

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

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July 19, 2005

TO: Internal File

THRU: D. Wayne Hedberg, Permit Supervisor

FROM: Steve Fluke, Reclamation Hydrogeologist/Team Lead

RE: SITLA Muddy Lease Amendment, Canyon Fuel Company, LLC., SUFCO Mine, C/041/0002, Task ID #2157

### **SUMMARY:**

On February 11, 2005, The Division of Oil, Gas and Mining (the Division) received an amendment to include the SITLA Muddy Creek Tract to the Mining and Reclamation Plan (MRP) for the SUFCO Mine. The Lease area adds 2,134.19 acres to the existing approved permit area of 24,632.95 acres. No new surface disturbance is proposed as a result of the additional lease area. The application was assigned Task ID #2157 by the Division. This memo addresses the hydrology section of the amendment review.

Hydrologic information provided in the amendment does not meet the requirements of the Coal Mining Rules. The proposed amendment should not be approved until the following deficiencies are addressed:

**R645-301-724.** The Permittee needs to include the hydrologic baseline data presented in “Muddy Creek Tract: Surface and Groundwater Technical Report” prepared by Cirrus Ecological Solutions, LC, for the Manti-La Sal National Forest. Although the lease amendment references the report in Section 7.3.1.2, Water Monitoring, the baseline data is not presented in the MRP. The baseline data for the SITLA Muddy Tract should be included in the MRP; ideally as part of a separate appendix that includes a determination of Probable Hydrologic Consequences (PHC) for the SITLA Muddy Creek Tract.

**R645-301-728.** The Permittee needs to update the PHC to include the addition of the SITLA Muddy Tract. The amendment should contain a determination of PHC based on the baseline hydrologic information provided in the report prepared by Cirrus Ecological Solutions, LC. Ideally, the PHC determination along with the baseline data for the SITLA Muddy Creek Tract should be included in the MRP as a separate appendix.

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**R645-301-728.310, -728.334.** The Permittee needs to update the Probable Hydrologic Consequences (PHC) Determination to include more up-to-date current and long-term mine water discharge rates. Accurate mine water discharge information is needed in order for the PHC to make findings on: whether adverse impacts may occur to the hydrologic balance; and what impact the proposed coal mining will have on groundwater and surface water availability. This updated discharge information is also needed for the update of the Quitchupah-Muddy Creek CHIA.

**R645-301-724.100, 724.210.** At the request of the Manti-La Sal Forest Service, the Permittee needs to update the groundwater monitoring plan to include additional spring monitoring sites located further downgradient of the Muddy Creek Tract. The Forest Service requests the additional monitoring of spring M-SP18 and either one or two out of four springs located in Greens Hollow; M-SP01, M-SP02, M-SP12, and M-SP45. The additional groundwater monitoring should be based on a PHC determination for the Muddy Creek Tract.

**R645-301-722.300:** The Permittee needs to update Plate 7-3, Hydrologic Monitoring Stations, with the additional hydrologic monitoring sites for springs in Greens Hollow and spring M-SP18 located in a drainage north of Greens Hollow.

**R645-301-729:** The Permittee needs to address the hydrologic deficiencies listed in this technical memo (Task ID #2157) before the Division can update the Quitchupah-Muddy Creek, Cumulative Hydrologic Impact Area with information regarding the addition of the SITLA Muddy Creek Tract.

**TECHNICAL ANALYSIS:**

## ENVIRONMENTAL RESOURCE INFORMATION

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

## CLIMATOLOGICAL RESOURCE INFORMATION

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

### Analysis:

The application meets the hydrology Environmental Description for Climatological Resource Information as provided in **R645-301-724.400**. The Division finds that these standards are met because information on climatic resources representative of the SUFCO Mine region,

including the SITLA Muddy Creek Tract, is presented in Section 7.2.4.4, Climatological Information, of the MRP. Climatological data has been collected since 1986 at a weather station located at the mine surface facilities. Because of the localized nature of summer rainstorms in the area, a second weather station was added in 2004 to the Pines tract at the head of the East Fork of Box Canyon downstream of Joe's Mill Ponds. This station collects temperature and precipitation data and is operational from May through October. The Joe's Mill Pond weather station is located approximately one-mile east of the SITLA Muddy Creek Tract. Climatological data is submitted with the mine's annual report.

### **Findings:**

The information provided meets the minimum hydrology requirements of the Environmental Description for Climatological Resource Information of the State regulations.

## **HYDROLOGIC RESOURCE INFORMATION**

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

### **Analysis:**

#### **Sampling and Analysis**

The application meets the hydrology Environmental Description for Sampling and Analysis as provided in **R645-301-723**. The Division finds that these standards are met because, as stated in Section 7.2.3, Sampling and Analysis, of the mine's existing MRP, "all water samples collected for use in this MR&P have been analyzed according to the methods in either the "Standard Methods for the Examination of Water and Waste Water" or 40 CFR parts 136 and 434".

