



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

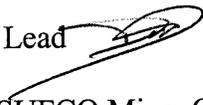
1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340 telephone
(801) 359-3940 fax
(801) 538-7223 TTY
www.nr.utah.gov

Michael O. Leavitt
Governor
Robert L. Morgan
Executive Director
Lowell P. Braxton
Division Director

OK

December 16, 2002

TO: Internal File

FROM: David Darby, Senior Reclamation Specialist, Team Lead 

RE: Link Canyon Portal, Canyon Fuel Company, LLC, SUFCO Mine, C041/002-AM02E-2 and AM02E-3

SUMMARY:

This review evaluates the third and fourth submittals prepared by Canyon Fuel Company, Sufco Mine. The Link Canyon portal amendments were received November 26, 2002 and January 6, 2003. The Division received the original amendment on April 8, 2002 to re-open and develop main entries in the abandoned Link Canyon mine and a second modified submittal on August 12, 2002. The Division completed the first Technical Analysis on July 18, 2002 and the second on November 1, 2002. Prior to the Division making a findings of adequacy on the second amendment update (third submittal), Sufco submitted a third update (4th submittal) to the Division, which included hydrologic information from a U.S. Geological Report and surveys from Mr. Eric Petersen, Hydrologist for Petersen Hydrologic, Inc.

Development of the portal will allow access to the existing SUFCO mine through the old Link Canyon mine workings. The portal is needed to provide intake ventilation, emergency escape, and power to the Pines Tract mining area. Power will be supplied from the electrical power substation located just opposite the road from the proposed portal. The Link Canyon Mine was closed in 1960. It was a pre-SMCRA site that had been sealed by collapsing the portals.

It is planned that the Lila Canyon Portal will be used over the next 8 to 10 years. The proposed new portal area will be 0.23 acre in size, with 0.14 acre of actual disturbance. The entire area is contained within the present approved Permit Area. The new disturbance will include a 120-foot road and a power line to the Link Canyon substation.

TECHNICAL MEMO

Link Canyon hydrologic system was previously evaluated as a part of the Pines Tract Lease. A hydrological evaluation for the Pines Tract Lease was conducted by Mayo and Associates in 1998. Their findings are presented in the Probable Hydrologic Consequences section in Appendix 7-18 of the MRP. Land use for the area is established for leaseable mineral development, Plate 4-1B, and high use deer and elk winter range, Plates 3-2 and 3-3.

The submittal of November 26 also contained information to address concerns expressed by the U.S. Forest Service. The Forest Service is the federal land surface management agency, because the proposed disturbance is within the Manti La-Sal National Forest.

The Utah Division of Water Quality (UDWQ) has determined that, water flowing from the portal is not process wastewater, and since it has been flowing naturally for a number of years, no UPDES discharge point will be required even if the water is kept flowing.

ENVIRONMENTAL RESOURCE INFORMATION

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

GENERAL

CLIMATOLOGICAL RESOURCE INFORMATION

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

Analysis:

The Convulsion Canyon Mine site receives an average annual precipitation of approximately 12.51 inches. Precipitation in the form of rain peaks in August with 1.65 inches being received on the average for that month. Snow covers the ground from September through May. Appendix 7-5 provides detailed climatologic information.

Findings:

The information reported meets the minimum Climatologic requirements of the Regulations.

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

Sampling and Analysis

The applicant identifies four springs at the head of Link Canyon. Springs 100, 101, 102 and GW-21. Spring GW-21 is a U.S. Geological Survey monitoring site, S.A.Thiros and G.E. Cordy, 1991. The site was monitored over a two year period from June 1979 to September 1980 and again during a two year period from July 1986 to September 1987. The applicant has supplied information from the USGS Report, which characterize the flows and quality of headwaters, Figures 3, 4 and 7 and Tables 2 and 3, Appendix 7-18 MRP. These springs are located in the Castlegate Sandstone.

Tritium dating of springs 100 and 103 in the Castlegate Sandstone identify the recharge source as less than 50 years old. Based on comparison of tritium and radiocarbon compositions in near-surface groundwaters, Mayo and Associates determined that a hydrologic disconnect exists. The cause of the disconnect is attributed to shale and mudstone in the Blackhawk Formation, which hinder the downward migration of water. The flux of water in the Castlegate Sandstone is strongly dependant on surface recharge events as indicated by isotopic and discharge hydrograph data. Without seasonal surface precipitation, discharge from the Castlegate Sandstone water sources would quickly be reduced.

