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State of Utah

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DIVISION OF OIL, GAS AND MINING

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December 12, 2000

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

Re: Approval of Midterm Review, Canyon Fuel Company, LLC, Skyline Mine, C/007/005-MT99, Outgoing File

Dear Mr. Meadors:

The Division has complete a review of your November 9, 2000 response to the Skyline Mine Midterm Review. The review is determined complete and is hereby approved. Enclosed is a copy of our technical analysis, for your information and a stamped incorporated copy of the submittal for insertion into your Mining and Reclamation Plan.

If you have any questions, please call me.

Sincerely,

Daron R. Haddock
Permit Supervisor

sm
Enclosures:
cc: Joe Wilcox, OSM
Richard Manus, BLM
Elaine Zieroth, USFS (2 copies)
Mark Page, Water Rights
Dave Ariotti, DEQ
Derris Jones, DWR
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State of Utah

Utah Oil Gas and Mining

Coal Regulatory Program

Skyline Mine
Midterm Review
C/007/005-MT99-3
Technical Analysis
December 7, 2000

TABLE OF CONTENTS

INTRODUCTION 1

OPERATION PLAN 3
- HYDROLOGIC INFORMATION 3

RECLAMATION PLAN 5
- APPROXIMATE ORIGINAL CONTOUR RESTORATION 5
- BACKFILLING AND GRADING 5
- HYDROLOGIC INFORMATION 6
  - Sediment Control Measures 6
- MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS 8
  - Final surface configuration maps 8

RULES INDEX 9

TECHNICAL ANALYSIS

INTRODUCTION

On November 23, 1999 the Division mailed to the Operator the results of its Midterm Review. After three requests for time extension, the Division received their response on March 22, 2000. The Division sent a Technical Analysis of the submittal on April 7, 2000. The Division received a response on July 25, 2000. A Technical Analysis was sent to the Operator on October 4, 2000. The Division received a response on November 9, 2000. The midterm review deals with hydrologic and highwall issues and is not all-inclusive. There are no deficiencies resulting from the review.

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.

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.

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 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 at 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 sleep 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. 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 will not be reclaimed. Some slope must have gentler slopes than originally existed.

Findings:

The permittee has 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 then 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 causes erosion or increased sediment loading the Division will require the permittee to take corrective action that may include regrading the slopes.

The Division's 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 has 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 drawings and text revisions, all of which relate to the Reclamation Plan of the Mining and Reclamation Plan (MRP). The drawings are all certified by a Registered Professional Engineer and include the following:

- 4.4.2-1B1, Minesite Reclamation Stream Gradients
- 4.4.2-1A, Skyline Minesite Reclaim Topography
- 4.4.2-1AA, Skyline Minesite As-Built
- 4.4.2-1B, and 4.4.2-1BA, Skyline Minesite Cross Sections
- 4.4.2-1AC, Eccles Creek Reclamation Details

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. Several Hydrologic considerations were also 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
- 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 steeper than the original design.

The riprap for the revised stream sections has been completely redesigned for this submittal. 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) remains at 12 inches.

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. The comparison involved over sixteen sections of stream channel. The stream reaches now have somewhat different slopes due to the revised earthwork fill. As a result, the filters and riprap changed somewhat also. The new design appears to be appropriate for all sixteen sections of stream channel.

Since development of the original MRP, reclamation techniques have improved and these have been applied to this reclaimed stream design. Specifically, the reclaimed stream has a "micro environment" which enhances the habitat for macroinvertabrates and fish. This consists of Low-Stage Check Dams and Bank-Place Boulders alternating down all the stream channels at approximately 120-foot intervals. These are the same methods approved for the Dugout Mine MRP which is also owned by Canyon Fuel Company. The reclaimed stream channel was widened from the original design to accommodate the dams and boulders.

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 been changed from the original MRP. The original design had two "depths" or channels, one for the 100-year, 24-hour event and one for the 10-year, 24-hour event. This was revised so the cross-section has only one channel for the larger storm. This is typical for reclaimed channels at Utah coal mines. This single channel is now 10-feet wide except for one short 15-foot wide section.

While riprap is used to keep stream flow velocities from eroding, 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:

The submittal meets minimum regulatory requirements.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

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

Analysis:

Final surface configuration maps

The plan for highwall elimination is presented in Section 4.4.2 and on drawings 4.4.2-1B and 4.4.2.AA. The drawings adequately show the reclamation plan and how the highwalls and cut slopes will be eliminated.

Findings:

The permittee has met the minimum requirements of this section.

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RULES INDEX

30 CFR

773.17 3
774.13 3
784.14 . . . . . 3, 6
784.15 5
784.16 3
784.23 8
784.29 . . . . . 3, 6
785.15 5
785.16 5
817.102 5
817.107 5
817.133 5
817.41 . . . . . 3, 6
817.42 . . . . . 3, 6
817.43 . . . . . 3, 6
817.45 . . . . . 3, 6
817.49 . . . . . 3, 6
817.56 . . . . . 3, 6
817.57 . . . . . 3, 6

R645

-300-140 3
-300-141 3
-300-142 3
-300-143 3
-300-144 3
-300-145 3
-300-146 3
-300-147 3
-300-148 3
-301-234 5
-301-270 5
-301-271 5
-301-323 8
-301-412 5
-301-413 5
-301-512 . . . . . 3, 5, 6, 8
-301-513 6
-301-514 . . . . . 3, 6
-301-515 6
-301-521 . . . . . 3, 8
-301-531 . . . . . 3, 5
-301-532 . . . . . 3, 6
-301-533 . . . . . 3, 5, 6
-301-536 . . . . . 3, 5
-301-537 5
-301-542 . . . . . 3, 5, 6, 8
-301-552 5
-301-553 5

-301-632 8
-301-720 3
-301-723 6
-301-724 6
-301-725 6
-301-726 6
-301-728 6
-301-729 6
-301-731 . . . . . 3, 5, 6, 8
-301-732 . . . . . 3, 5
-301-733 . . . . . 3, 5, 6
-301-742 . . . . . 3, 6
-301-743 . . . . . 3, 6
-301-750 . . . . . 3, 6
-301-751 6
-301-760 6
-301-761 . . . . . 3, 6
-301-764 . . . . . 3, 5
-302-230 5
-302-231 5
-302-232 5
-302-233 5