#### **Baseline Information**

The application does not meet the hydrology Environmental Description for Baseline Information as provided in **R645-301-724**. Hydrologic baseline data is presented in "Muddy Creek Tract: Surface and Groundwater Technical Report" prepared by Cirrus Ecological Solutions, LC, for the Manti-La Sal National Forest. The report is the result of 3.5 years of field data collection for the Muddy Tract, including the SITLA lease area, beginning in the fall of 2000. Although the lease amendment references the report in Section 7.3.1.2, Water Monitoring, the baseline data is not presented in the MRP. The baseline data for the SITLA Muddy Creek Tract should be included in the MRP; ideally as part of a separate appendix that includes a determination of Probable Hydrologic Consequences (PHC) for the SITLA Muddy Creek Tract.

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### **Baseline Cumulative Impact Area Information**

The application meets the hydrology Environmental Description for Baseline Cumulative Impact Area Information as provided in **R645-301-725**. The Division finds that these standards are met because the report prepared by Cirrus Ecological Solutions, LC, has been provided to the Division by the Manti-La Sal Forest Service. The report, in combination with the SITLA Muddy Creek Tract amendment, adequately presents hydrologic and geologic information for the cumulative impact area needed by the Division to provide an assessment of the probable cumulative hydrologic impacts.

### **Modeling**

No modeling has been included as part of the Muddy Creek Tract amendment.

### **Probable Hydrologic Consequences Determination**

The application does not meet the hydrology Environmental Description for Probable Hydrologic Consequences (PHC) Determination as provided in **R645-301-728**. The PHC was not updated to include the addition of the SITLA Muddy Creek Tract. The amendment should contain a determination of PHC based on the baseline hydrologic information provided in the report prepared by Cirrus Ecological Solutions, LC. Ideally, the PHC determination along with the baseline data for the SITLA Muddy Creek Tract should be included in the MRP as a separate appendix.

In addition, the information in the existing PHC describing mine water discharge from the mine needs to be updated to accurately describe current and long-term discharge rates. Accurate mine water discharge information is needed in order for the PHC to make findings on: whether adverse impacts may occur to the hydrologic balance (**R645-301-728.310**); and what impact the proposed coal mining will have on groundwater and surface water availability (**R645-301-728.334**). This updated discharge information is also needed for the update of the Quitchupah-Muddy Creek CHIA.

### **Groundwater Monitoring Plan**

The application does not meet the hydrology Environmental Description for Groundwater Monitoring Plan as provided in **R645-301-724.100**. The approved groundwater monitoring plan in the MRP was updated to include the addition of one spring monitoring site located within the SITLA Muddy Creek Tract (M-SP53), two spring monitoring sites located adjacent to the SITLA Muddy Creek Tract (M-SP08 and M-SP39), and one monitoring well site located within the SITLA Muddy Creek Tract (01-8-1). The spring monitoring sites are to be monitored quarterly for flow and field parameters and the groundwater monitoring well site is to be

monitored quarterly for water levels. In addition, one spring monitoring site (GW-13) located within the SITLA Muddy Creek Tract is part of the existing SUFCO Mine groundwater monitoring plan. Following their review of the amendment and consultation with the Division, the Manti-La Sal Forest Service has requested the additional monitoring of springs located further downgradient of the proposed area to be mined. The Forest Service requests the additional monitoring of spring M-SP18 and either one or two out of four springs located in Greens Hollow; M-SP01, M-SP02, M-SP12, and M-SP45. The additional groundwater monitoring should be based on a PHC determination for the Muddy Creek Tract.

### **Surface-Water Monitoring Plan**

The application meets the hydrology Environmental Description for Surface Water Monitoring Plan as provided in **R645-301-724.200**. The Division finds that these standards are met because the approved surface water monitoring plan in the MRP was updated to include the addition of one stream monitoring site (M-STR5) located downstream of the proposed permit boundary in Cowboy Creek. Cowboy Creek is a perennial stream that flows through a portion of the northwest corner of the SITLA Muddy Creek Tract. There are no other perennial or intermittent streams to monitor within the proposed permit area. As stated in the Division's engineering technical memo for this review (Task ID# 2157), the SUFCO Mine must make a commitment to submit a mitigation plan prior to conducting full extraction mining beneath Cowboy Creek (**R645-301-525.480**).

