# 3R2S Panel Block "B"

C041/002
Sufco Mine
Canyon Fuel Company, LLC

June 2013

Incoming C0410002
#4367
K

**Canyon Fuel Company, LLC**
A Subsidiary of Arch Western Bituminous Group, LLC

**Sufco Mine**
Kenneth E. May
General Manager
597 South SR24
Salina, Utah 84654
(435) 286-4400
Fax (435) 286-4499

June 3, 2013

Permit Supervisor
Utah Coal Regulatory Program
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, UT 84114-5801

Re: 3R2S Panel Block "B", South Fork of Quitchupah, Sufco Mine, Permit Number C/041/0002

Dear Sirs:

Please find enclosed with this letter an amendment to the Sufco Mine Permit to add Block "B" of the 3R2S Panel for mining. We have included four redline/strikeout copies of the text and 4 copies of the maps associated with this amendment. There are two confidential drawings in this submittal.

A portion of Block "A" of the 2R2S Panel and a portion of Block "B" of the 3R2S Panel are located under the South Fork of Quitchupah Creek channel which required the writing of the monitoring and mitigation plan (Appendix 3-14). The monitoring and mitigation plan that is currently approved for the 2R2S Panel will be followed for the 3R2S Panel. The commitments will be identical except when changes in the mining schedule for the individual panels require changes in the timing for monitoring and subsequent submittal of information. For this submittal the monitoring and mitigation plan has been reorganized to enable us to find the commitments more easily. Subheadings have been used and the various commitments organized under the specific subheading.

Studies were performed on the South Fork of Quitchupah Creek where the mining of both the 2R2S (A) and 3R2S (B) cross beneath the creek channel.

Appendix 3-4 – Raptor Surveys (Confidential)
Appendix 3-14 – Monitoring and Mitigation Plan
Appendix 4-2 – Cultural Resource Study (Confidential)
Appendix 7-26 – PHC
2012 Annual Report – Loss Gain Study, Riparian Vegetation Study

If you have questions or need addition information please contact Vicky Miller at (435)286-4481.

CANYON FUEL COMPANY
SUFCO Mine

Kenneth E. May
General Manager

Encl.

cc: DOGM Correspondence File

File in:
☐ Confidential
☒ Shelf Incoming 0002
☐ Expandable
Date Folder 060513 C/0410002
See Confidential

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DIV. OF OIL, GAS & MINING

# APPLICATION FOR COAL PERMIT PROCESSING

Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

**Permittee:** Canyon Fuel Company, LLC
**Mine:** Sufco Mine **Permit Number:** C/041/0002
**Title:** 3R2S Panel Block "B"
**Description,** Include reason for application and timing required to implement:

**Instructions:** If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

☐ Yes ☒ No 1. Change in the size of the Permit Area? Acres: _____ Disturbed Area: _____ ☐ increase ☐ decrease.
☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO# _____
☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes ☒ No 6. Does the application require or include public notice publication?
☐ Yes ☒ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes ☒ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes ☒ No 9. Is the application submitted as a result of a Violation? NOV # _____
☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
*Explain*: _____
☐ Yes ☒ No 11. Does the application affect the surface landowner or change the post mining land use?
☒ Yes ☐ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
☐ Yes ☒ No 13. Does the application require or include collection and reporting of any baseline information?
☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
☒ Yes ☐ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes ☒ No 17. Does the application require or include construction, modification, or removal of surface facilities?
☒ Yes ☐ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
☒ Yes ☐ No 19. Does the application require or include certified designs, maps or calculation?
☐ Yes ☒ No 20. Does the application require or include subsidence control or monitoring?
☐ Yes ☒ No 21. Have reclamation costs for bonding been provided?
☒ Yes ☐ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
☒ Yes ☐ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

**Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you.** (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

John D. Byars
Print Name

, Mgr. Engineering, 6-4-13
Sign Name, Position, Date

Subscribed and sworn to before me this 4 day of June, 20 13

Notary Public
My commission Expires: _____, 20____}
Attest: State of _____} } ss:
County of _____

JACQUELYN NEBEKER
Notary Public
State Of Utah
My Commission Expires 3/24/2015
Commission# 606049

| For Office Use Only: | Assigned Tracking Number: | Received by Oil, Gas & Mining |
|---|---|---|
| | | RECEIVED JUN 05 2013 DIV. OF OIL, GAS & MINING |

# APPLICATION FOR COAL PERMIT PROCESSING
## Detailed Schedule Of Changes to the Mining And Reclamation Plan

**Permittee:** Canyon Fuel Company, LLC
**Mine:** Sufco Mine **Permit Number:** C/041/002
**Title:** 3R2S Panel Block "B"

