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DIVISION OF OIL, GAS AND MINING


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October 25, 2001

TO: Internal File

THRU: Priscilla W. Burton, Senior Reclamation Specialist/Soil & Team Lead 

FROM: Gregg A. Galecki, Senior Reclamation Specialist/Hydrologist 

RE: Surface Mining of Barrier Coal, Lodestar Energy, Inc., White Oak Mine, C/007/001-SR01A-2

SUMMARY:

On February 2, 2001, the Division received an application for a Significant Revision of the Mining and Reclamation Plan at the White Oak Complex to include Surface mining of barrier coal. Mining would occur in areas that are currently disturbed but also extend into areas that are not now disturbed but which are ~~in~~ within the disturbed area boundary. An Administrative Completeness Review (ACR) determined some deficiencies existed, but the proposed amendment was considered administratively complete on March 19, 2001, based on the applicants' commitment to provide the requested information.

The proposal was returned to Lodestar Energy, Inc. with deficiencies and requesting additional information on July 13, 2001. Lodestar Energy, Inc. submitted additional information on September 10, 2001. The September 10, 2001, submittal was reviewed and returned with deficiencies to Lodestar Energy, Inc. on September 19, 2001. Lodestar Energy, Inc. submitted additional information on September 19, 2001. The following technical review evaluates the application from a geologic and hydrologic prospective. The current application meets the requirements of the State regulations, with the exception of a few stipulations outlined below.

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TECHNICAL ANALYSIS:

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

The proposal contains no cited examples where the current MRP needs to be changed for accuracy and completeness based on the proposed Significant Revision.

Findings:

Information in the application adequately addresses the requirements of the Permit Application Format and Contents section of the regulations.

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:

As outlined in R645-301-622, the application includes cross sections, maps and plans showing the nature, depth, and thickness of coal seams to be mined, each stratum of the overburden, and the stratum immediately below the lowest coal seam to be mined.

Sections 624.200 through 624.320 have been revised to reflect surface mining activities. Appendix 6-1 (Summary of Results on Toxicity Tests for Barrier Coal Test Hole BCC-1) provides sufficient chemical analysis to determine all potentially acid- or toxic-forming, or alkalinity producing strata down to and including the stratum immediately below the coal seam to be mined.

Findings:

Information in the application is adequate to meet the requirements of the Geologic Resource Information section of the regulations.

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

Sampling and Analysis

A modification of the Sampling and Analysis is not necessary.

Baseline Information

The baseline currently available is sufficient for the proposed significant revision.

Ground-water Information

A modification of the Ground-water Information is not necessary.

Surface Water Information

No additional surface water information is necessary for the proposed significant revision since the majority of the activity is within the disturbed area boundary. Surface water sampling site VC-4, was moved due to the disturbance. This required adjustments to other sections of the MRP outlined below.

Alternative Water Source Information

The applicant anticipates that the proposed surface coal mining and reclamation activity will not result in contamination, diminution, or interruption of a surface water source.

Probable Hydrologic Consequences Determination

The applicant addressed the probable hydrologic consequences of the surface mining in the area and has determined there will be no detrimental impact to hydrologic regime. Minimal impact to water quality was supported through Appendix 6-1 (Summary of Results of Toxicity Tests) which determined the over-burden, inter-burden, and under-burden have a high net neutralizing potential, suggesting very little probability for acid or toxic mine drainage.

The applicant anticipates minimal long-term affects to the water quantity delivery. It is anticipated surface mining operation will disrupt the water flow through the area during the mining and reclamation of the site. The water flows will report to sedimentation ponds before

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reporting to Whisky Creek. The springs and seeps in the area of the surface disturbance will also be disrupted for a period of time during the operation and reclamation. This water is anticipated to potentially surface at a lower elevation or at the toe of the reclaimed slope before entering Whisky Creek.

Information in the application is adequate to meet the requirements of the Hydrologic Resource Information section 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:

The Belina Sediment Control Facilities map (R645-301-731.720d) provides accurate information concerning the spillway/discharge point from Pond D-1, and both the original and new location for Stream Sample VC-4

Monitoring Sampling Location Maps

Surface sample VC-4 will be eliminated or moved because it will be located within the proposed disturbed area, and no longer represent undisturbed flow within Whisky Creek. Sample site VC-4 was moved approximately 280-ft upstream which is not noticeable significant change on Map R645-301-722.100a (Ground and Surface Water Sampling Locations) due to the 1:24,000 scale. The change in site location for VC-4 is noted on Map R645-301-731.720d (Belina Sedimentation Control Facilities).

Findings:

Information in the application is adequate to meet the requirements of the Maps, Plans, and Cross Sections of Resource Information section of the regulations.

