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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

October 21, 2002

TO: Internal File

THRU:  Priscilla Burton, Soil Scientist – Team Lead

FROM: Gregg Galecki, Hydrologist 

RE: Skyline Mine North Lease Extension, Canyon Fuel Company, Skyline Mine, C007005 – SR02I

SUMMARY:

The proposed modifications to the Skyline Mine Reclamation Plan (MRP), addressing the North Lease Extension, was originally received by the Division on September 4, 2002. An Administrative Completeness Review was conducted which outlined additionally requested information. The Applicant submitted additional information on October 7, 2002, at which time the technical review commenced. The following technical analysis reviews the Geology and Hydrology sections of submitted amendment.

Information found in the amendment is currently not adequate to meet the requirements of the regulations. The Applicant should make the requisite modifications to the amendment prior to approval.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

TECHNICAL MEMO

Analysis:

The document contains errors of fact and omission. These errors should be corrected.

Findings

The information provided does not adequately address the minimum requirements of the Environmental Resource Information – Geologic Resource Information section of the regulations. Prior to final approval, the applicant must supply the following information in accordance with:

R645-300-133.100, (1) Section 2.3 of the MRP (pg. 2-22) references Figure 2.12A, which could not be located in the MRP; please clarify location of figure (2) Section 2.3.2 (pg 2-27) indicates the Burnout Creek study area is an ongoing study. This needs to be updated since the study was apparently completed April 17, 1998. (3) Page 2-29(a) references Plate 7 of Appendix Volume A-1. This Plate is not available in the Division MRP and needs to be provided. (4) Section 2.5.2 – Hydrologic Impacts of Mining Activities in paragraph 2, page 2-48 clearly identify the volume and location of ‘Exhibit A’, and all other references. (5) Within the July 2002 Addendum to the PHC, Appendix A needs to include a table of contents.(6) Page PHC A-18 briefly refers to the age-dating analysis being conducted by the Mine Operator, but does not cite where the information is located. Please provide a reference for the detailed age-dating analysis study. (7) Section 2.3.7 – Groundwater Monitoring Program, page 2-34 indicates ‘water quality samples are collected from 17 selected springs’. This needs to be updated to include the North Lease springs. (8) The following errors exist in the tables: Table 2.3.7-1, Station S26-13 is mislabeled as S24-13; Tables 2.3.7-1 and 2.3.7-2 indicate wells 79-14-2B and 79-22-2-2 are being monitored when text indicates they are not functioning; Table 2.3.7-3 indicates 24 springs exist, however spring S26-13 is listed twice; Table 2.3.7-3 lists well W13-1 as a culinary well while the text indicates it is abandoned; and the culinary wells (Table 2.3.7.3) are apparently referenced, but are not on the map. Section 2.3.7, page 2-35 needs to be updated to reflect current UPDES permit. (9) On page 2-32 a discussion indicates wells W13-1 and W17-1 are on Plate 2.3.6-1 and the locations could not be found. Text indicates that well W13-1 has been abandoned. (10) Page 2-33 indicates Mancos Shale outcrops in Eccles Creek and is located on Plate 2.2.1-1, but the surface geology does not extend to that location.

ENVIRONMENTAL RESOURCE INFORMATION

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

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

The surface geology map (dwg. 2.2.1-1) has been updated to include the North Lease area however, a few additions need to be made to be consistent with the text and additionally requested information. Text indicates the Connelville fault extends through the Winter Quarters Mine but it is not indicated on the map. Also, the third paragraph on page 2-11 (Section 2.2) discusses measurements of rocks in the #2 and #3 mines; for clarity reference a map showing the locations of mines #2 and #3, or indicate which mine is south of the dike area.

Of the three monitoring wells proposed in the North Lease area, no analysis of the 'potentially acid- or toxic-forming strata down to and including the stratum immediately below the coal seam to be mined' has been provided. Drill logs for Wells 91-26-1 and 91-35-1 were provided that indicate the stratum in the vicinity of the coal was core-drilled. Analysis of the stratum above, below, and including the coal seam to be mined needs to be provided.

Findings

The information provided does not adequately address the minimum requirements of the Environmental Resource Information – Geologic Resource Information section of the regulations. Prior to final approval, the applicant must supply the following information in accordance with:

R645-301-121.200, for clarity reference a map showing the locations of mines #2 and #3, or indicate which mine is south of the dike area.

