464,000
  plus Area "B" has a total of 2,145,572 tons and at 70% recovery the reserve base will be 1,501,900.
  The total reserve base for diligence purposes will be 29,076,000 tons.

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This approval is Categorically Excluded as a minor modification to an existing mining plan because there is no new surface disturbance in this area as stated in, Overview of BLM's NEPA Process, February 1997, Appendix 2, page 2-7 (F)(7).

Conditions of Approval:

- Those areas of Federal coal lease UTU-67939 designated as Areas "A" and "B" (enclosure 1) as shown will remain as recoverable coal and be mined by CFC. CFC can submit individual proposed R2P2 modifications for those areas deemed by CFC to be uneconomic or otherwise unminable.

- On Page 15 of the R2P2, CFC has stated that "The longwall mining equipment that Skyline Mine owns and operates is designed for high seams and is not readily or safely functional heights below nine feet." Skyline mine must adequately demonstrate this constraint to the satisfaction of the Authorized Officer prior to not longwall mining coal that is between 7 and 9 feet in thickness.

- BLM will require that prior to lease relinquishment, CFC will delineate and mitigate, if necessary, any and all impacts on the surface and other resources. Prior to relinquishment, summary reports addressing impacts to surface topography; vegetation, hydrology, private improvements and a hazardous waste certification must be submitted to allow for evaluation of impacts from mining. No relinquishment shall be approved until the Authorized Officer determines that the relinquishment will not impair the public interest.

BLM has analyzed the situation and reviewed all supporting documentation. The results of the analysis indicate that this change (the proposed addition of Federal lease UTU-67939 to the Skyline Mine) to the Mining Plan (R2P2), with the Conditions of Approval, is in compliance with the Mineral Leasing Act of 1920, as amended, the regulations at 43 CFR 3480, the lease terms and stipulations, and will achieve maximum economic recovery (MER) of the Federal coal. Thus, approval for the modification to the mine plan (R2P2) for the Skyline Mine is granted.

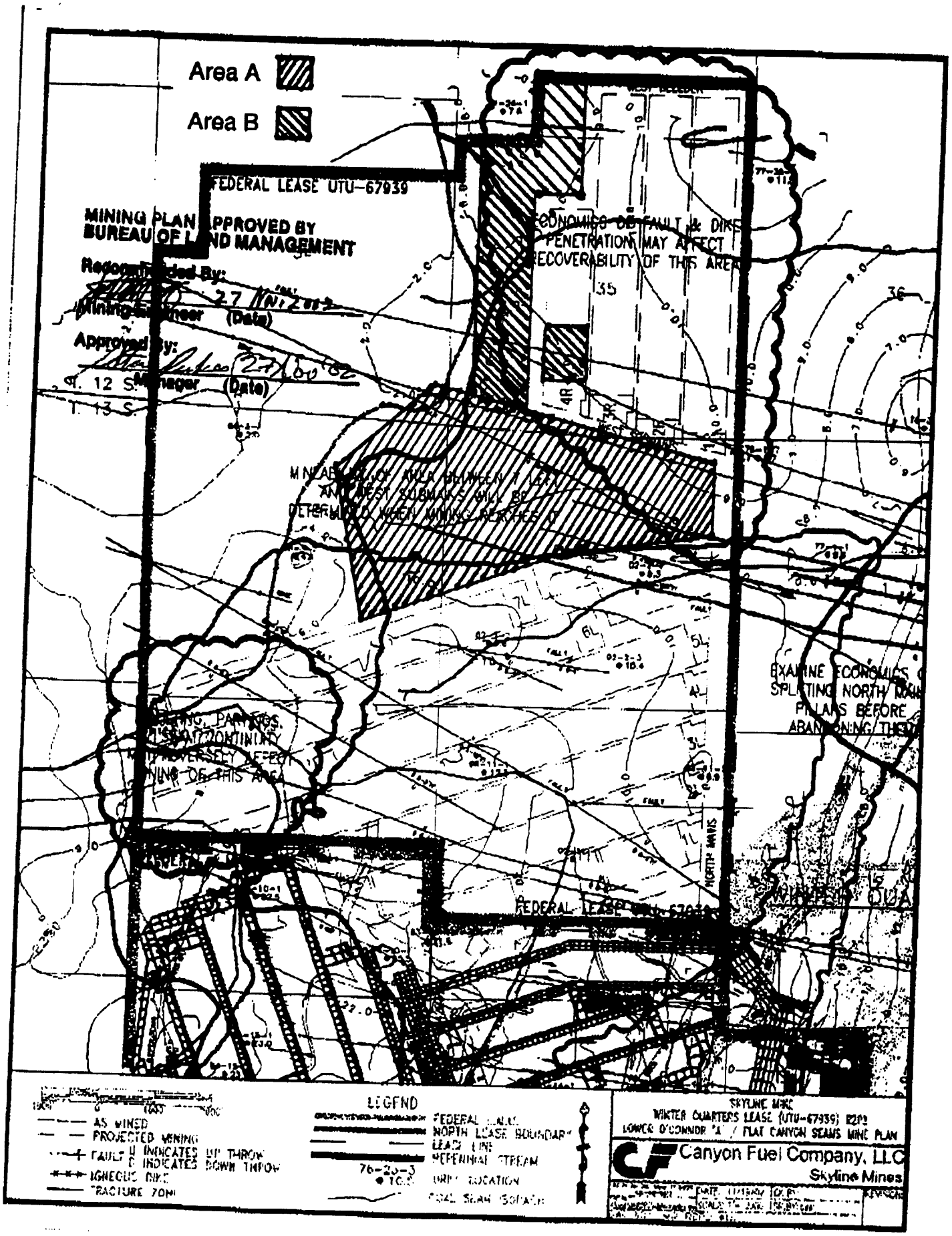
For further information, contact Mr. George Tetreault at (435) 636-3604 or Mr. Stan Perkes (801) 539-4036.

