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TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

October 27, 2008

TO: Internal File

THRU: Steve Christensen, Team Lead *SKC*

FROM: Priscilla W. Burton, CPSSc, Environmental Scientist III *PWB by SKS*

RE: Degassification Volume -- Add Well G-22 and access road, Canyon Fuel Company, Dugout Canyon Mine, C/007/0039, Task ID #3068

SUMMARY:

Attachment 2-1 of the **Methane Degassification Volume** of the MRP contains baseline survey information gathered from well sites. The G-22 well and access road were surveyed in November 2007. This site is located northeast of the Pace Canyon Fan Portal in Sec 18 of T13 S., R.13 E (Table 1.1, Figure 1-1, and Plate 1-4), on Thayn Trust lands (Plate 1-1). With this amendment, the total disturbed acreage for all degas wells is 49 acres. This figure includes the 14-acre AMV road and topsoil stockpiles along the road. The total disturbed area associated with the mine is 101.1 acres.

The Dugout Reclamation Agreement provides a bond for 79.3 acres. The MRP itemizes 97.6 disturbed acres, increasing to 101.1 acres with this application (Chap 1, pg 1-9 and in App. 1-4). The Division should request an updated reclamation agreement and change to the Exhibit A (disturbed area agreement) of the reclamation agreement.

Deficiencies identified with the application are listed below:

R645-301-114, In 2007, Federal Lease U-07064-027821 was increased by 40 acres to include the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Sec. 21 T. 13 S., R. 13 E. A BLM Lease modification document was not available for inclusion into the MRP, in September 2007 when the Division approved the amendment increasing the permit acreage, but the Permittee committed to update the right of entry information in Appendix 1-1 of the MRP when the modified BLM Lease U-07064-027821 was received (see **R645-301-114.100**). Prior to approval of this emergency action, this information must be included in the MRP.

R645-301-222, The soil survey lacks an adequate soil survey map for Site G-22 and other sites included in the survey. The site specific maps provided in Appendix C are not useful in determining the extent of soil map units. The enlarged sites maps

are distorted and not legible. The soils map must be provided on a scale no smaller than 1: 6,000 showing all appropriate USGS symbols (topographic lines, existing pads, roads, and individual soil pit locations, etc.). • Appendix C contains the laboratory reports. Laboratory reports have been retyped and do not include the name of the laboratory or the date of the analysis. Laboratory reports must be the original, to ensure that no typing errors of data occur and to verify the date of analysis and laboratory contact information. Please provide the original laboratory reports. Laboratory information for horizon B2 at site SP11 is missing and might be found on the original lab reports. • Appendix A of The soil survey does not provide adequate information from the Munsell Color chart to decode the dry color. [The moist color must also be given in Munsell notation.] All future soil surveys must include complete Munsell notation. This information would have been useful during this review, since the survey refers to contrasting soil color within horizons of SP10. The soil survey lacks an adequate soil survey map for Site G-22 and other sites included in the survey. The site specific maps provided in Appendix C are not useful in determining the extent of soil map units. The enlarged sites maps are distorted and not legible. The soils map must be provided on a scale no smaller than 1: 6,000 showing all appropriate USGS symbols (topographic lines, existing pads, roads, and individual soil pit locations, etc.).•It appears that field texture was not reported, since the profile descriptions listed on the soil profile sheets in Appendix A report the information collected by the laboratory for texture, including the notation "nd" for "not detected". Ordinarily texture is assessed in the field and reported on the field profile sheets and the original field sheets are provided in the survey. Original field sheets are requested with all future surveys. •Soil profiles SP 4 - 9 are not included in this emergency review. Site 21 is not included in this emergency review and information pertaining to the soil survey, especially the site map for Site 21 will not be not approved and should be removed from the application.

