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

Michael O. Leavitt  
Governor

Kathleen Clarke  
Executive Director

Lowell P. Braxton  
Division Director

1594 West North Temple, Suite 1210

PO Box 145801

Salt Lake City, Utah 84114-5801

801-538-5340

801-359-3940 (Fax)

801-538-7223 (TDD)

October 16, 2000

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

Re: Findings for Midterm Response MT99-2, Canyon Fuel Company, LLC, Skyline Mine ,  
ACT/007/005-MT99-2, Outgoing File

Dear Mr. Meadors :

The above-referenced amendment has been reviewed and there are deficiencies that must be adequately addressed prior to approval. A copy of our technical analysis is enclosed for your information. Please respond to these deficiencies by November 13, 2000 or the Division will return your application.

If you have any questions, please feel free to call Wayne Western at (801) 538-5263, or me at (801) 538-5325.

Sincerely,

A handwritten signature in black ink that reads "Daron R. Haddock".

Daron R. Haddock  
Permit Supervisor

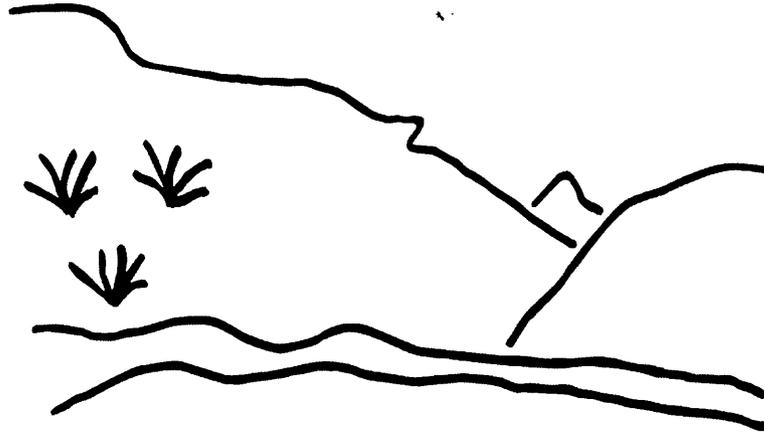
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Enclosure:

cc: Price Field Office

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# State of Utah



## Utah Oil Gas and Mining

### Coal Regulatory Program

Skyline Mine  
Midterm Review  
ACT/007/005- MT99-2  
Technical Analysis  
October 6, 2000

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**INTRODUCTION**

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## **INTRODUCTION**

On July 25, 2000, the Division received the permittee response to the midterm review for the Skyline mine. The two areas that the Division reviewed were engineering and hydrology. The permittee adequately addressed the engineering deficiencies but did not completely address the hydrology concerns. This TA contains the analysis and finding for the midterm response.

**INTRODUCTION**

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## SUMMARY OF OUTSTANDING DEFICIENCIES

The Technical Analysis regarding the proposed permit changes is not complete at this time, pending submittal of additional information by the Permittee and further review by the Division, to address outstanding deficiencies in the proposal. A summary of those outstanding deficiencies is provided below. Additional comments, concerns, and deficiencies may also be found within the analysis and finding make in the Draft Technical Analysis which have not been presented in this summary. Upon finalization of this review, any outstanding deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the Division, result in denial of the proposed permit changes, or may result in other executive or enforcement actions as deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.

Accordingly, the permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

- R645-301-121.200**, correction of the maps and drawings which make the submittal inaccurate, incomplete and difficult to understand. .... 7
- R645-301-732**, 1 ) Restore all channel freeboard to 12 inches. 2) Include the Best Technology Currently Available in the form of microenvironments for all restored stream channels. Designs for the Dugout Mine should work for this project. 3) Revise the stream channel to include a single channel designed for the 100-year, 24-hour storm. .... 12

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Revised: October 6, 2000

**SUMMARY OF OUTSTANDING DEFICIENCIES**

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**OPERATION PLAN**

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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, -300-147, -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:

The original Midterm Review sent on November 23, 1999 contained an analysis of the sediment pond, specifically detailing the problems associated with NPDES discharge violations and discharges of longwall emulsion fluids. The Operator was required to submit, "a plan to change the main minesite sediment pond to eliminate NPDES discharge violations and stop discharges of longwall emulsion fluid to the pond and/or Eccles Creek." This submittal describes a new underground water treatment system for mine discharge waters. The new system is expected to be operational by the end of the year 2000. Basically the system consists of a large underground sump which treats waters before being discharged directly to Eccles Creek. Pumps are located at the low end of the sump. Immediately near the pumps, water quality analysis equipment constantly monitors the water. In the event contaminants are detected, automatic valving routes the water away from the surface discharge pipe and back to an abandoned part of the mine. An alarm is triggered on the surface to alert mine personnel of the situation.