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

| | | | DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED |
|---|---|---|---|
| ☐ Add | ☐ Replace | ☐ Remove | M&RP |
| ☐ Add | ☒ Replace | ☐ Remove | Chapter 3, Table 3-3 and Table 3-3, Page 3-45C |
| ☐ Add | ☒ Replace | ☐ Remove | Appendix 3-14 , Monitoring and Mitigation Plan for Undermining the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B" |
| ☐ Add | ☒ Replace | ☐ Remove | Chapter 4, Page 4-12 |
| ☐ Add | ☒ Replace | ☐ Remove | Chapter 5, Pages 5-39C thru 5-39F |
| ☐ Add | ☒ Replace | ☐ Remove | Plates 5-10A and 5-10C |
| ☐ Add | ☒ Replace | ☐ Remove | Chapter 7, Pages 7-51G, 7-51H and 7-51J |
| ☐ Add | ☒ Replace | ☐ Remove | Plates 7-2A and 7-3 |
| ☐ Add | ☐ Replace | ☐ Remove | |
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| ☐ Add | ☐ Replace | ☐ Remove | |
| ☐ Add | ☐ Replace | ☐ Remove | CONFIDENTIAL |
| ☐ Add | ☒ Replace | ☐ Remove | Plates 5-10AC and 5-10CC |
| ☐ Add | ☐ Replace | ☐ Remove | |
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| ☐ Add | ☐ Replace | ☐ Remove | |
| ☐ Add | ☐ Replace | ☐ Remove | |
| ☐ Add | ☐ Replace | ☐ Remove | |

| **Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.** | **Received by Oil, Gas & Mining** |
|---|---|
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# CHAPTER 3

# BIOLOGY

**Table 3-1**

**Federally Listed and Proposed Endangered Species in Utah**

**Sevier and Emery Counties**

**April 2, 2013**

| **Plants** | | **Status** |
|---|---|---|
| Barneby Reed-Mustard | Schoenocrambe barnebyi | E |
| Heliotrope Milk-Vetch | Astragalus montii | T |
| Jones Cycladenia | Cycladenis humilis var. jonesii | T |
| Last Chance Townsendia | Townsendia aprica | T |
| San Rafael Cactus | Pediocactus despainii | E |
| Wright Fishhook Cactus | Sclerocactus wrightiae | E |
| Winkler Cactus | Pediocactus winkleri | T |
| **Mammals** | | |
| Utah Prairie Dog | Cynomys parvidens | T |
| **Birds** | | |
| Mexican Spotted Owl | Strix occidentalis lucida | T |
| Southwestern Willow Flycatcher | Empidonax traillii extimus | E |
| Greater Sage-grouse | Centrocercus urophasianus | C |
| Western Yellow-billed Cuckoo | Coccyzus americanus | C |
| California Condor | Gymnogyps californianus | E |
| **Fish** | | |
| Bonytail Chub | Gila elegans | E |
| Colorado Pikeminnow | Ptychocheilus lucius | E |
| Humpback Chub | Gila cypha | E |

| | | |
|---|---|---|
| Razorback Sucker | Xyrauchen texanus | E |

**Reptiles**

**None listed in the Sevier and Emery Counties**

**Snails**

**None listed in the Sevier and Emery Counties**

E - Endangered T - Threatened Extirpated - No longer occur in Utah C - Candidate

For additional information contact: U. S. Fish and Wildlife Service, 2078 Administration Building, 1745 West 1700 South, Salt Lake City, Utah 84204-5110
Telephone: Commercial (801) 975-330

**Table 3-3**

**USDA-FS Region 4 Sensitive Species**

**Fishlake and Manti-LaSal**

**February 2013 Update**

| **Plants** | | **Status** |
|---|---|---|
| Link Trail Columbine | Aquilegia flavescens var. rubicunda | K |
| Cruetzfeldt-flower Cryptanth | Cryptantha creutzfeldii | K |
| Carrington Daisy | Erigeron carringtoniae | K |
| Canyon Sweetvetch | Hedysarum occidentale var. canone | K |
| Maguire Campion | Silene petersonii | K/P |
| Musinea Groundsel | Senecio musinensis | K |
| Arizona Willow | Salix arizonica | K |
| Wonderland Alice Flower | Aliciella caespitosa | K |
| Chatterley Onion | Allium geyeri var. chatterleyi | K |
| Sweet-flower Rock Jasmine | Androsace chamaejasme ssp. Carinata | K |
| Bicknell milkvetch | Astragalus consobrinus | K/P |
| Isely's Milkvetch | Astragalus iselyi | K |
| Tushar Paintbrush | Castilleja parvula var. parvula | K |
| Pinnate Spring-parsley | Cymopterus beckii | K |
| Abajo Peak Draba | Draba abajoensis | K |
| Mt. Belknap Draba | Draba ramulosa | K |
| Creeping Draba | Draba sobolifera | K |
| Nevada Willowherb | Epilobium nevadense | K |
| Abajo Daisy | Erigeron abajoensis | K |
| Kachina Daisy | Erigeron kachinensis | K |
| Maquire Daisy | Erigeron maguirei | K |
| LaSal Daisy | Erigeron mancus | K |
| Elsinore Buckwheat | Eriogonum batemanii var. ostlundii | K |

| | | |
|---|---|---|
| Canyonlands Lomatium | Lomatium latilobum | K |
| Fish Lake Naiad | Nafas caespitosa | K |
| Beaver Mountain Groundsel | Packera castoreus | K |
| Little Penstemon | Penstemon parvus | K |
| Ward Beardtongue | Penstemon wardii | K |
| Bicknell Thelesperma | Thelesperma subnudum var. alpinum | K |
| Barneby Woody Aster | Tonestus kingii var. barnebyana | K |
| Sevier Townsendia | Townsendia jonesii var. lutea | K |