Sincerely,

Stan Perkes
for James F. Kohler
Branch Chief, Solid Minerals

Enclosures
1-Map 1 (1pg)
cc: UTU-67939
bcc: UT-070, George Tetreault

Gtetreault:ks: 11/20/02
MmskyWinterQ.N22


Area A
Area B
FEDERAL LEASE UTU-67939
MINING PLAN APPROVED BY
BUREAU OF LAND MANAGEMENT
Recommended By:
Mining Engineer (Date)
Approved By:
Manager (Date)
T. 12 S.
T. 13 S.
ECONOMICS OF FAULT & DIKE
PENETRATION MAY AFFECT
RECOVERABILITY OF THIS AREA
35
36
EXAMINE ECONOMICS
SPLITTING NORTH
PILLARS BEFORE
ABANDONING THEM
FEDERAL LEASE
NORTH MAINS
LEGEND
AS MINED
PROJECTED MINING
FAULT
INDICATES UP THROW
INDICATES DOWN THROW
IGNEOUS DIKE
FRACTURE ZONE
FEDERAL LEASE
NORTH LEASE BOUNDARY
LEASE LINE
PERENNIAL STREAM
DRILL LOCATION
COAL SEAM ISOPACH
SKYLINE MINE
WINTER QUARTERS LEASE (UTU-67939) R2P2
LOWER O'CONNOR "A" / FLAT CANYON SEAMS MINE PLAN
Canyon Fuel Company, LLC
Skyline Mines

From: Jim Dykman
To: Joe Helfrich
Date: 11/15/02 7:06AM
Subject: Re: Winter Quarters Tract, Canyon Fuel Co., Skyline Mine, C/007/005/SR02I

This email confirms No Historic Properties Affected. j.l. dykmann 11.15.02

Jim Dykmann
Deputy Preservation Officer, Utah
300 Rio Grande
Salt Lake City, Utah 84101
801-533-3555
jdykman@utah.gov

>>> Joe Helfrich 11/14/02 03:01PM >>>
Jim,

By way of correspondence to you dated October 8, 2002 we asked for your concurrence on the referenced project. I realize the 30 day lapse is an automatic ok. However, for our records an "E" mail response would be appreciated.....Thanks so much.....Joe

United States Department of Agriculture
Forest Service
Manti-La Sal National Forest
Supervisor's Office
599 West Price River Drive
Price, UT 84501
Phone # (435) 637-2817
Fax # (435) 637-4940

OK

File Code: 2820-4
Date: November 21, 2002

Daron R. Haddock
Permit Supervisor
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, UT 84116-5801

Incoming
C/007/005
C

Re: Permit Extension for North Lease (Winter Quarters), Canyon Fuel Company, LLC, Skyline Mine, C/007/005-SR021-1, Outgoing File

Dear Daron:

We have completed our review of the two latest submittals by Skyline Mine, dated November 5 and November 13, 2002, for entering the Winter Quarters Lease (North Lease). We consent to development (first) mining within the Winter Quarters Lease that would not result in subsidence of the ground surface, as stated in our October 23, 2002 letter. However, there are several areas that need additional information or clarification before we can consent to extraction (longwall or second) mining within the Winter Quarters Tract.