### **State Appropriated Water Rights**

The application meets the hydrology Environmental Description for State Appropriated Water Rights as provided in **R645-301-724.100, -724.200**. The Division finds that these standards are met because the water rights summary (Appendix 7-1, Water Rights Data) has been updated with water rights located within and adjacent to the SITLA Muddy Creek Tract. There are thirteen water rights listed by the Utah Division of Water Rights (DWR) within the SITLA Muddy Creek Tract: five are for stockwatering directly on a spring; five are for stockwatering directly on a stream; and three are for stockwatering directly on a reservoir (stockwatering pond). The United States Forest Service owns all of the water rights listed.

### **Findings:**

Hydrologic Resource Information does not meet the minimum requirements of the Coal Mining Rules. Before the application can be approved, the following deficiencies should be addressed:

**R645-301-724**, The Permittee needs to include the hydrologic baseline data presented in "Muddy Creek Tract: Surface and Groundwater Technical Report" prepared by Cirrus Ecological Solutions, LC, for the Manti-La Sal National Forest. Although

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the lease amendment references the report in Section 7.3.1.2, Water Monitoring, the baseline data is not presented in the MRP. The baseline data for the SITLA Muddy Tract should be included in the MRP; ideally as part of a separate appendix that includes a determination of Probable Hydrologic Consequences (PHC) for the SITLA Muddy Creek Tract.

**R645-301-728**, The Permittee needs to update the PHC to include the addition of the SITLA Muddy Tract. The amendment should contain a determination of PHC based on the baseline hydrologic information provided in the report prepared by Cirrus Ecological Solutions, LC. Ideally, the PHC determination along with the baseline data for the SITLA Muddy Creek Tract should be included in the MRP as a separate appendix.

**R645-301-728.310, -728.334**, The Permittee needs to update the Probable Hydrologic Consequences (PHC) Determination to include more up-to-date current and long-term mine water discharge rates. Accurate mine water discharge information is needed in order for the PHC to make findings on: whether adverse impacts may occur to the hydrologic balance; and what impact the proposed coal mining will have on groundwater and surface water availability. This updated discharge information is also needed for the update of the Quitchupah-Muddy Creek CHIA.

**R645-301-724.100**, At the request of the Manti-La Sal Forest Service, the Permittee needs to update the groundwater monitoring plan to include additional spring monitoring sites located further downgradient of the Muddy Creek Tract. The Forest Service requests the additional monitoring of spring M-SP18 and either one or two out of four springs located in Greens Hollow; M-SP01, M-SP02, M-SP12, and M-SP45. The additional groundwater monitoring should be based on a PHC determination for the Muddy Creek Tract.

## 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:

#### Monitoring and Sampling Location Maps

The application does not meet the hydrology Maps, Plans, and Cross Sections of Resource Information for Monitoring and Sampling Location Maps as provided in **R645-301-722.300**. Additional groundwater monitoring sites have been requested by the Manti-La Sal

Forest Service for springs in Greens Hollow and spring M-SP18 located in a drainage north of Greens Hollow. Plate 7-3, Hydrologic Monitoring Stations, should be updated with the additional monitoring sites once they have been established.

### **Subsurface Water Resource Maps**

The application meets the hydrology Maps, Plans, and Cross Sections of Resource Information for Subsurface Water Resource Maps as provided in **R645-301-722.100**. The Division finds that these standards are met because Plate 7-1, Potentiometric Surface of the Blackhawk/Starpoint Aquifer, shows the potentiometric of the regional aquifer for the SUFCO Mine area. The plate does not need to be updated to include the Muddy Creek Tract because the plate shows groundwater elevations from 1989 prior to progression of mining that has caused several wells to be abandoned. One groundwater monitoring well (01-8-1) was added to the Muddy Creek Tract in 2001. However, the inclusion of groundwater elevation data from this well would not provide a more complete potentiometric surface map of the regional aquifer than the 1989 data provides given the fewer number of wells now available.

Plate 7-2B, Surface and Groundwater Rights, Pines and SITLA Muddy Creek Tracts, has been updated to include the water right locations for the SITLA Muddy Creek Tract and adjacent areas.

### **Surface Water Resource Maps**

The application meets the hydrology Maps, Plans, and Cross Sections of Resource Information for Surface Water Resource Maps as provided in **R645-301-722.200**. The Division finds that these standards are met because the location of surface-water bodies within and adjacent to the permit area is presented on Plate 7-2B, Surface and Groundwater Rights, Pines and SITLA Muddy Tract, and Plate 7-3, Hydrologic Monitoring Stations. Both plates have been updated to include the SITLA Muddy Creek Tract and adjacent areas.

### **Well Maps**

No oil, gas or water wells exist within the SITLA Muddy Creek Tract.

### **Findings:**

Maps, Plans, and Cross Sections of Resource Information does not meet the minimum requirements of the Coal Mining Rules. Before the application can be approved, the following deficiencies should be addressed:

**R645-301-722.300:** The Permittee needs to update Plate 7-3, Hydrologic Monitoring Stations, with the additional hydrologic monitoring sites for springs in Greens Hollow and spring M-SP18 located in a drainage north of Greens Hollow.