The Link Canyon Mine is located in the lower Blackhawk Formation. There are two old collapsed portals, the west and east. Small volumes of water flow from both portals. The applicant proposes to enter the west portal. The U.S. Geological Survey monitored the flow from the proposed portal site nine times from July 15, 1986 to September 8, 1987. The site is identified as GW-22. Measured flows did not exceed 2.2 gpm. Field parameters were analyzed with each collection. One complete chemical analysis was conducted on a sample taken July 15, 1986. Another water sample was collected from the western portal, Site GW-22, on September 19, 1998 by Mayo and Associates during the Pines Tract EIS procedure. Field parameters showed the flow to be about one gallon per minute, the pH was 7.3, the conductivity was 880 mmhos and the water temperature 12.8 degrees Celsius, Table 1, Appendix 7-18.

The U.S. Forest Service requested additional sampling prior to portal development. Sufco collected six samples (each) at both portals during September, October and November, 2002, one sample from each portal was obtained and analyzed. Chemical analyses were conducted on the samples, Appendix 7-4. They are provided in the Petersen Hydrologic report in Table 1 and Table 2. There are no wells in the Link Canyon amendment area.

Baseline Information

Sufco presents baseline water quantity and quality data for springs and mine discharge from the Link Canyon Drainage. They have identified segments of the channel within the drainage showing the types of flows, vegetation types, slope and ecosystems. The hydrologic

TECHNICAL MEMO

information mentioned above is sufficient to characterize the drainage. The drainage is typically ephemeral with segments of perennial flow below spring sources at the base of the Castlegate Sandstone and mine water discharge at the Link Canyon Portals. Data shows the flows from the springs and portal are low, ranging mostly below 5 gallons per minute. Water quality is relatively good with moderate elevated levels of total dissolved solids, sulfate and magnesium. Most metals are very low and no oil or grease observed. Bicarbonates are moderately high and act as a buffering agent to keep pH near 7. A redish-orange algae is present in some of the discharge, which is not uncommon to low flowing surface waters.

Baseline Cumulative Impact Area Information

The impact area is established by the regulations, limiting physical impacts from mining to the permit area. The cumulative impact area is established to include impacts from all coal mining operations in a major drainage or designated area. A Cumulative Hydrologic Impact Assessment has been completed already for the Quitchupah and Pines Tract Leases. The Link Canyon amendment lies within the Pines Tract Lease. A cumulative impact area has been established in the CHIA to include potential impacts of the Link Canyon Portals as well as Sufco Mine operation, See Quitchupah and Muddy Creeks CHIA, June 14, 2002.

Modeling

No modeling has been conducted. Hydrologic structure design is however, based on the imperial formulas the Soil Conservation Service, now the Natural Resources Conservation Service, established for runoff and erosion volumes.

Probable Hydrologic Consequences Determination

The Link Canyon Mine probable hydrologic consequences, PHCs, are described in Chapter 7 of the MRP. Mayo and Associates, Appendix 7-18 of the MRP supplied most information used to establish the PHC in a report. Information specific to the Link Canyon Mine was submitted as part of the amendment. Baseline information shows two main sources of water in Link Canyon. Four springs at the headwaters emanate from the base of the Castlegate Sandstone, all yield low flow rates, Table 2, Appendix 7-18. One has a water right and is developed for cattle watering. The other source is the low flows that come from the mine portals. The channel eventually empties into Quitchupah Creek in south of the town of Emery.

Flow from the springs saturate an area 300 to 750 feet in length below the source depending on the season, supporting riparian vegetation. The flows disappear from evapotranspiration and infiltration along the channel. Below the riparian area, the channel becomes ephemeral, flowing only in response to snowmelt or rainfall. The channel is steep and exhibits cliffs and overhangs. There is no riparian vegetation along this section of the channel.

The Link Canyon Mine supplies another water source to the channel, from small

discharges from the two portals. Flow from each portal sustains small riparian areas along the channel. The channel only flows as a result of snowmelt or rainfall. The applicant provides information to characterize the channels by supplying information defining the slope of the channel, wildlife inhabitants and vegetation types along the channel, which are consistent with an ephemeral drainage. Depending on the time of year and rate of precipitation the flows can extend down no more than 500 feet, riparian vegetation ranges to about 800 feet below the mine. The flows gradually disappear as a result of evapotranspiration or infiltration. The remainder of the channel from the riparian area to Quitchupah Creek changes to ephemeral again, which the operator has identified by the vegetation types.