The underground sump has a capacity of 54 million gallons. This is nearly 18 times the volume of the existing, above-ground, sediment pond. There is an additional 30 million gallons capacity available, if needed. This sump is located in the 14L, 15L, and 16L panels, in which mining has been completed. Water developed during mining is pumped to the panel up-slope of the sump so waters drain through the mined-out gob. This is expected to filter any particulates. The large capacity sump will provide a longer settling time than the existing sediment pond. Assuming a nominal pumping rate of 1,500 gpm, there would be at least 25 days of settling time. If longwall emulsion fluid is spilled in the mine, it will be pumped to the sump also. This should provide considerable dilution of the emulsion. If pollutants do get pumped out of the sump, their concentration should be low and only rise gradually. This means no "pulse" of concentrated materials would be pumped to the surface. And they would be detected by the analysis equipment.

The pumps are expected to operate at the rate of 1,500 gpm, although they have a 3,500 gpm capacity. There is a primary pump and a secondary, back-up pump. They will be operated to prevent surges of water into Eccles Creek. The new mine pumping system also reduces the total number of pumps to about half what was previously used. This should improve reliability and reduce problems in the system. The elimination of these discharges that formerly went to the surface sediment pond will greatly reduce the hydraulic loading of that pond and this should improve the pond performance significantly. Pumping directly to Eccles Creek removes the safeguard that the sediment pond used to

provide. The analysis equipment is expected to compensate for removal of that safeguard.

The water analysis equipment is located a short distance downstream of the pumps. This constantly monitors the discharge water using a bypass line from the main discharge pipe to the equipment. The water is tested for pH, oil and grease, conductivity, and turbidity. These will be set up to automatically redirect water into Mine 3 old working should the water exceed UPDES discharge limits. The set of analysis equipment is expected to detect emulsion fluids. The system will be tested to confirm that design parameter. An alarm sounds in the mine warehouse to alert personnel if the discharge has been switched from the surface pipe to the abandoned workings pipe. Analyzers will be monitored weekly and recalibrated as needed.

There are some improvements needed to make the submittal clear and concise and understandable. First, the stream sections on Dwg, 4.4.2-1B1, Minesite Reclamation Stream Gradients are not located or labeled on Dwg. 4.4.1-1AA, Skyline Mine Reclaim Topography. While the stations are shown in the profile and the plan, it would be much easier to understand with stream sections shown on the plan view drawing. This is how it was done in the original Mining and Reclamation Plan and that should be continued here. This was pointed out in the previous Technical Memo as follows:

“The stream reaches on 4.4.2-1BA, Skyline Minesite Reclaim Topography need to be labeled. They were labeled on the original drawings Dwg. 4.4.2-1A, Mine Surface Facilities Reclamation Plan and are referenced by stream reach (A, B, etc.) on the new accompanying stream gradient drawing.”

Second, Dwg.4.4.2-1B1 was originally submitted with the major elevation lines and major station lines darkened. This is also true of the original MRP Dwg. 4.4.2-1B1. Again, this makes it much easier to read and understand the stream profiles. The drawing should be resubmitted with major elevation and station lines darkened.

Third, Stream C has discontinuous labeling of the cross-section stations. They jump from 29+00 to 34+00. The station numbering should be continuous and sequential. They should also reflect the correct cross section numbering on the other cross section drawings. This too was pointed out in the previous Technical Memo.

Fourth, the cross-sections that are concave up, stations 3+00 to 6+00 need to have the different slopes labeled on the drawing so they can be seen as different slopes.

Lastly, the Dwg. 4.4.2-1AA, Skyline Mine Reclaim Topography, in this submittal was labeled Dwg. 4.4.2-1BA, Skyline Mine Reclaim Topography, in the previous submittal. Similarly, previous Dwg. 4.4.2- AA is now labeled 4.4.2-1B and previous Dwg.4.4.2-1B is now labeled 4.4.2-1BA. It needs to be clarified which numbers apply to these drawings. The numbers will need to be consistent with the current and approved MRP.

