

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

May 25, 2005

TO: Internal File

THRU: Peter H. Hess, Environmental Scientist III/Engineering, Team Lead

FROM: David W. Darby, Environmental Scientist III/Hydrology

RE: Pace Canyon Fan Portal-Topsoil Pile Revision, Canyon Fuel Company, LLC., Dugout Mine, C/007/0039, Task ID #2248

SUMMARY:

Canyon Fuel Company, LLC, submitted an amendment to the Dugout Canyon Mine/Pace Canyon Fan Portal on May 16, 2005. The Permittee proposes to install a culvert in an undisturbed drainage on the Fan Portal site, and then expand the topsoil stockpile above the culverted channel. Additional work will entail modifying a disturbed drainage ditch (PCD-2) from the topsoil pile to the sedimentation trap. The Division received an initial submittal for the Pace Canyon Fan Portal amendment in January 2005. The amendment was approved on May 6, 2005. This memo analyzes the review of the hydrology section submitted on May 16, 2005. Additional information concerning the stream morphology was submitted on May 25, 2005. Information concerning culvert inlet design was submitted on May 27, 2005.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

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

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

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Analysis:

The amendment contains information and engineered designs to reconstruct two hydrologic structures, a culvert in the south ephemeral channel of the fan portal in Pace Canyon and a disturbed drainage ditch (PCD-2) (Plate 5-2). The amendment also provides information, calculations and design criteria to transmit undisturbed runoff through the culvert. It also provides the designs, topography and calculations store topsoil from the site above the culverted channel. A berm is designed to contain and transmit rainfall and snowmelt along the bottom edge of the topsoil stockpile to a silt fence where runoff will be treated prior to flowing to a sediment trap. Maps have been certified by a registered professional engineer.

Findings:

Information provided by the Permittee meets the minimum requirements of the General resource information section.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Analysis:

The permit area and adjacent lands are shown on Plate 4-1 and Plate 7-1. The disturbed area for Pace Canyon Fan is shown on Plates PC5-2 and Plate PC5-5.

Findings:

The information in the MRP meets the minimum requirements of the regulations for the Permit Area section.

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

Sampling and Analysis

The Permittee has proposed to meet this requirement by supplying information and maps to show the location of the channel, culvert and topsoil stockpile.

There are no surface water sources in the area proposed to install the culvert or topsoil stockpile.

Ground-water information

The Permittee has provided maps showing there are no groundwater sources, springs, or wells in the proposed fan portal area that may be affected.

Baseline Cumulative Impact Area Information

The Pace Canyon fan portal lies within the permitted area and within the boundaries of the existing CIA.

Modeling

No numerical groundwater or surface water modeling was conducted for this site.

Probable Hydrologic Consequences Determination

A PHC determination prepared by Mayo and Associates in 1996 is in Appendix 7-2. The PHC determination for the MRP begins on page 741.

Adverse impacts to the hydrologic balance

The Permittee has committed to install various sediment control measures to prevent contributions of sediment to the stream. Mine water discharge has been identified as having the potential of transporting fine sediments downstream and possibly eroding the channel banks. The volume of mine water discharge is unknown at this time. Preventative measures are planned in the form of riprap to dissipate energy. The Permittee has committed to establish a geomorphologic monitoring plan downstream of the mine. Mitigation measures will be implemented if monitoring data show impacts have occurred.

Acid forming or toxic forming materials

There will be no impacts from acid or toxic forming materials.

Ground water and surface-water availability

There will be no impacts to groundwater from activities proposed in this amendment.

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Flooding or streamflow alteration

The Permittee assessed flooding and streamflow alteration for streams channels in the permit area, including the ephemeral channel for the expansion of the topsoil pile. Flow routing through sediment control structures will reduce peak flows from the disturbed area. Runoff from the disturbed area will flow through a catch basin or other sediment control device prior to discharge to Pace Creek. This will minimize or preclude flooding impacts to downstream areas.

The volume of streamflow will increase in Dugout Creek if water is discharged from the Mine to the creek. The permittee has committed to take precautions to avoid flooding of downstream areas. Potential impacts to the channel include displacement of fines on the channel bottom and minor widening of the channel. It is anticipated that the stream bank vegetative community will increase in density and vigor as a result of Mine-water discharges, and this vegetation will in turn minimize widening of the channel.

Sediment yield from the disturbed area

Silt fences and straw-bale dikes will be installed to control erosion as construction activities are implemented. The site will be seeded to establish vegetation to help stabilize the site.