No fishery is associated with any of the riparian areas. A recent amphibian study revealed no inhabitants. The groundwater flows mainly support the riparian vegetation, which is a shelter for some small animal species, mainly birds. The flow likely supplies a drinking water source for some species.

The applicant identifies no impacts as a result of mining. The springs at the head of Link Canyon will not be impacted, since no mining is planned beneath the springs. Flow from the portal to the riparian area will be interrupted as the entries are developed through the Link Canyon Mine and the recovery period of the mine inflow. The interruption is planned for the winter months while the riparian zone is dormant. The eastern half of the Link Canyon Mine will be sealed with the development of the Link Canyon Mine entries.

Water levels will reestablished in the eastern half of the Link Canyon Mine. The applicant states in the amendment that if recharge is slow, then the eastern half of the mine will be refilled to almost an overflow level. No mine water discharges will occur from pumping, however, it is planned that water entering the mine naturally will overflow. There will be commingling of water that refills the mine naturally with water pumped in to refill the mine void. The water that will be pumped into the mine will be the same water that would be discharged from the UPDES discharge point in Quitchupah Creek. The renewed discharges from the Link Canyon portals should not be degraded.

The above information was discussed with Mike Herkimer on January 13, 2003. The operator had met with the UDWQ almost a year ago to describe the procedure. UDWQ stated that a UPDES discharge point would not be necessary if no mine water was discharged from the site or that water quality was diminished. Water will free flow from both portals. The applicant will place a drain into the east section that provide flow to the western portal and reestablish drainage to the creek. Both discharges are planned for quarterly monitoring. The creek will also be monitored above and below the portal area, at 001 and 002.

At reclamation, flows from the western half of the Link Canyon Mine will be restored to the riparian area. The mine will be sealed at the surface and at the connection with the main mine. The applicant has submitted typical sealing plans in Chapter 5 of the MRP. The seals will be built by cutting a keyway into the sides of the entry, then pumping a concrete grout into 4'

TECHNICAL MEMO

thick forms. Then the seals will be backfilled with 25 feet of material fill. A drain will be inserted into the seal at the surface.

The applicant has submitted hydrologic design plans to control runoff from the undisturbed area above the disturbed area and contain and treat runoff at the disturbed area. The area is small, so large sediment control structures, such as a sedimentation pond, is not needed. The applicant plans to contain sediment on site with silt fences and berms. Undisturbed runoff will be diverted away from the disturbed area by two ditches. Sizing calculation for the ditches are presented in Appendix 7-12. It will be directed into the channel and flow under the disturbed area via two 36 inch culverts. The designs have been checked to ensure they meet regulatory requirements. The use of these hydrologic structures will prevent downstream impacts from mining operations.

Groundwater Monitoring Plan

The applicant has submitted water monitoring information collected by the U.S. Geological Survey for one spring at the head of Link Canyon and at the west Link Canyon portal., Water-Resources Investigations Report 90-4084. The data was collected a various intervals. Data from one spring (GW-21) in the upper reaches of Link Canyon was collected in 1979 and 1980, and again in 1986 and 1987. Data from the Link Canyon Mine (GW-22) was collected in 1986 and 1987. Additional information was presented showing the portal was monitored again in September 1992, and recently, in October and November of 2002.

The springs in the headwaters of Link Canyon emanate from the Castlegate Sandstone, whereas the water flowing from the mine portal area emanate from the Blackhawk Formation. All data indicated that flows are low at GW-21 ranging between 0.2 to 1.1 gpm. In recent years GW-21 has been developed for cattle watering. The cattlemen have piped the flows to a trough and installed a fence around the spring.

The applicant plans to continue the water monitoring during the operational and reclamation phases of mining. Since water flows from both portals, the operator believes that the mine is flooded. The applicant drilled a 2 inch vertical borehole to test the water level in the Link Canyon Mine on October 15, 2002. The hole extended from the Pines East Mains, crosscut #24, into the Link Canyon Mine. The hole was drilled 3 feet off the ground, at an upward angle. The drill should have raised 8 feet when it contacted the Link Canyon Mine. No water was contacted. The applicant registered an oxygen content of 18 percent, indicating that air is moving into the mine, possibly from fractures near the caved entrances. This does not mean that the mined is not flooded, but it does mean that the mine is not completely flooded. The drill hole could have entered near the roof of the mine.

Surface-Water Monitoring Plan

Water monitoring data has been submitted to characterize the seasonal flows at the

springs and portal discharges, Appendix 7-4. The applicant has submitted a plan to continue monitoring flows on a quarterly basis for some of the springs and the portal discharges. The applicant will also monitor the channel above and below the disturbed area.