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**OPERATION PLAN**

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**Findings:**

The proposed plan appears to meet regulatory requirements and the Division requirement for a plan to change the main minesite sediment pond to eliminate NPDES discharge violations and stop discharges of longwall emulsion fluid to the pond and/or Eccles Creek, however, in its present form, the submittal does not meet minimum regulatory requirements for being clear and concise. Accordingly, the Permittee must address those deficiencies as found within this Technical Memo and provide the following, prior to approval, in accordance with the requirements of:

**R645-301-121.200**, correction of the maps and drawings which make the submittal inaccurate, incomplete and difficult to understand.



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**RECLAMATION PLAN**

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## RECLAMATION PLAN

### APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

#### Analysis:

The permittee proposes to reclaim the mine site to meet the approximate original contours requirements; however, the site will not meet the original surface configuration. The reasons the site cannot be returned to the premining surface configuration are some premining slopes had safety factors less than 1.3 and the site will have excess fill because State Road 264 and will not be reclaimed. Some slope must have gentler slopes than originally existed. Most reclaimed slopes will have angles of 2h:1v or gentler.

The reclamation plan also calls for reclaiming all highwalls and cut slopes. Drawing No. 4.4.2-1BA and drawing No. 4.4.2-2BA show the proposed reclaimed cross sections. The highwalls are shown stations 3+00 to 10+00 and between stations 18+00 to 19+00. The steepest reclaimed highwalls will have slopes of 30° (1.7H:1V). The slopes will be feathered into the existing topography to prevent slope jumps or highwall remnants from existing.

The cross sections show that all highwalls will be eliminated. The reclaimed slopes will be feathered into the surrounding topography thus preventing any steep slopes (cut slopes) from existing after final reclamation. The Division reviewed the reclamation plan and determined that it complies with the minimum regulatory requirements for AOC.

#### Findings:

The permittee met the minimum regulatory requirements.

### BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

#### Analysis:

The Division reviewed the highwall elimination plan, contained in the midterm response, submitted on July 25, 2000. The proposed backfilling and grading plan will eliminate all highwalls and cut slopes. See drawings 4.4.2-1B and 4.4.2-1BA for details. In the text the permittee commits in Section 4.4.2 to eliminate all highwalls and cut slopes.

The reclaimed slopes, shown on drawings 4.4.2-1A and 4.4.2.1B, have straight slopes with a 2h:1v angle. Long straight slopes will erode more quickly than concave slopes or slopes with breaks. **The Division recommends that concave slopes or slopes with breaks be constructed.** However, the Division will not require the permittee to design concave slopes or slopes with breaks at this time. The permittee has the responsibility to show that all reclaimed slopes are stable (slopes that are not eroding or contributing to increased sediment loading) before Phase II bond release can be granted. If the original design cause erosion or increased sediment loading the Division will require the permittee to take corrective action that may include regrading the slopes.

The Divisions review of the slope stability analysis for the reclaimed slopes. All slopes will have a safety factor of 1.3 or greater.

#### **Findings:**

The permittee met the minimum requirements of this section.

## **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:**

##### **Sediment Control Measures**

The submittal consists of two drawings and text revisions, all of which relate to the Reclamation Plan of the Mining and Reclamation Plan (MRP). The new drawings are certified by a Registered Professional Engineer and include the following:

- 4.4.2-1B1, Minesite Reclamation Stream Gradients
- 4.4.2-1BA, Skyline Minesite Reclaim Topography

As indicated in the cover letter, the intent of the submittal is primarily to eliminate the highwalls and return the minesite to Approximate Original Contour at Reclamation. The earthwork appears to be the main consideration. There are several Hydrologic considerations that also need to be addressed. These comments are made after comparison of the original approved MRP drawings and text to the new submittals. In the MRP the following were consulted.