**Mammals**

| | | |
|---|---|---|
| Townsend's Western Big-eared Bat | Corynothinus townsedii townsendii | K |
| Spotted Bat | Euderma maculatum | K |
| Bighorn Sheep | Ovis canadensis | K |
| Pygmy Rabbit | Brachylagus idahoensis | K |

**Birds**

| | | |
|---|---|---|
| Northern Goshawk | Accipiter gentilis | K |
| Flammulated Owl | Otus flammeolus | K |
| Northern Three-toed Woodpecker | Picoides tridactylus | K |
| Bald Eagle | Haliaeetus leucocephalus | K |
| Greater Sage-grouse | Centrocercus urophasianus | K |
| Peregrine Falcon | Falco peregrinus anatum | K |
| Yellow-billed Cuckoo | Coccyzus americanus | K/P |
| Southwestern Willow Flycatcher | Empidonax traillii extimus | K |

**Fish**

| | | |
|---|---|---|
| Colorado River Cutthroat Trout | Oncorhynchus clarki pleuriticus | K |
| Bonneville Cutthroat Trout | Oncorhynchus clarki utah | K |
| Southern Leatherside Chub | Lepidomeda aliciae | K |

**Amphibians**

| | | |
|---|---|---|
| Columbia Spotted Frog | Rana luteiventris | K |
| Boreal Toad | Bufo boreas | K |

Sensitive: Any species which, although still occurring in numbers adequate for survival, has been greatly depleted or occurring in limited areas and/or numbers due to a restricted or specialized habitat.

K - Known distribution species and or habitat

P - Suspected species or potential habitat

USDA-Manti-LaSal National Forest, 599 Price River Dr., Price , Utah 84501

supporting riparian vegetation is derived from the fine-grained rocks of the Price River and North Horn formations. This alluvium is expected to naturally readily fill fractures that may occur in the channel substrate thus limiting the loss of flow, if any, supporting the riparian vegetation.

Though not anticipated, short segments of Cowboy Creek could be subsided in the SITLA Muddy Tract. If this is anticipated to occur, Sufco, with the approval of the Division and concurrence of the Forest, will instigate a vegetation monitoring and mitigation plan similar to the plan implemented prior to the undermining of the East Fork of Box Canyon. If mitigation of surface cracks is required, methods similar to those proposed and implemented in the East Fork of Box Canyon as described in Chapter 5 Section 5.2.5.1 and Chapter 7 Section 7.3.1.8 will be used.

The monitoring and mitigation plan for undermining the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B" is located in Appendix 3-14.

The applicant will request that future power lines on the SUFCO Mine site be constructed per OSM and UDOGM regulations or with alternative guidelines approved by the regulatory authority. Additional information referencing power lines is located in Section 3.5.8.5.

Efforts will be taken to regulate the use of pesticides when needed. Before a pesticide is used, the type and concentration will be approved by the Regulatory Authority.

# APPENDIX 3-14

## Monitoring and Mitigation Plan for Undermining the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B"

**Monitoring and Mitigation Plan for Undermining the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B"**

Implementation of the ~~following~~ mitigation plan will ~~quickly~~ assist in identifying surface disturbance or impacts from subsidence fractures intercepting spring and stream flows. Frequent monitoring will establish the degree of impacts to water resources, vegetation, wildlife and other uses.

The monitoring and mitigation plan ~~adopted by the mine~~ will provide sufficient data for ~~all~~ stakeholders associated with these resources and lands to make a determination of the degree of impacts. Information and data will be collected before the area is mined, throughout the mining period, and after mining is past. Monitoring and data collection will continue until the mine, Division and Forest agree that mining impacts, if any, have occurred, have been mitigated, and no further impacts are anticipated.

~~Hydrological and Subsidence Mitigation Plan for Undermining the South Fork of Quitchupah for 2R2S Block "A"~~

Subsidence R645-301-525.454

Pre- and post-mining subsidence surveys will be conducted of the length of stream channel where it will be undermined by Block "A" of the 2R2S panel and by Block "B" of the 3R2S panel. The procedures will be similar for the pre- and post-mining subsidence surveys. ~~Conduct pre-and post-mining survys of the undermining the South Fork of Quichupah 2R2S Block "A" stream channel over panel 2R2S. The mine will conduct a post-mining survey during 2015. This post-mining survey must apply the same procedures as the survey conducted in 2012.~~

Hydrology

1. Conduct a stream channel profile survey from 006A above the 2R2S Panel Block "A"to 006D located below the 3R2S "B" panel.

2. Establish at least 4 stations to portray stream flow, vegetation, soils, etc. GPS coordinates shall be obtained for each site. Each site must be documented with fixed photo points that can be reproduced during subsequent monitoring intervals. Four sites include 006, 006A, 006B and 006C.

