

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

April 28, 2010

#3527
OK

TO: Internal File

THRU: James D. Smith, Permit Supervisor *JDS 17 May 2010*

FROM: Steve Christensen, Environmental Scientist *SSC*

RE: Add Zero Zero North Wedge Area, Consolidation Coal Company, Emery Deep, C/015/0015, Task ID #3527

SUMMARY:

On April 6th, 2010, the Division of Oil, Gas and Mining (the Division) received an application from Consolidation Coal Company (the Permittee) to revise the approved mining and reclamation plan (MRP) for the Emery Deep Mine. The application proposes to expand the previously approved Zero Zero North Federal Lease Boundary Adjustment (LBA) by 14 acres. The proposed expansion is located on the northeast boundary of Federal Lease UTU-86038. The Permittee owns the surface and coal within the 14-acre expansion (Zero Zero North Wedge).

The following memo examines the application relative to the hydrologic regulations of the State of Utah R-645 Coal Mining Rules.

Findings:

The hydrologic information meets the hydrology requirements as provided for in the State of Utah R645-Coal Mining Rules and should be approved at this time

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TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

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

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Analysis:

Alluvial Valley Floor Determination

The application meets the Alluvial Valley Floor Determination requirements as provided for in R645-302-320. Chapter XI, *Alluvial Valley Floors*, of the approved MRP contains information regarding alluvial valley floors (AVF's) within and adjacent to the permit area. Plate V-5, "Subsidence Monitoring Points and Buffer Zones" depicts the locations of the alluvial valley buffer zones established by the Permittee. The proposed expansion to the Zero Zero North Wedge is not located within an identified AVF.

Findings:

The application meets the Alluvial Valley Floor Determination requirements as provided for in R645-302-320.

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

Baseline Information

The application meets the requirements for Baseline Information as required by R645-301-724. Beginning on page VI-3 of the approved MRP, the Permittee provides baseline information for the ground and surface water resources located in within and adjacent to the proposed Zero Zero North Wedge.

During the permitting of the Zero Zero North Federal LBA (Task ID #3411), the Permittee submitted baseline information for the area that was compiled during the preparation of the Environmental Assessment (EA). The EA baseline information, *Selected Text from Miller Canyon Tract EA*, was submitted in Appendix VI-16.

The baseline information that was submitted discusses the Miller Canyon drainage that bisects the proposed Zero Zero North Wedge. Based upon site inspections by Division personnel and the information provided from the EA, it's been determined that the reach of Miller Canyon that flows through the Zero Zero North Wedge conveys irrigation return flow, runoff from snowmelt and precipitation events and discharge from a small spring (i.e. ephemeral in nature).

The volume of irrigation return flow within the Miller Canyon drainage is of sufficient volume and duration to support a small riparian corridor. On the 1st page of the baseline information in Appendix VI-16, the Permittee provides data obtained from the United States Geological Survey to establish water quality ranges for area drainages. The data clearly shows that the water quality degrades rapidly from the Emery Canal diversion upstream of the lease expansion (below 300 mg/L TDS) to Muddy Creek just below Miller Creek (as high as 3,715 mg/L).

The Permittee establishes that the primary source of flow to the Miller Canyon drainage is from irrigation return flow. During the preparation of the EA, the Bureau of Land Management (BLM) conducted numerous site visits. The information contained in Appendix VI-16 discuss how during a BLM site visit on April 24th, 2008 (prior to the start of seasonal irrigation practices), there was an absence of stream flow in Miller Canyon. The only flow documented at that time was from Christiansen Spring (SP-15 in the DOGM Water Quality Database) at a rate of less than 1 gallon per minute. Upon a return site visit, BLM representatives observed flows (following the instigation of seasonal irrigation practices) in excess of 100 gallons per minute.

Probable Hydrologic Consequences Determination

The application meets the requirements for Probable Hydrological Consequences (PHC) as required in R645-301-728. Beginning on page VI-16 of the application, the Permittee discusses the potential impacts from coal mining activities on the quality and quantity of surface and groundwater flow within and adjacent to the permit. The Permittee further provides detailed discussion as to how the potential impacts will be minimal and if necessary, can be mitigated. The approved PHC discussion includes the proposed Zero Zero North Wedge. The following potential impacts have been evaluated:

- Contamination from acid- or toxic-forming materials;
- Impacts to groundwater availability;

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- Impacts to surface water availability;
- Increased total dissolved solids concentrations in surface and groundwater;
- Flooding or streamflow alteration;
- Potential hydrocarbon contamination
- Coal spillage during hauling.