Findings:

The information provided in the application is adequate to meet the minimum Hydrologic Information requirements of the regulations.

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, -300-147, -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:

General

The proposed new portal area is 0.23 acre in size, with an estimated 0.14 acre actually to be disturbed and needing reclamation. The entire area is contained within the presently approved Pines Tract Permit Area. The access road to the pad and portal area branches off the Link Canyon Road for a maximum distance of about 200 feet. Link Canyon Road is a public road. The road and portal will be constructed by simple cut and fill methods. There is a small riparian area below at the old portal, about 40 feet by 50 feet or 0.05 acre. The source of this water is believed to originate from two possible sources. It may be spill over water that is percolating into the old Link Canyon Mine from overlying strata, groundwater infiltration. This is believed most likely. The second possible source is a spring located at the portal. Opening the portal may reveal the water source. Water flows to the riparian areas range have been shown to flow no more than 2.2 gallons per minute. During the mid to late summer of 2002, the flows from the mine were not visible.

Surface-Water Monitoring

The applicant has submitted plans to monitor the channel in Link Canyon during the operational phase above, monitoring site Link 001, and below, monitoring site Link 002, and the disturbed area, Plate 7-3.

TECHNICAL MEMO

Discharges into an Underground Mine

Water is believed to have filled the old Link Canyon Mine to a point where it overflows. The Operator proposes to remove this water during rehabilitation of the entryway. Water will be removed by draining it into the Sufco Mine, then discharging it via UPDES site 003, which is an existing discharge point from the SUFCO workings. UPDES site 003 discharges into Quitcupah Creek. During rehabilitation of the mine entryway, seals will be placed in the mine, which will separate the eastern half of the mine from the working area. The sealed area will contain and restore the reservoir that supplies the mine discharge to the eastern riparian area. Some water may have to be pumped from the operating mine to replenish the water level in the east Link Canyon Mine.

Underground water is expected to continue flowing from the Link Canyon mine after construction. The applicant wants to implement construction of the Link Canyon entry during the winter months when the riparian vegetation is more dormant and the depletion of water will have less impact on the riparian area. After the entry is complete, the applicant proposes to implement a water collection system that will allow water collecting in the Link Canyon mine to drain the old portal site. It is worth noting that when the Pines Tract lease was evaluated for mining, the U.S. Forest Service developed an Environmental Impact Statement. That EIS anticipated a larger mine in this area. Further, that new minesite was assumed to completely destroy the riparian areas below the portal area. This would have meant no water flows for the life of the new mine. The proposed plans will keep the riparian areas, and the flows will be maintained during the operation of the mine and will be restored at reclamation.

Diversions

Plate 5-2F shows two undisturbed drainage diversion ditches, Channel 1 and Channel 2, leading to silt fences then to the main undisturbed drainage channel. These ditches have been designed with consideration of the runoff of the road and pad areas, each about 0.04 acres respectively. The resulting flows of 0.02 cfs are minimal. During the previous review it was found that the undisturbed channels were not designed to include some of the undisturbed drainage originating outside the disturbed area, contributing water to these ditches. The ditches have been redesigned to accommodate these undisturbed drainage contribution. The ditches were designed using a 10-year, 6-hour design storm, which is appropriate for a temporary diversion on an intermittent stream. The diversion ditches have 0.3 foot of freeboard, which is adequate design.

The operator plans to install two 36 inch culverts under the disturbed area to convey undisturbed area storm runoff under the area. The culverts are designed for the 25-year, 6-hour storm and the design used the 776-acre drainage area above the inlet to the culvert. During the first technical review, some concerns were expressed about the values used in calculating flow. Since the culvert is designed for the 25 yr.-24 hr. precipitation event, and will likely be used for at least a 10 year period, the probability that the design standards will be equaled is greatly

reduced. Although there is no threat to life or property, the Division wanted a larger culvert to ensure a higher confidence factor in protecting the pad and ensuring the design condition is not exceeded, given the steep terrain and paucity of ground cover. The USFS has also (independently) determined that a culvert designed to transmit flows of a 25 yr.- 24 hr. precipitation event should be installed under the portal pad. They have identified this as a deficiency that has been remedied.