R645-301-623.100, Analysis (for acid- or toxic-forming components) of the stratum immediately above, below, and including the coal seam to be mined needs to be provided.

HYDROLOGIC RESOURCE INFORMATION

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

TECHNICAL MEMO

General

Generally, the Applicant has done a good job of providing the necessary information for approval of the proposed amendment. Due to the complexity of the hydrology involved many outside studies (contained in the appendices and addendum) were conducted. The Division is concerned that the relevance of the appendices will be lost over time, because pertinent information has not been integrated into the MRP, to give a clear message to the reader. Particularly in the Hydrologic Resource Information section of this review, many of the deficiencies cited are for the purpose of incorporating relevant information that is available in the appendices into the narrative of the MRP.

Analysis:

Sampling and Analysis

The sampling and analysis that has been provided on springs, streams, and wells for initial characterization of the hydrologic regime in the North Lease area is adequate to initiate development mining. Additional Spring, Summer, and Fall sampling and analysis will be required prior to longwall mining commencing in areas undermining perennial streams.

Baseline Information

In Section 2.3 of the MRP, the third paragraph (pg. 2-22) addressing specific yields and hydraulic conductivities needs to be modified (in a general sense) to include conditions encountered in the southern portion of the mine.

Section 2.3.1 (pg 2-23a) indicates the Upper Joes Valley fault zone exists in the southwestern portion of the area. This is inconsistent with information provided in Section 2.2 of the MRP. The same paragraph also indicates water that was encountered is fault/fracture related and originates from the Starpoint formation. Provide a brief discussion of wells JC-1 and JC-2 and the information provided by the production of those two wells.

Section 2.3.4 – Aquifer Characteristics indicates (first paragraph) the Valentine fault is in the permit area, this is inconsistent with information provided in Section 2.2. The first few paragraphs also need to be reworked to accurately reflect current conditions (generally). Also, the top of page 2-29(a) provides a discussion of water levels from 1982 through 1992, this discussion needs to be updated (generally) to include the last decade. The top of page 2-29(b) should indicate that the change in the potentiometric surface gradient will remain only as long as pumping/draining continues.

Baseline Cumulative Impact Area Information

Section 2.5.3 – Alternative Water Supply, provides a discussion of the water rights owned by the Applicant within the Mud Creek – Price River drainage system. However, no mention of water rights in the Huntington drainage is mentioned. A discussion of an alternative water supply for the Huntington drainage, and its associated water quality requirements needs to be included.

Modeling

In Section 2.5.2 – Hydrologic Impacts of Mining Activities, the Permittee should provide a brief discussion of the modeling that is being conducted and outline how the study is addressing the hydrologic impacts to the surrounding area. This information is available in the July 2002 PHC Addendum however, the information needs to be addressed in this section of the MRP.

Probable Hydrologic Consequences Determination

Section 2.5.2 – Hydrologic Impacts of Mining Activities, in paragraph 1 identify the July 2002 submittal as an integral part of the probable hydrologic consequence (PHC). Also, briefly identify the contents/significance of the appendices of the addendum.

Section 2.5.1 – Potentially Affected Water Rights, include a brief discussion on Electric Lake water and inter-basin water transfer.

Section 2.5.2 – Mining Impact on Water Quality, in paragraph 2, page 2-49 include a brief discussion of the following items as they relate to the waters identified: indicate theorized source of inflow; state whether it is fault-related; indicate why there is no impact; discuss the reason why the intercepted waters are not affecting the potential discharge area; and state anticipated future actions to address if high inflows continue.

Section 2.5.2, page 2-50 indicates the increased flow has had a ‘positive effect on the aquatic flow system’. Clarify and be more specific on how it has had a positive effect. Also, indicate a macro-invertebrate study has been conducted.

Within the July 2002 Addendum to the PHC, Appendix A needs to include a table of contents. Too much time is spent by the reader paging through the appendix looking for a specific well or spring. When discussing a specific graph from the appendix a reference page would help locate that graph (i.e. pg. PHC A-10 graphs labeled “Wells W79-35-1A” should refer to a page in appendices).