Recent ground water modeling (utilizing monitoring well data obtained from the mine site and surrounding vicinity) performed at the Emery Deep Mine provided the basis for determining the lateral extent of potential ground water impacts associated with mining activity at the site.

As part of the federal leasing process of lease UTU-86038, an Environmental Assessment (EA) was conducted on the 120-acre expansion tract of the Zero Zero North Panel (which includes the Zero Zero North Wedge). The EA was provided to the Division prior to the submission of the application.

Beginning on page VI-27b, the Permittee provides a thorough discussion of the hydrologic resources within the Zero Zero North panel (which includes the area of the Zero Zero North Wedge) and the potential for impacts. As no surface disturbance is planned in the expansion area, accelerated runoff and erosion will not occur. However, due to the full-extraction mining techniques to be utilized in the tract, subsidence could alter local drainage patterns by producing non-uniform settling and tension cracks. From previous permitting actions, the Permittee has provided a commitment to mitigate/repair any surface drainage impacts as a result of subsidence. In areas previously subsided, the tension cracks that formed at the surface have been observed to 'self heal' over short period of time. The surficial geology of the permit and adjacent area is predominantly Mancos shale. The clay components of this soil unit allow for fairly rapid filling of the tension cracks as they swell and expand in response to precipitation events.

As discussed in the MRP, the Ferron aquifer is intercepted by the mining activity at the Emery Deep Mine. As mining expands into the Zero Zero North expansion area, the groundwater in the Ferron Sandstone will continue to be intercepted. However, given the relatively small area of undermining associated with the expansion, it's unlikely that the quantity of intercepted water will change significantly.

Findings:

The application meets the Hydrologic Resource requirements of the State of Utah R645-Coal Mining Rules.

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:

The application meets the Maps, Plans and Cross Sections of Resource Information as required by the State of Utah R645-Coal Mining Rules.

With the addition of the Zero Zero North Wedge, the Permittee has revised all relevant plates/maps to depict the revised adjacent area. Hydrologic Plates VI-1, Plate VI-2, Plate VI-4, Plate VI-5, Plate VI-6, Plate VI-7, Plate VI-8, Plate VI-9, Plate VI-10 and Plate VI-12 have all been revised to depict the additional area of the Zero Zero North Wedge.

Findings:

The application meets the Maps, Plans and Cross Sections of Resource Information requirements of the State of Utah R645-Coal Mining Rules.

OPERATION PLAN

SUBSIDENCE CONTROL PLAN

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

Analysis:

Renewable Resources Survey

The application meets the requirements for Renewable Resources Survey as required in R645-301-724.

A pre-subsidence survey is located in Appendix V-5 with an associated Figure 1 that has been revised to depict the revised adjacent area that includes the Zero Zero North Wedge.

Subsidence Control Plan

The approved MRP meets the Operational Plan requirements for Subsidence Control Plan as provided in R645-301-525.120, -525.480

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Section V.B of the MRP discusses subsidence monitoring. Page 36 of the MRP outlines the steps and elements of the proposed subsidence-monitoring plan. The plan calls for the establishment of a series of reference points to be established outside the theoretical angle of draw. Item 1A on page 36 calls for a mine representative to inspect monthly the areas designated as "full extraction" on Plate V-5. The monthly inspections will continue until the survey monitoring points below indicate that there is no subsidence occurring. A record of the monthly inspections will be produced and forwarded to the Division. A copy of the inspection will also be kept at the mine office.

In addition, the Permittee has committed to establish pre-mining elevations and gradients of any irrigation ditches and pond embankments within the angle of draw (See Item 11 in chapter V page 37). The Permittee will also monitor these areas by visual inspection and post-subsidence ground survey to establish the effects of subsidence. The Permittee has committed to providing the Division with a quarterly subsidence mitigation report that describes the surface mitigation projects and their status broke down by surface landowner.

Subsidence mitigation efforts are further discussed on pages 39-42 of Chapter V of the approved MRP. Pages 41 and 42 of the approved MRP generally discuss timetables and how the Permittee will work with landowners and the Division regarding mitigation efforts. On page 39 of Chapter V of the approved MRP, the Permittee discusses the mitigation process relative to subsidence damage to structures and State appropriated water supplies. The Permittee commits to "restore, rehabilitate or remove and replace, to the extent technologically and economically feasible, each materially damaged structure, feature or value".