Stream Buffer Zones

Measured from a point just above the Link Canyon Mine, the drainage area above the new portal is 776 acres, just larger than one square mile. The area of one square mile automatically classifies the channel as an intermittent drainage according to the coal mining regulation. Regulation R645-301-600 requires a 100 foot buffer zone adjacent to perennial or intermittent stream, unless the Division specifically authorizes coal mining and reclamation operations closer to, or through such a stream if no water quality standards will be adversely affected. The Division will require that the reaches of this drainage be protected from adverse coal mining impacts.

The applicant has presented information in the MRP and PHC to identify potential impacts to the stream channel and springs from subsidence, and to protect water quality from runoff at the disturbed area of the Link Canyon Mine pad. Plate 5-7 shows the mining plan for the Pines Tract Lease, Sufco Mine. The map shows the Pines East Mains north of the old Link Canyon mine and main entries accessing the panels Plate 7-2 shows the water rights. The U.S. Forest Service holds the water rights to the springs in Link Canyon.

The Potential Subsidence Limits Map, Plate 5-7 shows the limit of expected subsidence is includes the springs, However The springs should not be impacted from mining, because no subsidence should take place beneath or within 100 feet of the springs. The only mining beneath or adjacent to the springs will be the Pines East Mains. There will be no second mining of the mains. Also, the area adjacent to the Pines East mains will be supported by barrier pillars at the end of the longwall panel and between the 3rd Pines longwall panel and the gate road of the 4th. The depth of the overburden at the springs is about 800 feet. The applicant intends only to clean out a passageway to make an entry in the Link Canyon Mine, the area surrounding the entry should not subside. The rest of the area surrounding the Link Canyon Mine will not be mined and will remain solid rock.

The applicant plans to establish a 100 foot buffer zone along the stream channel near the disturbed area. Other than the development and installation of the culvert, no disturbance to the rest of the channel will be allowed. Stream buffer zones signs will be installed to inform personnel not to disturb the channel.

TECHNICAL MEMO

The Division finds sufficient information has been presented by the applicant to show there will be no impact or degradation of water resources as a result of developing the Link Canyon Mine as a portal and entryway. The Division hereby finds that the applicant can mine within 100 feet of Link Canyon intermittent/perennial stream channel in accordance with Regulation R645-301-600.

Sediment Control Measures

The slope adjacent to the Link Canyon Portal access road will be disturbed and excavated to create the roadway. Plate 5-2F indicates that a cut approximately six feet deep and 15 feet high will be made on the slope.

Several areas of the road and pad construction are below the road and pad. Berms at the lower end of the pad construction will protect these areas. The Plate 5-2F shows the location of silt fences. Further, the plate needs to show the direction of drainage across the road and pad to the diversion ditches. The Alternate Sediment Control Areas (ASCA) areas also need to be shown on the plate. Calculations for the ASCA areas are provided and show the silt fences should be adequate to contain sediment from the areas.

Discharge Structures

There is indication of riprap or other channel erosion protection at the outlet of the culvert, drawing in Appendix 5-2F.

Findings:

The information provided in the application meet the minimum Hydrologic Information requirements of the regulations

RECLAMATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR 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:

Gravity Discharges

The applicant has identified plans for restoration of the water flows to the existing riparian area. The applicant plans to seal the area of water recharge into the mine. Some of the areas will be sealed during entry development, which will keep flows at the eastern portal. Water will be piped from the sealed area to keep flow in the western channel below the access portal. The applicant plans to seal the mine at reclamation to prevent drainage flowing down dip as water backs up in the mine it will flow from the portals. The applicant states that the mine may have to be filled with good quality water from another part of the Sufco Mine to initiate the spill over effect, since recharge occurs at such a slow rate. By implementing this method the riparian area will not be deprived of a water source for a long time period. The applicant states that they will work with the Division of Water Quality to ensure no conflicts with UPDES standards.

The applicant states that water monitoring of the spring, mine portals and disturbed area, will continue through reclamation on a quarterly basis.

There are no expected impacts to water rights, since there will be no subsidence of springs or water that seeps into the Link Canyon Mine. The spring are located above an area that will not be second mined and are by barrier pillars. The recharge area for the springs has to come from the Castlegate Sandstone. Recharge to spring 102 is from a small area west and southwest of the spring. Recharge to springs 101, 102 and GW-21 is from the east and southeast, of the springs. Those areas have not been undermined, and will not be mined according to the submitted plans. The springs actually lie outside the area where Link Canyon Mining activities will take place. They are located in the approved Pines Tract Lease.

Findings:

The information provided in the application is considered adequate to meet the minimum Reclamation Hydrology requirements of the regulations

RECOMENDATIONS:

It is recommended that the proposed amendment be approved.