OPERATION PLAN

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Plans and drawings

The Spoils Backfill & Reclamation Details Sheet A illustrates current facilities and contours. The Spoils Backfill & Reclamation Details Sheet B illustrates the proposed contours, contours and remaining facilities upon the completion of the surface mining.

Findings:

Information in the application is adequate to meet the requirements of the Road System and Other Transportation Facilities section of the regulations.

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, -300-148, -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:

Surface-water monitoring

With the proposed alteration of Whisky Creek, Surface Sample VC-4 will no longer be a viable site since it will now be included in the disturbed area. The site will be moved approximately 280-ft upstream to accommodate moving of the undisturbed area boundary. The Belina Sediment Control Facilities map (R645-301-731.720d) has been altered to accurately illustrates both the original and future location of Surface Sample VC-4.

Acid and toxic-forming materials

With the use of data collected from the characterization of the overburden and underlying units the applicant has demonstrated that no acid and toxic-forming materials are likely to be encountered. Prior to placement of topsoil, the rough regarded slopes will be tested on a one sample per 5 acres density and 1 sample per drainage. If any of these samples return with parameters outside of acceptable range, the area around the unacceptable sample will be re-sampled at a higher density to determine the extent of the problem. The material left in the temporary spoil storage will be used to cover the problem area with at least 4-foot of additional non-toxic material.

Discharges

French drains are not being required installation at the Mine portals. The Division is allowing the potential for discharges into the mine workings based on the following criteria: Personnel safety is not an issue because the underground workings are abandoned; water quality

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and effluent limitations are negated based on the lack of toxic or acid-forming materials in the geology; and water quantity is mitigated by the commitment from the Operator to construct a French drain for any encountered flow from the headwall greater than 3 gpm. No significant/measurable flows from seeps or springs are anticipated.

Stream buffer zones

A complete alteration/disruption of the upper reaches of Whisky Creek will take place during the proposed Surface mining operation. Approximately 700-ft of Whisky Creek, previously undisturbed, will be rebuilt during the proposed revision. Flow encountered during surface mining will report directly into the pit and flow into Pond D-1 prior to being discharged into Whisky Creek. Detailed cross sections of Pond D-1 and maps of the drainage basin design were provided to demonstrate the proposed design handle the anticipated storm events. Portions of the stream proposed for alteration under the proposed plan incorporates 'the best technology currently available (BTCA)'. The BTCA recommends the use of bioengineering, drop structures, and natural stream channel design concepts which eliminates the use of riprap channels. The same channel design is suggested as an alternative to the currently accepted channel design.

Sediment control measures

Ditches diverting undisturbed drainage around the disturbed area do not exist in the area of the proposed surface mining. Undisturbed drainage is allowed to flow through the disturbed area and report to the Sedimentation Ponds prior to being discharged into Whisky Creek. Additional Pond storage has been designed to accommodate the additional flow.

Diversions

With the elimination of undisturbed area ditches diverting undisturbed drainage away from the disturbed area, ditches D-1001 through D-1004, and culverts C-1005 and C-1006 have been created or redesigned. Tables 742.310a, 742.310b and Appendix R645-301-742.310 (SEDCAD 4.0 calculations) adequately addresses the proposed changes. Undisturbed ditches that currently exist which will be eliminated as surface mining progresses were also addressed.

Sedimentation ponds.

Due to the elimination of undisturbed drainage ditches, the storage capacity of Pond 004A was re-evaluated and Pond D-1 was created. Table 742.221a reflects that these ponds were designed based on a 10-year, 24-hour storm event, compared with the previous pond designs based on a 25-year, 24-hour storm event. Figure 731.750h has been submitted which illustrates the Stage-Capacity Curves for Dugout Pond D-1.

Map R645-301-742-310B illustrates the acreages and weighted curve numbers used to create Tables 742.221b, and 742.221c. Appendix R645-301-742.310 (SEDCAD 4.0

calculations) contains the data used to demonstrate the ponds have the necessary capacity for the designed flow event. The assigned weighted curve number for Area 4, as illustrated in Map R645-301-742-310B has been re-adjusted to reflect the remaining Surface Facilities area. The permittee has committed to making a written adjustment to all Map R645-301-742-310B version submitted September 10, 2001. Tables 742.221c, 742.221d, and 742.221e have been recalculated using the same weighted curve number.

Findings:

Information in the application adequately addresses the requirements of the Hydrologic Information section of the regulations with the following stipulation:

The Permittee commits to making an adjustment to all Map R645-301-742-310B versions submitted on September 10, 2001, indicating a revised weighted curve number for Zone 4.

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.

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:

General

Reclaimed slopes are designed as a generally 2:1 slope. The Operator does not propose the use of cut-and-fill terraces in conjunction with the Reclamation Plan. However, as part of reclamation, benches and grade breaks will be incorporated into surface contouring for the purpose of enhancing vegetation and wildlife habitat.