Potential Hydrocarbon Contamination

There should be no hydrocarbon contamination from this amendment. A previously approved Spill Prevention Control and Countermeasure Plan (SPCC) has been modified to reflect the addition of an 8,000 gallon diesel fuel storage tank for the Pace Canyon fan portal installation. This plan is not required to be submitted as part of the MRP; however, a copy will be maintained at the Mine site as required by the Utah Division of Water Quality (p. 7-50). Construction of the facility will proceed under a construction SPCC.

Surface-Water Monitoring Plan

The Permittee has monitored hydrologic sites in Pace Canyon for baseline conditions. The data has been entered into the Utah Coal Water Monitoring Database. Surface water quality and quantity information is considered sufficient to characterize baseline conditions for the fan portal area.

Findings:

The information provided by the Permittee meets the minimum requirements of the Hydrologic Resource Information Sections of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

The Permittee has met the requirements of R645-301-521.141. Plate PC 5-5 clearly shows the boundaries of the proposed fan portal area, which is the area to be affected.

Mine Workings Maps

Plate PC5-2 shows the location of surface facilities, their elevations, and dimensions.

Monitoring and Sampling Location Maps

Elevations and locations of monitoring stations used to gather data on water quality and quantity are depicted on Plate 7-1.

Subsurface Water Resource Maps

The surface water resources adjacent to Pace Canyon are identified on Map 7-1.

Surface Water Resource Maps

Surface waters that will receive discharges from the fan portal affected areas are shown on Plate 7-1.

Well Maps

There are no gas, oil, or water wells within the proposed Pace Canyon fan portal area.

Contour Maps

Plate PC5-2 shows the existing topography and the proposed topography during mining. Plate PC 5-5 shows the topography after reclamation.

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Findings:

The information provided by the Permittee meets the minimum regulatory requirements.

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:

Ground-water monitoring

There are no ground water in the vicinity of the amendment site.

Surface Water Monitoring

There are no surface water monitoring sites on the amendment site.

Acid- and Toxic-Forming Materials and Underground Development Waste

Coal processing waste and mine development waste is disposed of in the Dugout Canyon Mine waste rock disposal facility. Waste rock will not be used during reclamation, and soil substitutes will be used only if their chemical and physical properties are determined to be adequate through appropriate analyses. As noted within the Technical Analysis, there will not be any waste rock disposal sites within the Pace Canyon fan portal facility.

Water-Quality Standards And Effluent Limitations

Discharges of water from disturbed areas will be in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining contained in 40 CFR Part 434 (p. 7-90).

Diversions: General

The design for the diversion structures are in Appendix 7-12.

The fan portal facilities will be constructed adjacent to Pace Creek. The main channel will not be obstructed or lined with a culvert. Three culverts, PCUC-1, PCUC-2, and PCUC-3, will direct undisturbed runoff around or under the fan portal pad. Culvert PCDC-1 will be used to direct decanted flows and overflows from the catch basin to the stream channel. Another culvert will direct Mine water (UPDES) flows to the creek. The Permittee has labeled the culverts on Plate PC7-5.

The Permittee has developed designs to install a culvert (PCUC-2) in the undisturbed channel (PCRD-1) and an undisturbed drainage ditch (PCD-2) to transmit treated runoff from the topsoil stock pile to the sediment trap. Culvert PCUC-2 will be a 24-inch CMP that extends below the topsoil stock pile, under the pad where it drops into channel PCRD-1, just above the main stream channel. PCRD-1 is designed for a peak flow of 19.05 cfs resulting from the 10 yr-24 hr precipitation event. Calculated peak discharge from watershed PCWS is 5.96 cfs. The Permittee has calculated a 21-inch culvert could handle the peak flow, however they committed to use a 24-inch CMP to add extra capacity. Velocity of the peak discharge is calculated at 9.15 ft/sec, which will require 12 inch (d-50) to prevent dislodging of riprap apron. A debris structure will be built above the inlet to prevent clogging of the culvert.

Runoff from the south topsoil stockpile will be collected by a berm that encompasses the pile. The south end of the berm will have a silt fence to filter the runoff before it flows into ditch PCD-2, then to the sedimentation trap. Ditch designs for PCD-2 are provided in Table 7-3. A peak flow of 0.06 cfs will be generated from the topsoil stockpile. The channel is designed to transport the flow from a 10 yr- 24 hr precipitation event on the topsoil stockpile.