- Dwg 4.4.2-1B1, Minesite Reclamation Stream Gradients
- Dwg. 4.4.2-1A, Mine Surface Facilities Reclamation Plan

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**RECLAMATION PLAN**

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- Volume 5, Engineering Calculations, Section 18, Reclaimed Channel Designs

The new stream channels have a steeper slopes than the slopes in the MRP. This appears to be due to a couple of factors. First, by reading the drawings, the upstream end of the site, at the outlet of the 48-inch culvert, is 3-feet higher in the new submittal. New elevation 8693, versus old elevation 8690. In addition, the downstream end of the site, at the inlet to the 72-inch culvert, is 4-feet lower. New elevation 8546 versus old elevation 8550. The net result is that from upstream end to downstream end, the new submittal is 7- feet greater in elevation difference than the old plan. Second, the reclaimed stream channel is higher in some locations in the new plan. This appears to be an effort to bring the reclaimed slopes above the stream to a higher point, thus reclaiming further up the highwall to eliminate them. This results in some stream reaches being much steeper than the original design.

The riprap for the revised stream sections has been completely redesigned for this submittal. Comparison was made between the original MRP riprap designs and those for this submittal. As would be expected, for all channels the flow remained the same in both calculations. Other parameters compared included slope, Manning n, velocity, riprap sizing (D-85, D-50, & D-15), riprap thickness, filter sizing (D-85, & D-50), filter thickness, and freeboard. Since the comparison involved over sixteen sections of stream channel, only the results will be presented here.

The original MRP calculations were hand-done in 1989 using techniques available at the time. The new designs were based on Sedcad software which also assigns the Manning n to the stream section based on input parameters. The PADER Method, Steep Slope Design option, was used which is more conservative and appropriate for the stream slopes on this project. The freeboard design (not a function of the software) was reduced from 12 inches to 3 ½ inches for all streams. This is less protective of the stream and the freeboard needs to be restored to the originally-approved 12 inches.

Since development of the original MRP, reclamation techniques have improved and these need to be applied to this reclaimed stream design. Specifically, the stream needs to have built into it a "microenvironment" which enhances the habitat for macroinvertebrates and fish. Rather than detail those parameters here, the reader and the Operator, is referred to the Dugout Mine MRP which has such designs in the reclaimed stream channel. Canyon Fuel Company is the parent company for both mines so the information should be readily available. It's suggested that the same microenvironments approved in the Dugout Mine plan be adopted for Skyline Mine. In order to do that, the submitted design will need modification to keep the stream channel from being too narrow to implement the microenvironment. The appropriate 100-year, 24-hour design event was used to determine the flow volumes in the reclaimed stream. However, the channel cross-section has two "depths" or channels, one for the 100-year, 22-hour event and one for the 10-year, 24-hour event. This will need to be revised so the cross-section has only one channel for the larger storm. This single channel should be as wide as possible commensurate with the other design considerations, especially covering high walls and keeping concave-up slopes.

While additional riprap may be needed to accommodate the increased stream flow velocities, another option could also help the stream. The three streams, B, C, and D, all come together in a relatively short section of stream D. It's possible to construct a pool in that location to absorb the energy

of the flowing stream. This would be like a step-pool system. The post-mining land use remains the same as pre-mining, namely wildlife/grazing habitat. See page 4-1. However, in conversations with the Operator it was learned that there is consideration for using the reclaimed minesite as a Forest Service campground. In that case, the pool system would enhance the campsite. It would also enhance the habitat in the stream for fishing. The use of pools in the reclaimed site is only a suggestion, and the Operator is free to propose whatever method they deem advisable to protect the reclaimed stream channels from erosion with the new steeper slopes.

While most of the reclaimed slopes are designed at a uniform slope of 2-horizontal to 1-vertical, some are designed with a concave up configuration. These are located at stations 3+00, 4+00, 5+00, and 6+00. These slopes are steeper in the upper slope and less steep in the lower slopes. This better approximates the natural final slope of eroded areas, and the natural slope of all flowing streams. The result of a concave slope is much less erosion and better vegetation growth. Importantly, the slope is also much more stable and will be less likely to slide. The toe of the slope has more material to resist sliding and the top of the slope has less material to cause sliding. The Division is pleased that the Operator was able to include this design since it represents the Best Technology Currently Available.

#### **Findings:**

In its present form, the submittal does not meet minimum regulatory requirements. Accordingly, the Permittee must address those deficiencies as found within this Technical Memo and provide the following, prior to approval, in accordance with the requirements of:

- R645-301-732, 1 )** Restore all channel freeboard to 12 inches. **2)** Include the Best Technology Currently Available in the form of microenvironments for all restored stream channels. Designs for the Dugout Mine should work for this project. **3)** Revise the stream channel to include a single channel designed for the 100-year, 24-hour storm.