TECHNICAL MEMO

Pages PHC A-12 and PHC A-13 discuss and indicate the water being sourced by the Star Point Sandstone, with the unit being under potentiometric head and moving through faults and fractures. The current dewatering by the mine is an attempt to lower the potentiometric surface. Provide a discussion of whether any springs or monitoring wells exist upgradient, within the Star Point formation, that are being affected by the lowering of the potentiometric surface.

In conjunction with the increased in-mine flow, age-dating analysis of the encountered waters has been conducted by the applicant. This has proven to be a critical analysis in the characterization of the water. However, sampling has been infrequent, and has not been outlined as part of the surface and groundwater monitoring program. As continued high-volume flows are encountered, a regular frequency of age-dating analysis needs to be provided to determine whether mixing of various water sources is occurring.

Pages PHC A-13 and PHC A-14 discuss the basic geomorphology of Eccles and Mud Creek and affects of the increased mine discharge. The bank stability/vegetation study is referenced but not explained. Briefly discuss what is involved in the study and indicate that it has been recently modified and includes continued monitoring. A primary function of the study/monitoring is to assess whether the increased flow (44 times the normal daily flow) is having any long-term, adverse impacts to the streams.

Within the July 2002 Addendum to the PHC, Conclusion section, include a brief discussion of future plans if the high flows continue, and an additional statement addressing what information will be provided by the groundwater modeling in defining the source of the water.

Groundwater Monitoring Plan

Section 2.3.5.2 – Groundwater Rights, indicates only one spring has a file water right and a limited number of wells are located in the area. Indicate whether this includes the North Lease area, the location and owner of the sole spring, and identify whether the wells have filed water rights, their location and owners.

Section 2.3.6 – Groundwater Quality, discusses several well that were developed and completed in the Starpoint sandstone. Identify these wells and their location. Page 2-32 also provides a discussion of well W2-1 (98-2-1) which needs to be re-written to address current conditions. A general discussion of the age-dating analysis, and why it has been conducted needs to be provided as well.

Surface-Water Monitoring Plan

The applicant has adequately identified additional surface water monitoring sites to include the North Lease area. The applicant has indicated they will look into possibly moving CS-19 or adding an additional surface-monitoring site on Woods Canyon that is located closer to the proposed mine permit area.

Findings:

The information provided does not adequately address the minimum requirements of the Environmental Resource Information – Hydrologic Resource Information section of the regulations. Prior to final approval, the applicant must supply the following information in accordance with:

R645-301-724.100, In Section 2.3 of the MRP, the third paragraph (pg. 2-22) addressing specific yields and hydraulic conductivities needs to be modified (in a general sense) to include conditions encountered in the southern portion of the mine.

R645-301-724.100, Modify Section 2.3.1 and Section 2.3.4 to be consistent with geologic information provided in Section 2.2.

R645-301-724.100, Provide a brief discussion of wells JC-1 and JC-2 and the information provided by the production of those two wells.

R645-301-724.100, The first few paragraphs of Section 2.3.4 need to be reworked to accurately reflect current conditions (generally).

R645-301-724.310, Additional sampling and analysis will be required prior to longwall mining commencing in areas undermining perennial streams.

R645-301-726, In Section 2.5.2 – Hydrologic Impacts of Mining Activities, provide a brief discussion of the modeling that is being conducted and outline how the study is addressing the hydrologic impacts to the surrounding area.

R645-301-728.200, In Section 2.5.2 – Hydrologic Impacts of Mining Activities, paragraph 1, identify the July 2002 submittal as an integral part of the probable hydrologic consequence (PHC). Also, briefly identify the contents/significance of the appendices of the addendum.

R645-301-728.350, In Section 2.5.1 – Potentially Affected Water Rights, include a brief discussion on Electric Lake water and inter-basin water transfer.

TECHNICAL MEMO

R645-301-728.310, In, Section 2.5.2 – Mining Impact on Water Quality, paragraph 2, page 2-49 include a brief discussion of the following items as they relate to the waters identified: indicate theorized source of inflow; state whether it is fault-related; indicate why there is no impact; discuss the reason why the intercepted waters are not affecting the potential discharge area; and state anticipated future actions to address if high inflows continue.

R645-301-728.310, Section 2.5.2, page 2-50 indicates the increased flow has had a 'positive effect on the aquatic flow system'. Clarify and be more specific on how it has had a positive effect.