The following information is needed for further analysis of the proposed mining:

1. A life-of-mine plan for the entire lease which projects mining beyond the 5-year plan enclosed in the submittal. The information should show all areas of potential mining, numbers of seams to be mined, etc. Expand the descriptions of the impacts to cover the entire Winter Quarters tract, including the Woods Canyon area. The 5-year plan enclosed with this submittal does not match the plan provided by Skyline in August, 2002 with their permit modification application to increase the permit area. Drawing 3.1.8-2 shows two panels east of the mains, south of Winter Quarters Canyon. The western of the two panels would be on National Forest System lands. This information is necessary to evaluate the extent and nature of potential mining impacts.

2. A map showing the extent and magnitude of potential subsidence. There must also be a discussion of how subsidence may be affected by the faulting in the area, such as the potential for focused subsidence along the faults.

3. The macroinvertebrate surveys should be done this fall and next spring.

4. Stream gradient surveys of all streams which may be subsided.

5. A map showing all perennial stream reaches.

6. The hydrologic monitoring plan must be expanded to provide more detail regarding objectives and methods.

7. There is a general lack of substantiation of statements made within the plan. Cite references that support statements.

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The following comments are keyed to specific portions of the Mine Plan text:

Page 2-13, 2.2.7 Mineable Coal Deposits

The second sentence does not make sense and must be revised. As is it reads "The Lower O'Connor "A" and Flat Canyon seams merge in the western portion of the North Canyon and the Lower O'Connor "A".

Page 2-24a, 2.3.2 Characteristics of Seeps and Springs, last sentence of first paragraph.

Substantiate this statement. It is true only if all the springs in the area are adequate for wildlife and sheep use. The presence of another spring nearby does not ensure that it has adequate flow to meet needs.

Page 2-31, 2.3.5.2 Ground Water Rights

These springs need to be incorporated into the hydrologic monitoring plan.

Page 2-32a, first partial paragraph.

Well JC-1 is not shown on any of the maps.

Page 2-35a, last paragraph.

In general, the water quality monitoring program must be described in more detail. Provide the rationale for the choice of monitoring springs. Provide monitoring of springs on faults that will provide data on potential impacts as mining passes through the faults. There is no proposed stream monitoring in Woods Canyon. Winter Quarters Creek should be monitored continuously.

Page 2-42, 2.4.4 Monitoring Program, second paragraph.

Explain the changes to the surface and ground water monitoring program recommended by Mayo and Associates.

Page 2-49, 2.5.2 Mining Impact on Water Quantity, first paragraph.

While monitoring of Burnout Canyon continues, the Burnout Canyon study is complete. As this study was done over the southern portion of this same mine, it should be referenced in this section. The predicted impacts should rely heavily on the Burnout Canyon study. Provide documentation on the rapid sealing of subsidence cracks by swelling clays, especially the accelerated sealing in streams. Briefly describe the clay mineralogy. Describe how the cracks seal when they are formed by tensional forces.

Page 2-50, last sentence of first partial paragraph.

Explain how the water pumped into Eccles Creek has a positive effect on aquatic flow systems. Provide documentation of the positive effects. Are there any negative effects? If so, explain them also.

Page 2-51, 2.5.3 Alternative Water Supply, third and fourth paragraphs.

Describe what documentation is required to show that a water loss has occurred, and explain the duration of the replacement.

Explain how a well and pumps would be operated and maintained after the mine is closed.

Page 2-63f, 2.7.6 Vegetation of the North Lease Tract Area

There is no description of a vegetation-monitoring plan. This plan is required and must be evaluated by the Forest botanist.

Page 2-99a, Subsidence.

Rewrite this paragraph to discuss the potential subsidence over the tract. Skyline Mine has collected detailed subsidence data for many years and should be able to provide a reasonably accurate prediction for the Winter Quarters tract. References to subsidence in New Mexico are totally irrelevant when local data are available. Use the Burnout Canyon study for conclusions and reference it. Explain the methodology for subsidence monitoring.