3. Establish location of perennial flow, gaining/losing reaches of the stream channel from site 006A to 006D.

4. Water monitoring shall be conducted prior to mining under the stream channel.

5. Stream channel geomorphology – will be define at a minimum as geologic/surface substrate of stream bottom and width of stream channel at water-monitoring locations.

6. Spring and surrounding area geomorphology – will be define at a minimum as geologic/surface substrate of spring area where the water discharges; geologic/surface substrate of the spring tributary where water converges from the discharge site(s) and forms a tributary of the South Fork Quitchupah stream.

~~* Stream channel and spring vegetation communities – at a minimum:~~
~~o Survey all stream and spring monitoring locations.~~

Monitoring

1. While mining under the channel, promptly identify subsidence-induced fractures, dewatering, diminution of water quality, and movement of the stream channel.

2. Semi-weekly visual inspections for fractures, stream channel and flow observations while mining within the angle-of-draw of the stream channel.

   Monitor surface water flow ~~and channel bi-weekly~~ twice a month while mining within the angle-of-draw of the stream channel.

   Continue monitoring quarterly for 2-year period after no subsidence, interception, diminution or diversions are identified. However, additional surface and/or groundwater samples will be collected for total iron if a visible iron precipitate is noted within the stream channel or originating from the springs and seep.

3. Stockponds 94-115 and 94-116 will be monitored prior to mining and while mining within the angle-of-draw of the stream channel.

4. Conduct uninterrupted longwall mining progression, except for normally scheduled maintenance, while under the 15-degree angle-of-draw of the stream channel.

5. Provide a bi-weekly (once every two weeks) report to DOGM and the Fishlake National Forest via e-mail. Identify any changes in surface expression, dates, any fracturing of surface (location, width, spacing, etc.), any repairs, and location of longwall.

Weather Access

If the applicant cannot gain access to the site, due to weather conditions, etc., attempts must be documented.

Mitigation

1. Mitigate subsidence cracks and fractures identified within the stream channel wet bank. Access must be limited to methods that would not cause additional effects to the aquatic ecosystem.

2. Mitigation of cracks that interrupt or divert flows from the stream channel will be sealed immediately with an appropriate impermeable grout or, in some cases, native materials. Sufco will attempt to seal cracks with the least intrusive methods (typically hand placement of grout or native materials) first. The sealing material may be placed by pouring it directly into the crack or, if cracks occur in an actively flowing portion of the stream, the stream may be temporarily diverted using native materials (or a designed flume if necessary to maintain the flow) until the crack is sealed. If cracks are present in channel walls defined by soil, the soil cracks may be hand filled using a native soil/bentonite mix. The sealing of the channel floor and walls will be accomplished with hand tools such as shovel, picks, trowels, etc.

3. As a backup plan, in the unlikely event that cracks too large to be sealed through the efforts of one or two persons in one day do occur and it appears there is a danger of water being diverted from the channel for an extended period of time, the stream will be temporarily diverted using native materials and a pipe to carry the flow over the crack to maintain the channel flow. Arrangements will be made to get a contractor to the site as soon as possible to repair the crack after consultation with the Forest Service.

4. There may be sections of the stream channel that may require more intensive mitigation efforts to restore surface flows in the creek. These efforts could include the drilling of closely spaced shallow boreholes in and adjacent to the stream channel and the injection of an acceptable impermeable grout into the alluvium or bedrock. The work will be accomplished either using hand tools or low impact equipment to minimize surface disturbance. Existing roads and turnouts will be used as staging areas to locate larger equipment and supplies. Any hoses or lines will be transported from the staging areas to the nearby worksites either by hand, the use of pack animals, or by helicopter. This work will be done with a contractor selected after consultation with the Forest Service.

6. A stream alteration permit is required by Utah Division of Water Rights for any stream channel construction activities. The mine will obtain a stream alteration permit prior to construction activities within the stream channel.

5. The applicant will be required to abide by the mitigation outlined in the approved MRP and comply with Resource Recovery and Protection Plan (June 8, 2011), federal and State rules and regulations.

~~Refer to Conditions of Approval of the Resource Recovery and Protection Plan (R2P2), (June 8, 2011).~~

<u>Water Rights Replacement of State Appropriated Water Supplies</u> (MRP, Chapter 7, ~~R645-301-~~731.530~~, MRP page 7-54~~)

1. After calculating the amount of diminished flow from monitoring data, the mine will promptly provide alternate sources of water, replace or compensate any State

appropriated water supply that is contaminated, diminished or interrupted by mining operations for wildlife, cattle, and drinking water.

~~Calculate the amount of diminished flows from monitoring data.~~

## Erosion

1. Describe effects of erosion along stream channel, on hillsides flanking the steam channel, and at spring locations. Numerically rate erosion effects. For example, 1=extreme erosion, 2=high erosion, 3=moderate erosion, 4=slight erosion, 5=no erosion.