R645-301-728.334, Provide a discussion of whether any springs or monitoring wells exist upgradient, within the Star Point formation, that are being affected by the lowering of the potentiometric surface.

R645-301-728.334, As continued high-volume flows are encountered, a regular frequency of age-dating analysis needs to be provided to determine whether mixing of various water sources is occurring.

R645-301-728.333, Briefly discuss what is involved in the Eccles Creek/Mud Creek study and indicate that it has been recently modified and includes continued monitoring.

R645-301-728, Within the July 2002 Addendum to the PHC, Conclusion section, include a brief discussion of future plans if the high flows continue, and an additional statement addressing what information will be provided by the groundwater modeling in defining the source of the water.

R645-301-724.100, Section 2.3.5.2 – Groundwater Rights, indicates only one spring has a filed water right and a limited number of wells are located in the area. Indicate whether this includes the North Lease area, the location and owner of the sole spring, and identify whether the wells have filed water rights, their location and owners.

R645-301-724.100, 724.310, 724.320, Make the requisite modifications to Section 2.3.6 as cited above.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Analysis:

Coal Resource and Geologic Information Maps

Plate 2.2.1-1, Surface Geology has been updated to include the North Lease area. However, additional modifications are still needed. Page 2.27a cites significant changes occurring in the Main Fork of Eccles creek at the contact of the Starpoint sandstone and the O'Connor fault; this information needs to be referenced and provided on map 2.2.1-1. Text indicates the Connelville fault extends through the Winter Quarters Mine but it is not indicated on the map. Surface geology mapping needs to be extended. Particularly to the east and south of the permit area to extend to the nearest mapped Starpoint formation. The map also needs to show the O'Connor fault. Requested additional geologic coverage will extend from the Fish Creek graben in the north to Electric Lake dam in the south, and from the Pleasant Valley fault in the east to the Gooseberry fault in the west.

Mine Workings Maps

The Mine Workings Map has been updated to included proposed monitoring in the North Lease area. Modifications to the mining methods have been taken into account in areas surrounding perennial streams.

Monitoring and Sampling Location Maps

Plate 2.3.6-1 has been updated to include proposed additional monitoring of surface and groundwater sites based on the addition of the North Lease area.

Subsurface Water Resource Maps

In Section 2.3.4, the water levels of the two monitoring wells in the North Lease area are discussed, but are not included in map 2.3.4-2 (potentiometric surface). This information needs to be provided (even if inferred contour lines) or discussed why it is not included.

Surface and Subsurface Ownership Maps

Plates 2.3.5.1-1 and 2.3.5.2-1 have been updated to include the North Lease area. No additional updates are necessary.

Surface Water Resource Maps

TECHNICAL MEMO

Plate 2.3.6-1 apparently identifies the sections of the streams that are perennial and intermittent (solid and dashed lines, respectively). However, due to the significant importance of identifying perennial reaches of the stream for maintaining aquatic life, the Applicant must to ground-truth the portions of Woods Canyon and Winter Quarters Canyon that are currently perennial in nature. Also, identify any beaver ponds impounding greater than ¼-acre-foot of water.

Findings:

The information provided does not adequately address the minimum requirements of the Environmental Resource Information – Maps, Plans, and Cross Sections of Resource Information section of the regulations. Prior to final approval, the applicant must supply the following information in accordance with:

R645-301-622, -722, Make the requisite changes to Plate 2.2.1-1 as cited above.

R645-301-722.100, Make the requisite changes to Plate 2.3.4-2 as cited above.

R645-301-731.221, On Plate 2.3.6-1 the Applicant must ground-truth the portions of Woods Canyon and Winter Quarters Canyon that are currently perennial in nature. Also, identify any beaver ponds impounding greater than ¼-acre-foot of water.

OPERATION PLAN

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Subsidence Control Plan

The mining of the North Lease includes undermining of perennial streams. As a portion of the Subsidence Monitoring Plan, identify stream-monitoring points on sections of perennial streams with less than 700-feet of overburden that will be flow monitored. These flow monitoring locations will be monitored beginning at least 6-months prior to the area being mined, and continued to be monitored for at least 6-months after the area has been mined. Frequency of monitoring will be on a monthly basis; weather permitting.