R645-301-121.100 and R645-301-230, The total topsoil removal volume is reported incorrectly for site G-22 on Table 2-1 and in Appendix 2-1, Attachment 2-2, Pad G-22 Summary. Only the access road volume has been reported in these two locations. The correct total volume for access road and pad is 2,103 cu yds as listed in the Topsoil Volume Calculations Table of Attach. 2-2 and as noted in the bonding calculations (App. 5-6). Please make the necessary corrections to Table 2-1 and Appendix 2-1, Attachment 2-2, Pad G-22 Summary.

R645-301-231.400, For site G-22 and access road, the topsoil stockpile dimensions are calculated in Attach 2-2 and reported in Table 2-2 as 85 ft. length X 65 ft. width X 25 ft high, with slopes of 1.25 h: 1v. A pile of this description would have the capacity for 5,115 cu yds, whereas only 2,103 cu yds will be salvaged. A more

realistic scenario would describe a pile with the same base, but a 12 ft. height. There is no need for 1.25h:1v slopes. The possible storage locations described in Section 231.100 as either pad G-17 or G-16, both are level pads. For the most effective erosion control protection through interim reclamation, the slopes should not exceed 2h:1v. The plan should be modified accordingly.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

RIGHT OF ENTRY

Regulatory Reference: 30 CFR 778.15; R645-301-114

Analysis:

Right of Entry to the surface lands is provided by federal coal lease U-07064-027821, dated January 1, 1957 (MRP Section 114 and Appendix 1-1).

In 2007, Federal Lease U-07064-027821 was increased by 40 acres to include the NW ¼ NW ¼ of Sec. 21 T. 13 S., R. 13 E. A BLM Lease modification document was not available for inclusion into the MRP, in September 2007 when the Division approved the amendment increasing the permit acreage, but the Permittee committed to update the right of entry information in Appendix 1-1 of the MRP when the modified BLM Lease U-07064-027821 was received (see **R645-301-114.100**). Prior to approval of this emergency action, this information must be included in the MRP. The MRP tabulates the lease acreage to be 2,456.14 acres.

The Surface Owner Agreement between the Thayn Trust and Canyon Fuel Company is included in Appendix 4-2 of the MRP. The agreement will expire in 2019. [09122007]

Findings

The information in the proposed amendment does not meet the requirements for approval. See deficiency written under Rf645-301-114.

ENVIRONMENTAL RESOURCE INFORMATION

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

PERMIT AREA

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

Analysis:

With this amendment, the total disturbed acreage for all degas wells is 49 acres. This figure includes the 15 acre AMV road and topsoil stockpiles along the road.

The total disturbed acreage for the mine is recorded as 101.1 acres. For the disturbed acreage listed for gas wells, roads, refuse pile etc, see Chapter 1 page 1-9 and Appendix 1-4. Appendix 1-4 provides a legal description of the disturbed area and disturbed acreage. This description was updated with this application.

Findings:

Information provided meets the reporting requirements.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

Appendix 2-2, Volume 1 of the MRP provides a general outlook on the soils of the Book Cliffs in the vicinity of the Dugout Mine. Figure 1-1 and Plate 1-4 (**Methane Degassification Amendment Volume**) shows the location of the degas wells. Table 1-1 provides locations of the wells and Table 1-2 states each well's acreage. With this amendment, the total disturbed acreage for all disturbance associated with the degas wells is 49 acres (MRP Chap 1, p. 1-9). [10272008]

The specific soils information for degasification well sites G-2 through G-19, and G-22 and G-31 is found in Attachment 2-1 (**Methane Degassification Amendment**) of the MRP. (Sites G-1 and G-8 were not developed.)

Baseline soil chemistry information for soils at sites G-2 through G-7 was collected at the time of disturbance (Attachment 2-1), all subsequent sites were surveyed and soil analyzed prior

to disturbance. The following parameters were analyzed: texture (particle size analysis), pH, Electrical Conductivity, Sodium Adsorption Ratio, percent CaCO₃, plant available Nitrogen, Potassium, and Phosphorus (Section 243). Soil sample analyses are found in Attachment 2-1.