Page 41 in Chapter V of the MRP discusses subsidence mitigation. The Permittee states, "If subsidence occurs which prevents flow through a ditch that is used each summer, then it will be necessary to repair the ditch as soon as practical even though future subsidence may necessitate further work".

In addition, the mine has been designed to preclude subsidence in areas occupied by perennial streams. The Permittee has produced a plan to prevent subsidence from affecting Quitchupah Creek, Christiansen Wash and the alluvial valley floor area on the west side of the permit area by establishing buffer zones in these areas. Plate V-5, *Subsidence Monitoring Points and Buffer Zones*, depicts a stream buffer zone extending the full length of Christiansen Wash in the areas where full extraction mining will take place. Additionally, a buffer zone has been established in the alluvial valley floor area around Quitchupah Creek. The overburden depth and the angle of draw were used to determine the buffer zone dimensions. The buffer zone for Quitchupah Creek and Christiansen Wash includes an additional standoff distance of 100 ft. on either side.

The Permittee provides further clarification on subsidence mitigation on page 39 of the MRP. The Permittee commits to "mitigate the damage in accordance with R645-301-525.500"

and that “the mitigation process will be performed in accordance with R645-301-731.530, R645-301-525.520 and R645-301-525.530”. R645-301-731.530 calls for the prompt replacement of any state appropriated water supply that is contaminated, diminished or interrupted by underground coal mining and reclamation activities. R645-301-525.520 and R645-301-525.530 deal with the mitigation of any structures that are impacted by mining activity

The Permittee provides a commitment to “repair or replace any adversely affected State appropriated water supplies that are contaminated, diminished or interrupted” as required by R645-301-731.530 on page 41 of Chapter V of the MRP.

Per R645-301-731.530, the Permittee is required to promptly replace any State-appropriated water supply that is contaminated, diminished or interrupted by underground coal mining and reclamation activities. On page V-42 of the application, the Permittee outlines water replacement measures to be initiated in the event that mining activity was to impact the Emery Town Wells. If the town of Emery surface water system (Muddy Creek) becomes inoperable and the backup wells (Wells #1 and #2) have been impacted by mining activity, the Permittee provides a commitment to “hauling water to the Emery treatment facility until the towns surface system becomes operable, an alternative source is secured or the aquifer recharges”.

Findings:

The application meets the hydrologic requirements for Renewable Resources Survey as required by the R645-Coal Mining Rules.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Refuse Piles

The application meets the Refuse Pile requirements of the State of Utah R645-Coal Mining Rules.

The proposed expansion of the Zero Zero North Wedge does not call for additional surface disturbance. Refuse will not be stored at the site.

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Findings:

The submittal meets the Refuse Pile requirements of R645-301-746.212.

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 application meets the Operational Plan requirements for General Hydrologic information as provided in R645-301-731.

Chapter VI of the approved MRP discusses the hydrologic resources located within the Zero Zero North Wedge mining expansion area; including ground and surface water information, water uses, water rights as well as the probable hydrologic consequences of full extraction mining within that area.

The MRP outlines the measures to be taken during the operational mining phase to minimize disturbance of the hydrologic balance within and adjacent to the permit area as well as prevent material damage to the hydrologic balance.

Groundwater Monitoring

The approved MRP meets the Operational Plan requirements for Groundwater monitoring as provided in R645-301-731.210. The Permittee does not propose any additional ground water monitoring as a result of full extraction mining within the Zero Zero North Wedge. Christiansen Wash (SP-15) is located directly within the Miller Canyon drainage. SP-15 is already part of the operational groundwater-monitoring program for the Emery Deep Mine. No additional groundwater monitoring sites have been proposed, nor are they required with the proposed mining area expansion of the Zero Zero North Panel.

The Permittee provides comprehensive water monitoring information as to the specific ground and surface water sites and their respective monitoring protocols in Table VI-17, *Emery Mine Hydrologic Monitoring Program*.