Plate PC7-5 shows a berm that will run the length of the disturbed area above the canyon road. It should prevent disturbed area runoff from running onto the road or leaving the disturbed area. A berm circles the topsoil pile and contains its runoff. Any flow from fan portal area will be collected by the berm, then directed to catch basin. The Permittee submitted designs and calculations for the berm on March 30, 2005. Design calculations have been provided for the berm in Appendix 7-12.

Stream Buffer Zones

Section 731.600 of the application indicates that mining activities will take place within the 100-foot buffer zone of Pace Creek. Plate PC5-5 depicts the buffer zone for Pace Creek. The buffer zone corresponds with the disturbed area boundary adjacent to the Creek. The

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boundary will be established and marked with stream buffer zone signs prior to the start of construction. The signs will be maintained until reclamation is complete.

Sediment Control Measures

Measures to control sediment include the main sedimentation trap, containment berms, silt fences, straw bales, and gravel/riprap protection. The runoff and sediment control plan has been designed to ensure that the operations within the disturbed area should not cause or contribute to degradation of water-quality outside the disturbed area. Riprap calculations have been submitted along with a cross-section for PCUD-2 showing a filter and graded riprap to a depth of 1 foot. Plates PC5-2, PC7-4, and PC7-5 show the locations where riprap will be placed.

Plate 5-2 shows the location of three water bars on the dirt road bisecting the fan portal site. The water bars will divert water off the road. There will be a minimum amount of traffic on the road. It is used occasionally by ranchers and some mine personnel accessing the upper elevations for degasification well work. The low traffic frequency will result in minimal disturbance and less erosion of the road surface. One water bar will be placed above the site and will divert undisturbed runoff coming down the road into Pace Creek. Two other water bars will be placed at about 200' intervals below the upper water bar. The runoff generated on the road could be diverted to the silt fences.

Siltation Structures: Exemptions

ASCA's are disturbed areas which cannot use retention time / settling as a means of sediment concentration reduction, (i.e., use of a pond or sediment trap is not possible). Other methods such as vegetation, silt fences or straw bales, berms, roughening, gravel or other accepted measures are used to control sediment pickup and transportation from small areas. ASCA's include outslopes of ditches and ponds, outcast slopes of roads and other small disturbed areas. The fan portal area has an outslope area below the road that does not drain to the catch basin. The permittee has committed to control runoff from this area with vegetation and silt fences / straw bales.

Discharge Structures

Culvert PCDC-1 will convey runoff from the sediment trap to Pace Creek. This culvert is the sediment trap spillway.

Hydrologic Balance Protection

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Information provided by the Permittee indicates no water will be consumed for this operation. Mine water discharge has been addressed in the MRP for the Dugout Mine.

The Permittee has addressed this section by submitting plans to route and control undisturbed and disturbed runoff over the fan portal site. The Permittee has provided calculations and maps to establish design flows for the fan portal site. Plate PC7-6 identifies the undisturbed watersheds (PCWS-1, PCWS-2, PCWS-3, and PCWS-4) where runoff will accumulate and flow through culverts (PCUC-1, PCUC-2, and PCUC3) shown on Plate PC7-5.

Findings:

Information provided by the Permittee meets the minimum requirements of the regulations.

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:

Affected Area Maps

The Permittee has supplied several maps that show the disturbed area boundary of the proposed fan portal site.

Mining Facilities Maps

Plate PC5-2 shows the location of the proposed surface facilities.

Monitoring and Sampling Location Maps

Elevations and locations of monitoring stations used to gather operational water quality and quantity data are on Plate 7-1.

Certification Requirements

Cross sections, maps, and plans have been prepared by, or under the direction of, a certified registered professional engineer.

Findings:

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The information submitted by the Permittee meets the minimum requirements of the regulations.

RECLAMATION PLAN

GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

During reclamation of the Pace Canyon fan portal site two drainages will be affected. The access road that traverses the disturbed area will cross both of these. The Permittee will place culverts in the road during mining operations, but remove them at reclamation, since they are considered a temporary structure. The channels will be reconstructed so that a swale will provide access and direct flow through the channel. Designs and cross-sections are shown in Appendix 7-12.

Findings:

The Permittee's submitted information meets the minimum regulatory requirements.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -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 fan portal area is relatively small at 2.7 acres. At mine closure, the fan portal area will be reclaimed back to approximate original contour. Channels will be recontoured and protected from erosion. Plate PC5-5 identifies the configuration of channel PCRD-1. Plate PC7-5A shows the different areas that will be stabilized via the following methods: gouging / reseeding, mulching, and riprapping. The Permittee has provided riprap calculations for the

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reclaimed channel PCRW5-2. Plates PC5-2, PC7-4, and PC7-5 show the locations where riprap will be placed.