The sites are located at approximately 7,400 to 8,900 ft (see Fig 1-1 and Plate 1.4). The site descriptions, drawings, and photographs are in Attachment 2-1. Some of the sites were previously disturbed by logging (Table 3-1, pg 3-16, Attachment 2-1 section 4.3), previous exploration or road construction (sites G-6, G-9, G-11, G-12, G-14, G-15, G-16, G-17, G-19).

Degas site G-22 is an undisturbed site at 8,050 ft. elevation. The site and access road is represented by soil pits SP-10, SP11 and SP-12 in Ryan Sweetwood's soil survey, November 2007. His credentials are attached to the survey. The survey indicates that the topsoil or A horizon is less than six inches. So that the A and B horizons will be salvaged together. (A ten inch salvage depth is anticipated.) Appendix A of The soil survey does not provide adequate information from the Munsell Color chart to decode the dry color. [The moist color must also be given in Munsell notation.] All future soil surveys must include complete Munsell notation. This information would have been useful during this review, since the survey refers to contrasting soil color within horizons of SP10.

It appears that field texture was not reported, since the profile descriptions listed on the soil profile sheets in Appendix A report the information collected by the laboratory for texture, including the notation "nd" for "not detected". Ordinarily texture is assessed in the field and reported on the field profile sheets and the original field sheets are provided in the survey. Original field sheets are requested with all future surveys.

Appendix C contains the laboratory reports. Laboratory reports have been retyped and do not include the name of the laboratory or the date of the analysis. Laboratory reports must be the original, to ensure that no typing errors of data occur and to verify the date of analysis and laboratory contact information. Please provide the original laboratory reports. Laboratory information for horizon B2 at site SP11 is missing and might be found on the original lab reports.

The soil survey lacks an adequate soil survey map for Site G-22 and other sites included in the survey. The site specific maps provided in Appendix C are not useful in determining the extent of soil map units. The enlarged sites maps are distorted and not legible. The soils map must be provided on a scale no smaller than 1: 6,000 showing all appropriate USGS symbols (topographic lines, existing pads, roads, and individual soil pit locations, etc.).

Site descriptions, sketches, profiles, and soil analyses are in Attachment 2-1 for the degas well sites. Soil profiles SP 4 - 9 are not included in this emergency review. Site 21 is not included in this emergency review and information pertaining to the soil survey, especially the site map for Site 21 will not be not approved and should be removed from the application.

Findings:

The information provided does not meet the requirements of the Regulations. See deficiency R645-301-222.

OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Topsoil Removal and Storage

Sites G-8 through G-19 and G-31, and G-22:
[10282008]

Site configurations are provided in Attachment 5-1. Disturbed acreage for each well site is tallied in Table 1-2, with an additional 14 acres disturbed for road construction noted below Table 1-2. Topsoil salvage areas vary from 0.32 acres at site G-6 to 4.7 acres at site G-18 (Table 1-2). Topsoil salvage from 1.6 acres along the access road and pad is reported for site G-22 (App. 2-1, Att. 2-2 September 25, 2008).

Topsoil removal volumes are listed in Table 2-1 and Section 222.400 and Attachment 2-2. The volume is reported incorrectly on Table 2-1 and in Attach 2-2 Pad G-22 summary for site G-22. Only the access road volume has been reported in these two locations. The correct volume for access road and pad is 2,103 cu yds as listed in the Topsoil Volume Calculations Table of Attach. 2-2. The correct volume was used in reclamation bonding, App. 5-6.

For site G-22 and access road, the topsoil stockpile dimensions are calculated in Attach 2-2 and reported in Table 2-2 as 85 ft. length X 65 ft. width X 25 ft high, with slopes of 1.25 h: 1v. A pile of this description would have the capacity for 5,115 cu yds, whereas only 2,103 cu yds will be salvaged. A more realistic scenario would describe a pile with the same base, but a 12 ft. height. There is no need for 1.25h:1v slopes. The possible storage locations described in Section 231.100 as either pad G-17 or G-16, both are level pads. For the most effective erosion

control protection through interim reclamation, the slopes should not exceed 2h:1v. The plan should be modified accordingly.