Findings:

The information provided does not adequately address the minimum requirements of the Operation Plan – Subsidence Control Plan Information section of the regulations. Prior to final approval, the applicant must supply the following information in accordance with:

R645-301-724.200, 724.310, 724.320, Include additions to the Subsidence Control Plan as cited above.

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

Groundwater Monitoring

Tables 2.3.7-1, 2.3.7-2, and 2.3.7-3 have been modified to include additional monitoring associated with the North Lease. However, the frequency of sampling is confusing. In the text, clearly state that groundwater monitoring is being conducted three times per year.

Surface Water Monitoring

Tables 2.3.7-1, 2.3.7-2, and 2.3.7-3 have been modified to include additional monitoring associated with the North Lease. However, the frequency of sampling is confusing. In the text (Section 2.4.4), clearly state that surface monitoring is being conducted three times per year.

When discussing stream monitoring in Eccles Creek and Mud Creek, include a discussion of the bank stability and vegetation monitoring being conducted due to the increased mine discharge into the creeks since August 2001.

Section 2.4.2 – Flow Characteristics, include a brief discussion of the increased flow being discharged into Eccles and Mud Creek, the fact that flow is currently 44-times the normal daily flow in Eccles Creek, and the apparent affects of the flow.

Update Section 2.4.3 – Sediment Yield, with a brief discussion of the affects of recent flows.

TECHNICAL MEMO

Section 2.4.4 – Monitoring Program, indicates water monitoring has been updated based solely on the 1996 Mayo and Associates PHC study. Include comments that other considerations have been included such as increased flow into Eccles Creek and Mud Creek (i.e. additional sampling in those creeks). Also, paragraph 3, page 2-44 needs to be modified to indicate the following: there is only one PHC (they may address different portions of the permit area): the 2002 submittal was in July not June; and the July 2002 submittal is an addendum to ‘the’ PHC and addresses different issues than the 1996 information.

Water-Quality Standards And Effluent Limitations

Based on increased discharge to Eccles and Mud Creeks the total volume of Total Dissolved Solids (TDS) and nickel has increased. The mitigation efforts that are briefly discussed on page PHC A-20 need to be provided and expanded in the appropriate section of the MRP (Section 2.5.2 – Water Quality).

Findings:

The information provided does not adequately address the minimum requirements of the Operation Plan – Hydrologic Information section of the regulations. Prior to final approval, the applicant must supply the following information in accordance with:

R645-301-731.211, 731.222, In the text, clearly state that both groundwater surface-water monitoring is being conducted three times per year.

R645-301-731.221, When discussing stream monitoring in Eccles Creek and Mud Creek, include a discussion of the bank stability and vegetation monitoring being conducted due to the increased mine discharge into the creeks since August 2001.

R645-301-731.221, 731.224, Section 2.4.2 – Flow Characteristics, include a brief discussion of the increased flow being discharged into Eccles and Mud Creek, the fact that flow is currently 44-times the normal daily flow in Eccles Creek, and the apparent affects of the flow.

R645-301-731.221, -731.224.1, Make the requisite changes to Sections 2.4.3, and 2.4.4 as cited above.

R645-301-731.222.2, The mitigation efforts that are briefly discussed on page PHC A-20 need to be provided and expanded in the appropriate section of the MRP (Section 2.5.2 – Water Quality).

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Monitoring and Sampling Location Maps

The submitted maps adequately address the area with the addition of the North Lease area, with the exception of items outlined in other areas of this technical analysis.

Findings:

The information provided adequately addresses the minimum requirements of the Operation Plan – Maps, Plans, and Cross Sections of Mining Operations section of the regulations.

TECHNICAL MEMO

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

In Section 2.4.4 of the MRP the Applicant commits to continued sampling 'throughout the post-mining period until the reclamation effort is determined successful by the regulatory authority'. This adequately covers the Hydrologic Reclamation Plan.

Findings:

The information provided adequately addresses the minimum requirements of the Reclamation Plan – Hydrologic Information section of the regulations.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

Additional information from the Applicant is necessary prior to the Division completing their assessment. The required information is requested throughout the above analysis.

Findings:

The information provided adequately addresses the minimum requirements of the Cumulative Hydrologic Impact Assessment section of the regulations.

RECOMMENDATIONS:

The proposed amendment should not be approved in its current form. The requisite deficiencies cited above need to be adequately addressed.

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