## Vegetation

1. Qualified botanist must participate in the survey of the channel to identify major representative plant species along the stream channel and riparian and spring areas. Width of the spring tributary at the location where the consultant surveys vegetation.

2. Define vegetation communities at ~~all~~ monitoring locations (SUFCO-006A - 006D). Create inventory map of vegetation communities at ~~all~~ monitoring locations. Inventory stream channel and spring area for threatened, endangered, candidate, and sensitive species. ~~Survey all TEC and Sensitive species.~~ Provide population location and individual numbers for each population.

3. Provide photographs of communities along stream channel, on hillsides flanking the steam channel, and at spring locations. Take photographs at established photo points.

4. Repeat vegetation community condition observations two times a year (beginning and end of growing seasons) per the table below. ~~for the first two years and the fifth year following undermining. Refer to schedule below.~~

~~Baseline data prior to undermining: 2012 report in the 2013 Annual Report.~~
~~1st year data following undermining: 2014 report in the 2015 Annual Report.~~
~~2nd year data following undermining: 2015 report in the 2016 Annual Report.~~
~~5th year data following undermining: 2018 report in the 2019 Annual Report.~~

| Panel/Block No. | Baseline | DOGM Annual Report | Year 1 (Est.) | DOGM Annual Report (Est.) | Year 2 (Est.) | DOGM Annual Report (Est.) | Year 5 (Est.) | DOGM Annual Report (Est.) |
|---|---|---|---|---|---|---|---|---|
| 2R2S "A" | 2012 | 2013 - C | 2014 | 2015 | 2015 | 2016 | 2018 | 2019 |
| 3R2S "B" | 2012 | 2013 - C | 2015 | 2016 | 2016 | 2017 | 2019 | 2020 |
| | | | | | | | | |

Est. - Estimated year for survey and/or submittal in annual report.

C - Completed

Provide two copies of the survey reports to DOGM, include one copy in DOGM Annual Reports. The Division will provide the second copies to the Fishlake National Forest.

5. The mine operator will implement, if necessary, a revegetation/mitigation plan as determined by DOGM in consultation with the USFS.

Biology Monitoring Plan

1. A qualified botanist will survey ~~and mention all~~ animal species present along the stream channel, ~~and~~ riparian and spring areas ~~All other animal species~~ . ~~A qualified botanist will survey the stream channel and associated spring areas starting~~ from monitoring location Sufco- 06A above the 2R2S Panel (Block "A") to 006D located below the 3R2S panel (Block "B").

2. Survey macroinvertibrates presence at a minimum three monitoring stations along the stream channel and riparian and spring areas (organism species and number (#/m2). Contractor must use an approved survey protocol.

3. Reports will be prepared for the collection of baseline data prior to undermining and submitted in the following year's Annual Report and in the fifth year following undermining. The fifth year survey data will be submitted in the DOGM annual report the year following the survey.

~~Reports will be prepared for baseline data prior to undermining in 2012 and submitted in the 2013 Annual Report. Fifth (5th) year data following undermining will be reported in 2018 report in the 2019 Annual Report. Provide two copies of the survey reports and maps to DOGM. Include one copy in the DOGM Annual Reports. The Division will provide the second copy to the Fishlake National Forest.~~

~~o Three monitoring sites.o Organism species and number (#/m2).~~
~~The mine will follow the basics of the Division's Guidelines for Undermining the South Fork of Quitchupah 2R2S Block "A" qualified biologist will survey the baseline populations of the macroinvertibrate within the portion of the stream channel to be subsided.~~
~~Stream channel and spring geomorphology and vegetation. The following information will be collected prior to mining:~~

~~* Stream channel and spring area vegetation community condition – at a minimum:~~
~~o Describe condition along steam bank. Concentrate observations at all monitoring locations.~~
~~o Describe condition at all spring locations. Concentrate observations at all monitoring locations as well as discharge sites if different from monitoring locations.~~

Cultural Resource Monitoring Plan ~~for undermining the South Fork of Quitchupah 2R2S Block "A" panel (2012)~~

Cultural and Historic information summary is located in Chapter 4 of the M&RP~~, pages 4-12 to 4-12A~~. Cultural resource information and maps identifying cultural and historical study areas are located in Appendix 4-2 in the Confidential folder of the M&RP. No extraordinary monitoring, outside of that which is already required by the regulatory authorities and SHPO throughout the permit area, is required for the area of the ~~2R2S Block "A"~~ panels ~~area~~.

Hydrologic and Subsidence Summary Report

The mine will submit a summary report to the Division documenting the pre- and post-mining conditions of springs and stream channels. The report will describe all activities and work conducted by the mine for site evaluation and mitigation. Further, the report will identify if impacts have occurred, and if mitigation activities have prevented material damage to resources. The report will be due 90 days after subsidence monitoring is complete for the 2R2S Block "A" and 3R2S "B" panel sections. The Division will provide a copy of the report to the Fishlake National Forest.