Erosion control methods for all stockpiles will include creation of stable slopes (ordinarily no steeper than 2h:1v), a berm around the base of the stockpile. This berm will be constructed of subsoil, but not excavated from around the topsoil stockpile. Surface gouging of the pile face and seeding with seed listed in Table 3-2 will be done to control erosion.

At some pad sites, stockpile slopes steeper than 2h:1v have been created temporarily. The steeper stockpile slopes allow for less disturbed area, but create difficult conditions for vegetation establishment. These steeper slopes are temporary and will be reduced during contemporaneous reclamation of the drilling pad sites. A projected date for contemporaneous reclamation of each sites is provided in the table in Attachment 5-2.

Subsoil will be excavated for use as berms and to create a mudpit at each site (Sec. 231.100, Methane Degassification Volume). But at the G-22 pad site, the depth to rock is 26 inches and the drilling mud will be transported via pipe to the existing mud pit at pad G-17, per Vicky Miller, 10/23/08.

Findings:

The information provided does not meet the requirements of the Regulations. See deficiency written under R645-301-121.100 and R645-301-230. Also, see deficiency written under R645-301-231.400.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240

Analysis:

This amendment makes no changes to the reclamation plan described for all the degas wells, as described below.

Degas Well Sites [07202007]

The reclamation timetable is shown on Figures 5-15 and 5-26. Unless otherwise specified, sites will be reclaimed in one phase after methane venting ceases. The well sites will be graded, topsoiled, roughened, seeded, and mulched (see Figures 5-4, 5-8, and 5-12). Topsoil

replacement depth for each site is listed in Table 2-3. Delays in well plugging will occur as described in Sec.242.100.

The plan describes the reclamation of the drilling mud pits in Section 242.100. The mud pit will be allowed to dry and will be filled with soil that will be compacted to minimize settling. There will be mixing of the cover material with the rock fragments and sediments of the mud pit to avoid creating an abrupt boundary between the layers.

The plan indicates the sites will be ripped to a depth of eighteen to twenty four inches (Section 242.100 and 341.200) to reduce compaction.

Topsoil will be re-spread using a trackhoe. The soils will be handled when loose and friable (not too wet, not too dry), see Section 242.100. Redistribution thickness is shown in Table 2-3.

Section 542.100, Attachment 2-4 and Figure 5-26 indicates the weeks to completion from the start of reclamation activities. Reclamation of the AMV road will not take place until final reclamation of sites G-18 and G-31. Road base will be retained in the fill during reclamation (Attachment 5-4).

Soil Nutrients and Amendments

Soil nutrients and amendments will be applied to the redistributed soils based on analyses of samples collected from the stockpiled topsoil as compared with baseline information.

Soil Stabilization

Soil may be replaced at grades of up to 1.5h: 1v (p. 5-70). The steepness of these slopes will be reduced at their base, providing a concave slope. Soil stabilization techniques also include ripping the subsoils (see p. 2-39), gouging all slopes 3H: 1V or greater after topsoil application (p. 2-40 and 5-76) and hydromulching the seeded surface (p. 2-41 and 3-44 and 3-50). Slopes which are 3h: 1v or steeper will be gouged using a trackhoe (p. 5-70).

Findings:

The information meets the requirements of the Regulations.

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RECOMMENDATIONS:

The application is not recommended for approval. Deficiencies identified with the application are listed in the summary of this memo.

The Dugout Reclamation Agreement provides a bond for 79.3 acres. The MRP itemizes 97.6 disturbed acres, increasing to 101.1 acres with this application (Chap 1, pg 1-9 and in App. 1-4). The Division should request an updated reclamation agreement and change to the Exhibit A (disturbed area agreement) of the reclamation agreement.

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