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## OPERATION PLAN

### 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, -300-148, -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:

##### Groundwater Monitoring

The application does not meet the hydrology Environmental Description for Groundwater Monitoring Plan as provided in **R645-301-724.210**. The approved groundwater monitoring plan in the MRP was updated to include the addition of one spring monitoring site located within the SITLA Muddy Creek Tract (M-SP53), two spring monitoring sites located adjacent to the SITLA Muddy Creek Tract (M-SP08 and M-SP39), and one monitoring well site located within the SITLA Muddy Creek Tract (01-8-1). The spring monitoring sites are to be monitored quarterly for flow and field parameters and the groundwater monitoring well site is to be monitored quarterly for water levels. In addition, one spring monitoring site (GW-13) located within the SITLA Muddy Creek Tract is part of the existing SUFCO Mine groundwater monitoring plan. Following their review of the amendment and consultation with the Division, the Manti-La Sal Forest Service has requested the additional monitoring of springs located further downgradient of the proposed area to be mined. The Forest Service requests the additional monitoring of spring M-SP18 and either one or two out of four springs located in Greens Hollow; M-SP01, M-SP02, M-SP12, and M-SP45. The additional groundwater monitoring should be based on a PHC determination for the Muddy Creek Tract.

##### Surface Water Monitoring

The application meets the hydrology Environmental Description for Surface Water Monitoring Plan as provided in **R645-301-724.200**. The Division finds that these standards are met because the approved surface water monitoring plan in the MRP was updated to include the addition of one stream monitoring site (M-STR5) located downstream of the proposed permit boundary in Cowboy Creek. Cowboy Creek is a perennial stream that flows through a portion of the northwest corner of the SITLA Muddy Creek Tract. There are no other perennial or

intermittent streams to monitor within the proposed permit area. As stated in the Division's engineering technical memo for this review (Task ID# 2157), the SUFCO Mine must make a

commitment to submit a mitigation plan prior to conducting full extraction mining beneath Cowboy Creek (**R645-301-525.480**).

### **Diversions: Perennial and Intermittent Streams**

No diversions of perennial and intermittent streams are proposed for the SITLA Muddy Creek Tract. No new disturbed surface areas are proposed for the additional lease area.

### **Stream Buffer Zones**

The application meets the hydrology Operational Plan for Stream Buffer Zones as provided in **R645-301-731.600**. No surface mining within 100 feet of a perennial or intermittent stream is proposed for the SITLA Muddy Creek Tract.

### **Findings:**

Hydrologic Information of the Operation Plan does not meet the minimum requirements of the Coal Mining Rules. Before the application can be approved, the following deficiencies should be addressed:

**R645-301-724.210.** At the request of the Manti-La Sal Forest Service, the Permittee needs to update the groundwater monitoring plan to include additional spring monitoring sites located further downgradient of the Muddy Creek Tract. The Forest Service requests the additional monitoring of spring M-SP18 and either one or two out of four springs located in Greens Hollow; M-SP01, M-SP02, M-SP12, and M-SP45. The additional groundwater monitoring should be based on a PHC determination for the SITLA Muddy Creek Tract.

## **RECLAMATION PLAN**

### **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**

The application meets the Reclamation Plan for the Hydrologic Reclamation Plan as provided in **R645-301-731.600**. No update to the existing hydrologic reclamation plan was submitted because no new surface disturbance is planned for the SITLA Muddy Creek Tract.

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**Findings:**

The information provided meets the minimum hydrology requirements for the Reclamation Plan of the State regulations.

## **CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT**

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-729.

**Analysis:**

The application does not meet the requirements of the Cumulative Hydrologic Impact Assessment (CHIA) as provided in **R645-301-729**. The Division needs to update the Quitchupah-Muddy Creek, CHIA to incorporate the addition of the SITLA Muddy Creek Tract. The hydrologic information provided in the application is not adequate to update the CHIA. The hydrologic deficiencies listed in this technical memo need to be addressed by the Permittee before CHIA can be updated.

**Findings:**

The Cumulative Hydrologic Impact Assessment Information does not meet the minimum requirements of the Coal Mining Rules. Before the application can be approved, the following deficiencies should be addressed:

**R645-301-729:** The Permittee needs to address the hydrologic deficiencies listed in this technical memo (Task ID #2157) before the Division can update the Quitchupah-Muddy Creek, Cumulative Hydrologic Impact Area with information regarding the addition of the SITLA Muddy Creek Tract.

**RECOMMENDATIONS:**

Hydrologic information provided in the application does not meet the requirements of the Coal Mining Rules. The proposed amendment should not be approved at this time.