~~The mine will provide two copies of an Executive Summary of monitoring results to the Division. One copy will be included in the mine's Annual Report. The Division will provide the second copy to the Fishlake National Forest.~~

# CHAPTER 4

# LAND USE AND AIR QUALITY

The Applicant agrees, however, to notify the regulatory authority and the Utah State Historical Preservation Office (SHPO) of previously unidentified cultural resources discovered in the course of mining operations. The Applicant also agrees to have any such cultural resources evaluated in terms of National Register of Historic Places eligibility criteria.

**West Coal Lease Modification Areas**

**Cultural and Historic Information.** Cultural resource information and maps identifying cultural and historical study areas are located in Appendix 4-2 in the Confidential folder of the M&RP. EarthTouch, Inc. conducted an intensive evaluation of the West Coal Lease Modification Areas.

The results of the cultural resource inventory for the project resulted in the identification of 15 cultural resource sites, which included three previously recorded sites (42SV1301, 42SV1386 and 42SV2688), and 12 new sites (42SV3207-3215 and 42SV3246-3248). Overall, the identified cultural resource sites consist of small- to moderate-sized lithic scatters and small rock shelters/overhangs, some with associated pictographs. Of the 15 sites identified within the West Coal Lease Modification Areas, six sites are recommended eligible for the National Register of Historic Places. These sites include 42SV3209, 42SV3211, 42SV3212, 42SV3213, 42SV3247 and 42SV3248 which consist of small rock shelters and rock shelters with pictographs. Site 42SV3209 will be the only site undermined under the present mine plan. This shelter is more of a terrace overhang that extends 6 meters long, with a 1.5 meter overhang or width.

**South Fork of Quitchupah Area of 2R2S Block "A" and 3R2S Block "B"**

**Cultural and Historic Information.** Cultural resource information and maps identifying cultural and historical study areas are located in Appendix 4-2 in the Confidential folder of the M&RP. Canyon Environmental conducted an evaluation of the South Fork of Quitchupah in and adjacent to the 2R2S Block "A" panel Area.

The results of the cultural resource inventory for the project resulted in the identification of 4 cultural resource sites, which included one previously recorded site (42SV2690), and 3 new sites (42SV3462, 42SV3463 and 42S3464). Overall, the identified cultural resource sites consist of lithic

# CHAPTER 5

# ENGINEERING

stream channel or reduction in stream flows were noted as a result of undermining that portion of Burnout Canyon using the approved mining schedule.

A weekly report will be submitted via e-mail to the Division detailing the results of the inspections. The reports will include, but not necessarily be limited to: a map illustrating the current location of the longwall face; descriptions and dates of field activities; noted changes in stream and local geomorpholgy; location, width, frequency of cracks; and a description of repairs, if any, conducted. If the prescribed inspections cannot be conducted, the reason for the missed inspection and a record of the attempt to conduct the inspection will be submitted to the Division in the weekly report. The Division will be notified immediately after mining-induced cracks, if any, are found in the East Fork stream channel and the steps taken or planned to be taken as mitigation. Thereafter, the Division will be advised of continuing mitigation efforts, if needed, in the weekly report.

A copy of the October 2003 "Monitoring and Mitigation Plan for Mining Under the East Fork of Box Canyon" prepared by the Division and reviewed and accepted by the Forest with some modifications has been included in Appendix 3-10. The preceding paragraphs have been prepared based on this plan. Sufco will meet all of the monitoring and mitigation responsibilities described in the plan as it pertains to the undermining of the East Fork of Box Canyon.

South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B" Subsidence Monitoring and Mitigation

Portions of the South Fork of Quitchupah will be undermined and subsided as longwall panels 2R2S and 3R2S ~~is~~are extracted. A monitoring and mitigation plan (Appendix 3-14) that is more intensive than the general Mining and Reclamation Plan area has been proposed for monitoring surface and ground water flows, subsidence cracks and repair of the cracks in the portions of the South Fork of Quitchupah channel to be undermined. The subsidence portion of the monitoring and mitigation plan is discussed in detail in the following text.

Prior to the initiation of undermining and subsidence, a pre-subsidence survey of the stream channel will be conducted in the portion of South Fork of Quitchupah that flows over the 2R2S and 3R2S

panels and associated gate roads. The survey will consist of a gain/loss survey of flow within the stream channel paying particular attention to surface flows and ground water discharge, soil conditions, and the general channel geomorphology of the area. A similar study was performed in the past but all stream measurements were not conducted on the same date. The second gain/loss survey will be completed on a single day at or near base flow conditions late in the summer or early fall of 2011. The mine will attempt, as part of this second survey, to occupy the same monitoring sites in the panel area as those chosen in the initial survey. The monitoring of surface and ground water flows are discussed in greater detail in Section 7.3.1.2.

The subsidence monitoring plan for the South Fork of Quitchupah will include frequent inspection of the stream channel during and after active subsidence. While mining is occurring under the stream channel, and within the 15-degree angle-of-draw above the active longwall face, that area of the channel will be inspected semi-weekly for subsidence cracks or other related features. As the longwall face advances and the 15-degree angle-of-draw area follows, the portions of the channel that now lie outside the 15-degree angle-of-draw will be monitored for subsidence features on a quarterly basis for two years following the cessation of subsidence related effects, if any, due to mining.