Page 4-91, 4.17.1 Subsidence Probability Survey, and Drawing 4.17.3-1A

Explain what data were used in preparing the subsidence prediction. Explain why surface cracks are predicted along both sides of the stream but do not cross the stream. The 700 foot overburden line does not match the 700 foot line on drawing 2.2.7-2. Explain which drawing is correct.

Drawing 2.3.6-1, Location of Hydrologic Monitoring Stations

Spring WQ4-7 and surface water points C-18 and C-19, which are listed as water monitoring points in the text, are not shown on this map. Also include the surface geology, faults, and any other features which are relevant, based on the objectives of the water monitoring plan.

Drawing 3.3-2, Lower O'Conner "A"/Flat Canyon Five Year Projected Mine Plan

This map does not correlate with Drawing 3.1.8-2 provided by Skyline Mine in August, 2002, with their permit modification application to increase the permit area. The earlier application included 2 panels east of the mains, oriented north south. If these 2 panels are actually planned, they must be evaluated to determine potential impacts to National Forest System lands. Please provide a corrected copy of Drawing 3.3-2 if these 2 panels are planned.

Please contact Dale Harber at (435) 636-3548 if you have any questions.

Sincerely,

for ELAINE J. ZIEROTH
Forest Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UTAH 84119

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DIV OF OIL GAS & MINING

In Reply Refer To
FWS/R6
ES/UT

November 25, 2002

Joe Helfrich
Utah Division of Oil, Gas & Mining
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Incoming
C/007/005

RE: Informal section 7 Endangered Species Consultation, 1996 Biological Opinion Coordinated Review Winter Quarters Tract, Canyon Fuel Co. LLC, Skyline Mine, C/007/005-SR021

Dear Mr. Helfrich:

The U.S. Fish and Wildlife Service (Service) has reviewed your letters of November 15 and November 21, 2002. Potential impacts to proposed or listed species from mining activities have been previously addressed in the Service's September 24, 1996 Biological Opinion and Conference Report on Surface Coal Mining and Reclamation Operations under the Surface Coal Mining and Reclamation Act of 1977. As part of the terms and conditions of this BO, the regulatory authority must implement and require compliance with any species-specific protective measures developed by the Service field office and the regulatory authority.

Surface water depletions of more than 100 acre/ft/yr adversely affect four listed threatened and endangered fish species of the upper Colorado River drainage. Consequently, the U.S. Fish and Wildlife Service require mitigation when water depletions exceed 100 acre-feet annually. None of the approximately 51,870,720 gallons/yr (159 acre/feet/year) of water consumed for mining is from surface sources nor does it deplete surface water sources. The projected mine water discharge rate of 2,800 gpm (4517 acre/ft/yr) to Eccles Creek is water the mining operators have estimated to be 4,000 to 25,000 years old. Thus there is no depletion to the upper Colorado River drainage from this project.

Based on the estimation that this project does not result in a depletion to the upper Colorado River drainage, we concur with your "no effect" determination for the bonytail, humpback chub, Colorado pikeminnow, razorback sucker and critical habitat. We also concur with your "no effect" determination for the remaining four threatened and endangered species and critical habitat included in the species list for Carbon County: Mexican spotted owl, bald eagle, black-footed ferret and Graham beardtongue. Therefore, no endangered species-specific protective measures for these four are considered necessary for the subject project. Should project plans

change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

Only a Federal agency can enter into formal Endangered Species Act section 7 consultation with the Service. A Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment by giving written notice to the Service of such a designation. The ultimate responsibility for compliance with ESA section 7, however, remains with the Federal agency.

We commend your agency's continued efforts to conserve endangered and sensitive species, including raptors. In this instance, we appreciate that the permittee has committed in the lease tract application to conduct a raptor survey in the early summer of 2003. As you are aware, we have developed and recommend the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* to assist agencies and individuals with raptor-sensitive project planning. Seasonal and spatial buffers of inactivity are recommended for raptor nest sites.

We appreciate your interest in conserving endangered species. If further assistance is needed or you have any questions, please contact Diana Whittington, at (801) 975-3330 extension 128.

Sincerely,

Henry R. Maddux
Utah Field Supervisor

cc: Office of Surface Mining, (Attention: Ron Sassaman), Denver Field Division, 1999 Broadway, Suite 3320, Denver, Colorado 80202-5733

UDWR - Salt Lake City (Attn: Frank Howe)