Findings:

Information in the application is adequate to meet the requirements of the General Backfilling and Grading section of the regulations.

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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:

General

Within the current proposal a completely new Stream Alteration Plan has been submitted. The proposed Stream Restoration Plan incorporates 'BTCA' with the use of bioengineering, drop structures, and natural stream channel design concepts, and limits the use of riprap channels. The same channel design is suggested as an alternative to the currently accepted channel design.

The operator has committed a significant amount of time to characterize Whisky Creek as it currently exists in the area of the proposed surface mining. Generally, the current stream channel ranges in percent-grade from 9-27% with a majority of the stream averaging approximately 15% grade, and one 50-foot section at 37% grade. The proposed Stream Restoration Plan calls for slopes to range from 5-35% grade with a 175-foot section at 35% grade. Positive aspects of the plan include 175-foot and 150-foot sections at 5% and 14% grade, respectively, which promote riparian areas, and a 19% grade slope at the disturbed/undisturbed contact. The lessening of slope at the disturbed/undisturbed contact should minimize formation of a niche-point/erosional feature at the head of the re-built stream channel.

A major source of concern is the 175-foot, 35 percent-grade section (Section 2A). A slope that long and steep does not currently exist in the channel and was not sufficiently characterized. An ideal solution would be to extend the section over a longer distance and reduce the slope. Unfortunately, a loss of material due to mining of the coal does not make this feasible. On the proposed channel, Section 2A will be designed with drop structures and pools/basins spaced at 50-foot intervals. The main channel will be a main channel minimum width of 12 – 16 inches, and overbank zones of 8 – 10 feet wide and 10 – 15 feet long. Drop structures will use rock ranging from 6-12 inch diameter, and logs 4-8 inch diameter. SEDCAD 4 calculations have been included as an appendix to provide added support for the sizing of the rock used in the relocated stream channel design. The designed-storm used was a 100 year- 6 hour event. Although SEDCAD 4 uses a model-design for a rip-rap channel, the characteristics used for rock sizing were adequately adapted because the actual channel design will incorporate slope-breaks into the design. These slope-breaks will come in the form of the drop structures spaced at 50-foot intervals. The rip-rap channel design, using the PADER method of Steep-Slope design, indicated the following rock-sizing: Dmin of 3-inch, D50 of 6-inch, and Dmax of 9-inch. Rocks larger than 9-inches and woody debris will be used in the drop

structures. Any significant excess of fill material encountered will be used to reduce the slopes encountered in Section 2A.

The current stream has been characterized with an abundance of empirical data, and the proposed redesigned channel has been supported with SEDCAD 4 calculations and design illustrations consisting of ladder drops, 1-foot drops, and vortex weirs found in Appendix R2. In Figure SRP-2 the permittee has committed to making the following changes to the October 19, 2001 submittal: 1) the location of the highwall in the Relocated Stream Profile will be moved further upstream, 2) the graded spoils in the restored stream channel will be removed from the Transition X-Section to more accurately reflect the actual design.

Pages SRP-16 through SRP-17 describes in detail the construction and materials to be used in the reclamation of Whisky Creek. The cited pages provide the necessary detail for channel reconstruction using illustrations, photos, and modeling calculations (SEDCAD 4) from various appendixes within the MRP. The entire length of the restored channel will be lined with clay, armored with rock, and backfilled with native streambed material. Various drop structures, meanders, and overbank structures will also be incorporated throughout the channel based on the grade of the channel in the specific location. The types of features to be incorporated are based on empirical data collected from the original channel.

Findings:

Information in the application adequately addresses the requirements of the Reclamation Plan Hydrologic Information section of the regulations with the following stipulation:

- In Figure SRP-2 the permittee makes the following changes to the October 19, 2001, submittal: 1) the location of the highwall in the Relocated Stream Profile will be moved further upstream, and 2) the graded spoils in the restored stream channel will be removed from the Transition X-Section to more accurately reflect the actual design.

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

General

Per the State regulations concerning disposal of Excess Spoils and the installation of under-drains, the applicant has committed to install french drains for any seeps or springs encountered in the headwall in excess of 3 gpm. This is employed to ensure any significant water will flow away from the portals/headwall and drain towards the Whisky Creek drainage.

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Findings:

Information in the application is adequate to meet the requirements of the Contemporaneous Reclamation section of the regulations.

RECOMMENDATION:

The amendment can be accepted in its present form assuming the following stipulations are met:

- The Permittee commits to making an adjustment to all Map R645-301-742-310B versions submitted on September 10, 2001, indicating a revised weighted curve number for Zone 4.
- In Figure SRP-2 the Permittee makes the following changes to the October 19, 2001, submittal: 1) the location of the highwall in the Relocated Stream Profile will be moved further upstream, and 2) the graded spoils in the restored stream channel will be removed from the Transition X-Section to more accurately reflect the actual design.