Surface Water Monitoring

The MRP meets the Operational Plan requirements for Surface Water Monitoring as provided in R645-301-731.220. Additional surface water monitoring within the Zero Zero North Wedge is not necessary. As discussed in the baseline information section above, the Miller Canyon drainage is ephemeral and flows only in direct response to snowmelt/precipitation events and irrigation return flow. As a result, additional surface water monitoring points are not required with the expanded mining area of the Zero Zero North Wedge

Plate VI-4 of the application depicts the surface water monitoring points within the permit area as well as adjacent to it. Table VI-17, *Emery Mine Hydrologic Monitoring Program* provides the sampling protocols for all ground and surface water sites within the permit and adjacent area.

Water-Quality Standards And Effluent Limitations

The MRP meets the requirements for Water-Quality Standards and Effluent Limitations as outlined in R645-301-751. The Permittee operates under a UPDES discharge permit (#UT0022616) issued by the Utah Division of Water Quality (DWQ) and controls discharges from the mine to be consistent with that permit. The Emery Mine UPDES permit currently allows a maximum salt load of 12 tons/day to be discharged from the mine. If this load were discharged constantly throughout the year, the annual salt load from the mine to the Muddy Creek watershed would be 4,380 tons/year. Upon discussions with DWQ personnel, it's anticipated that the salt-load limit will change to approximately 3,839 tons/year. The addition of the Zero Zero North Wedge does not require additional UPDES effluent/discharge monitoring.

Diversions:

The application meets the requirements for Diversions as required in R645-301-732.300, 742.100, 742.200, 742.300, 742.320 and 742.330. No diversions are proposed/required with the expanded mining area of the Zero Zero North Wedge Area.

Stream Buffer Zones

The application meets the Stream Buffer Zone requirements as provided in R645-301-731.600. Page VI-27 discusses stream buffer zones. No perennial or intermittent streams are located within 100-feet of the proposed Zero Zero North Wedge Area. Plate V-5, *Subsidence Monitoring Points and Buffer Zones*, depicts the location of stream buffer zones established on both Christiansen Wash and Quitchupah Creek. All perennial and intermittent streams in the permit area are protected by 100-foot stream buffer zones on either side of these streams.

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Sediment Control Measures

The application meets the Sediment Control Measure requirements as provided in R645-301-732. As no surface disturbance is proposed with the additional mining area of the Zero Zero North Wedge Area, no additional sediment control measures are required.

Siltation Structures: Sedimentation Ponds

The application meets the Siltation Structures: Sediment Ponds requirements as provided in R645-301-732.200 and -742.220. As no surface disturbance is proposed with the additional mining area of the Zero Zero North Wedge Area, additional siltation structures (i.e. sedimentation ponds) are not required.

Discharge Structures

The application meets the Discharge Structures requirements as provided in R645-301-734, -744. As no surface disturbance is proposed with the additional mining area of the Zero Zero North Wedge, no discharge structures are necessary.

Ponds, Impoundments, Banks, Dams, and Embankments

The application meets the requirements for Ponds, Impoundments, Banks, Dams and Embankments as required by R645-301-536.800 and-744.100. As no surface disturbance is proposed with the additional mining area of the Zero Zero North Wedge, no additional ponds, impoundments, banks, damns or embankments are required.

Findings:

The application meets the requirements for Hydrologic Information as required by the R645-Coal Mining Rules.

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.

Findings:

The application meets the Maps, Plans and Cross Sections of Mining Operations requirement as provided in the State of Utah R645-Coal Mining Rules.

Plate IV-2, *UG Operations Plan* and Plate VI-6, *Historic and Planned Mining Sequence* has been revised to depict the additional mining area of the Zero Zero North Wedge.

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:

The application meets the General Requirements for Reclamation as provided in R645-301-760. No surface disturbance is proposed with the additional mining area of the Zero Zero North Wedge. As a result, reclamation requirements are not applicable to this application.

Findings:

The application meets the Reclamation requirements as provided in the R645-State of Utah Coal Mining Rules.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

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Reclamation

The application meets the Road Systems and Other Transportation Facilities requirements as provided in R645-301-732.

Additional roads are not proposed with the addition mining area of the Zero Zero North Wedge.

Findings:

The application meets the Road Systems and Other Transportation Facilities requirements as provided in R645-301-732.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

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

Analysis:

The application meets the Cumulative Hydrologic Impact Assessment requirements as provided in R645-301-730. The Permittee has provided sufficient information in order for the Division to prepare an updated Cumulative Hydrologic Impact Assessment (CHIA). The Zero Zero North Wedge lies within the existing CHIA area.

RECOMMENDATIONS:

The application should be approved at this time.