The Permittee has committed to place plastic tape/ribbon atop native ground prior to placement of topsoil in the stockpile. The marker will allow operator to locate and reestablish the preexisting channel (PCRD-1). The top and bottom of the reconstructed channel will tie in with the natural undisturbed channel.

Findings:

The Permittee has supplied sufficient information to meet the minimum regulatory requirements of the regulations.

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:

Ground-water monitoring

No ground water monitoring sites exist on the fan portal area.

Since the Pace Canyon intake and exhaust portals are in the lower seam and there is an in-mine connection between the two seams, the reclamation of the portal and the shaft require a discussion of any water issues with the sealing and final reclamation. The BLM feels that this information is necessary to determine the need for a hydrostatically safe mine seal. The BLM has determined that this information can be submitted at a later time prior to sealing of the Mine. This submitted information will also be incorporated into the MRP.

Surface-water monitoring

Data will be collected from the sedimentation pond discharge point in accordance with the UPDES permit. Data will be collected under the surface water-monitoring program every year until bond release (p. 7-59). Locations of surface-water monitoring sites are on Plate 7-1.

Acid and toxic-forming materials

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There are several places within the MRP text that indicate that there are no acid- or toxic-forming materials within the Dugout Canyon Mine permit area. The text locations include Chapter 6, Geology, Chapter 5, Engineering, and Chapter 7, Hydrology. It appears this is not a problem at this site.

Transfer of wells

No wells exist within the fan portal area.

Discharges into an underground mine

No discharges of surface water will be made to an underground mine in the permit and adjacent areas (p. 7-60).

Gravity discharges

No gravity discharges will be made from an underground mine in the permit and adjacent areas (p. 7-60).

Water quality standards and effluent limitations

Discharges of water from disturbed areas will be in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining contained in 40 CFR Part 434 (p. 7-86).

Diversions

All corrugated metal culverts will be removed during reclamation when the Canyon is restored to its approximate original contour. Disturbed areas along stream channels will be rebuilt. The Permittee has been asked to evaluate the expected velocities where the stream channel has been disturbed to see if they should be riprapped. The required 100-year, 6-hour design event was used to size the channels.

The overall effect of the stream reclamation will be to provide a channel that is a significant improvement over that which was left by pre-SMCRA mining. The channel design will promote riparian revegetation. It should be noted that no fish have been found in Pace Creek.

Stream buffer zones

The stream buffer zone that was established by the Permittee prior to the development of the Pace Canyon site will be maintained to keep mining activities out of the stream. The permittee will maintain the stream buffer zone markers through Phase III bond release of this site.

Sediment control measures

The sediment control measures that will be utilized during reclamation will include silt fences and straw bales. These are considered adequate when properly installed and maintained.

Siltation structures

At reclamation the Permittee will remove the sediment trap and recontour the site. The Permittee plans to use straw bales, silt fences, mulching and surface roughening to treat / capture any sediment generated during the revegetation process.

Other treatment facilities

The Permittee will use gouging, mulch, and reseeding to establish vegetation. These will control erosion and minimize the contribution of sediment to the stream channel during and after reclamation.

Discharge structures

No discharge structures or impoundments will exist at the fan portal site after it has been reclaimed.

Casing and sealing of wells

There are no wells associated with the Pace Canyon fan portal.

Findings:

Information provided by the Permittee meets the minimum requirements of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

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

Analysis:

Affected Area Boundary Maps

The Permittee has supplied Plate PC7-5A, identifying the sediment control areas that will be utilized during reclamation. Plate PC5-5 depicts the reclamation topography and cross-section locations.

Reclamation Backfilling And Grading Maps

Plates 5-5 and Plate PC7-5A show the backfilling and grading plans.

Reclamation Facilities Maps

No facilities will be left at reclamation.

Final Surface Configuration Maps

Plates PC5-5 and Plate PC7-5A show the final surface configuration.

Certification Requirements

Cross sections, maps, and plans have been prepared by, or under the direction of, a registered professional engineer.

Findings:

Information provided by the Permittee meets the minimum requirements of the regulations.

**CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT
(CHIA)**

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

Analysis:

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The addition of the Fan Portal site and associated potential of stream channel influence from mine water discharge prompt changes in the current CHIA.

Findings:

The Division will update the CHIA to include the potential affects of surface disturbance and mine water discharge to Pace Creek when approval of the amendment has been completed.

RECOMMENDATIONS:

The hydrologic portion of the Fan Portal Amendment is recommended for approval.