Mitigation of cracks that interrupt or divert flows from the stream channel will be sealed immediately with an appropriate impermeable grout or, in some cases, native materials. Sufco will attempt to seal cracks with the least intrusive methods (typically hand placement of grout or native materials) first. The sealing material may be placed by pouring it directly into the crack or, if cracks occur in an actively flowing portion of the stream, the stream may be temporarily diverted using native materials (or a designed flume if necessary to maintain the flow) until the crack is sealed. If cracks are present in channel walls defined by soil, the soil cracks will be hand filled using a native soil/bentonite mix. The sealing of the channel floor and walls will be accomplished with hand tools such as shovel, picks, trowels, etc.

As a backup plan, in the unlikely event that cracks too large to be sealed through the efforts of one or two persons in one day do occur and it appears there is a danger of water being diverted from the

channel for an extended period of time, the stream will be temporarily diverted using native materials and a pipe to carry the flow over the crack to maintain the channel flow . Arrangements will be made to get a contractor to the site as soon as possible to repair the crack after consultation with the Forest Service.

There may be sections of the stream channel that may require more intensive mitigation efforts to restore surface flows in the creek. These efforts could include the drilling of closely spaced shallow boreholes in and adjacent to the stream channel and the injection of an acceptable impermeable grout into the alluvium or bedrock. The work will be accomplished either using hand tools or low impact equipment to minimize surface disturbance. Existing roads and turnouts will be used as staging areas to locate larger equipment and supplies. Any hoses or lines will be transported from the staging areas to the nearby work sites either by hand, the use of pack animals, or by helicopter. This work will be done with a contractor selected after consultation with the Forest Service.

Additionally, it may be required to remove loose rock from the channel floor, either where the channel flows across thin-bedded bedrock or where large rock have fallen into the channel and is impeding flows. In the instance of the former, past experience has shown this can occur in the upper Blackhawk Formation and is easily repaired by removing enough of the broken channel surface to again expose the stream flow. In the instance of the later, removal of large rocks could be accomplished by drilling and then fracturing the rock into smaller fragments more easily moved to locations were they are not impeding flow. This work may be completed using available pneumatic or hydraulic tools that do not require road or pad building disturbances. In the unlikely event that large boulders do need to be moved, pumps and tanks necessary to complete the work will be located in pre-disturbed areas, such as roads or turnouts, and hoses will be walked into the work area.

A copy of the ~~2012~~ "Monitoring and Mitigation Plan for Undermining the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B" has been included in Appendix 3-14. The preceding paragraphs have been prepared based on this plan. Sufco will meet all of the monitoring and mitigation

responsibilities described in the plan as it pertains to the undermining of the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B"

Sufco will conduct longwall mining operations in such a manner as to minimize surface disturbance while mining within the 15-degree angle-of-draw area that includes the South Fork stream channel. This will be accomplished by advancing the longwall on a schedule where mining will not be suspended for a period to exceed 48 hours.

A bi-weekly (once every two weeks) report on the impacts to stream flow and required mitigation, if any, will be submitted via e-mail to the Division and the forest detailing the results of the inspections while mining is occurring under the stream channel. The reports will include, but not necessarily be limited to: a map illustrating the current location of the longwall face; descriptions and dates of field activities; noted changes in stream and local geomorpholgy; location, width, frequency of cracks; and a description of repairs, if any, conducted. If the prescribed inspections cannot be conducted, the reason for the missed inspection and a record of the attempt to conduct the inspection will be submitted to the Division and the forest in the report. The Division and the forest will be notified immediately after mining-induced cracks, if any, are found in the South Fork stream channel and the steps taken or planned to be taken as mitigation. Thereafter, the Division and the forest will be advised of continuing mitigation efforts, if needed, in the report.

Though not anticipated, short segments of Cowboy Creek could be subsided in the SITLA Muddy Tract. If this is anticipated to occur, Sufco, will submit a plan for mitigation to address, if it occurs, adverse impacts to Cowboy Creek. With the approval of the Division and concurrence of the Forest, Sufco will instigate a flow monitoring plan similar to the plan implemented prior to the undermining of the East Fork of Box Canyon. If mitigation of surface cracks are required, methods similar to those proposed and implemented in the East Fork of Box Canyon as described above could be used.

Mining within the area of the East Fork of the Box Canyon, South Fork of Quitchupah and within the area of Cowboy Canyon in the SITLA Muddy Tract will be conducted in accordance with State and Federal rules and regulations and the requirements and stipulations presented in the BLM's

# CHAPTER 7

# HYDROLOGY

1. Determine if ground water discharge in the area of Pines 105 and Joes Mill Pond springs continue to discharge to the alluvium;
2. Monitor and evaluate the effects of mining on the surface and subsurface water in the Pines 310 and Pines 311 spring areas; and
3. Determine the potential for completing and operating ground water wells in the spring areas as part of the spring site mitigation activities.

The piezometers/wells completed as part of this project will be monitored on a bi-weekly basis through December 2006 or as accessible. Transducers with data loggers will be placed in several of the piezometers to record data on a more continuous basis. The monitoring frequency of the piezometers/wells after December 2006 will be dependant upon the results of the drilling investigation and the impacts to springs Pines 310, 311, 105, and the Joes Mill Pond of mining the 6LPE panel in the fall and winter of 2006.

A report detailing the results of the drilling and piezometer/ well installation and completion will be submitted to the Division by the end of October 2006. Water level data collected from the piezometers/wells will be reported to the Division electronically within two weeks at the end of each the month through December 2006. The Division will also be notified within three days via e-mail or telephone of significant changes to ground water elevations in Pines 310, 311, 105 spring areas as the 6LPE longwall panel is mined. A report compiling the water level data and interpretation of the data will be submitted to the Division by the end of January 2007.

Based on the findings of the investigation, Sufco will submit to the Division either additional plans (if water is not found in the Pines 105 and Joes Mill Pond area, additional bedrock drilling may be required to locate a suitable source of ground water) or a final plan for mitigation of the effected spring areas.

South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B" Monitoring and Mitigation Plan

A monitoring and mitigation plan that is more intensive than the general Mining and Reclamation Plan area has been proposed for monitoring water flows, subsidence cracks, and repair of the cracks in the portions of the South Fork of Quitchupah channel to be undermined. This plan is outlined below.

Prior to the initiation of undermining and subsidence, a pre-subsidence survey of the stream channel will be conducted in the portion of South Fork of Quitchupah that flows over the 2R2S Block "A" and 3R2S Block "B" panels and associated gate roads. The survey will consist of a gain/loss survey of flow within the stream channel paying particular attention to surface flows and ground water discharge, soil conditions, and the general channel geomorphology. A similar study was performed in the past but all stream measurements were not conducted on the same date. The second gain/loss survey will be completed on a single day at or near base flow conditions late in the summer or early fall of 2011. The mine will attempt, as part of this second survey, to occupy the same monitoring sites in the panel area as those chosen in the initial survey.

Two weeks before and then once every two weeks after subsidence mining begins, the measuring locations occupied during the gain/loss survey will be reoccupied and flow measurements of the stream flow will be obtained. The approximate locations of these sites are illustrated on Figure 7-9. The once every other week flow measurements will be supplemented by visual observations of flow performed twice a week or once every three to four days. Flow/no flow conditions will be described on these days. If no flow or diminished flows are noted, the appropriate mine and Forest personnel will be contacted and the mitigation plan to restore flows will be implemented.

Semi-weekly flow observations and visual inspections will continue for at least 12 weeks, or as conditions allow, after the completion of mining under the stream channel. The bi-weekly (once every two weeks) stream flow monitoring will continue for at least four weeks, or as conditions and monitoring results indicate necessary, after the completion of subsidence mining under the stream channel. The monitoring plan will then change to quarterly flow and field parameter measurements for two years at four sites: one upstream of the panel, one within the panel, and two downstream of the panel. The location of these new temporary monitoring sites are listed in Table 7-2 and shown on Plate 7-3 and labeled as sites 006A, 006B, 006C and 006D. Additional flow monitoring may be needed to determine specific locations where flow is being lost, and treatments are needed.

The subsidence monitoring plan for the South Fork of Quitchupah will include frequent inspection of the stream channel during and after active subsidence. While mining is occurring under the stream

the staging areas to the nearby work sites either by hand, the use of pack animals, or by helicopter. This work will be done with a contractor selected after consultation with the Forest Service.

Additionally, it may be required to remove loose rock from the channel floor, either where the channel flows across thin-bedded bedrock or where large rock have fallen into the channel and is impeding flows. In the instance of the former, past experience has shown this can occur in the upper Blackhawk Formation and is easily repaired by removing enough of the broken channel surface to again expose the stream flow. In the instance of the later, removal of large rocks could be accomplished by drilling and then fracturing the rock into smaller fragments more easily moved to locations were they are not impeding flow. This work may be completed using available pneumatic or hydraulic tools that do not require road or pad building disturbances. In the unlikely event that large boulders do need to be moved, pumps and tanks necessary to complete the work will be located in pre-disturbed areas, such as roads or turnouts, and hoses will be walked into the work area.

Sufco will conduct longwall mining operations in such a manner as to minimize surface disturbance while mining within the 15-degree angle-of-draw area that includes the South Fork stream channel. This will be accomplished by advancing the longwall on a schedule where mining will not be suspended for a period to exceed 48 hours.

A copy of the ~~2012~~ "Monitoring and Mitigation Plan for Undermining the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B" has been included in Appendix 3-14. The preceding paragraphs have been prepared based on this plan. Sufco will meet all of the monitoring and mitigation responsibilities described in the plan as it pertains to the undermining of the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B".

A bi-weekly (once every two weeks) report on the impacts to stream flow and required mitigation, if any, will be submitted via e-mail to the Division and the Forest detailing the results of the inspections while mining is occurring under the stream channel. The reports will include, but not necessarily be limited to: a map illustrating the current location of the longwall face; descriptions and dates of field