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DIVISION OF OIL, GAS AND MINING

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December 15, 1999

TO: File

THRU: Daron Haddock, Permit Supervisor

THRU: Steve Demczak, Project Lead *SD*

FROM: Priscilla Burton, Soils Reclamation Specialist *PB*

RE: Soils Technical Analysis of the Water Supply Well, Dugout Canyon Mine, Canyon Fuel Company, PRO/007/039-AM99G, Folder #2, Carbon County, Utah

**SUMMARY:**

The location of the water supply well is 450' south of the water tanks alongside the water tank access road (shown on Plate 7-5). On June 22, 1999, R. Davidson and Chris Hansen evaluated the proposed site. This submittal references the technical visit and subsequent soil sampling and testing. However, this submittal, does not contain Attachment A "Technical Field Visit Report" or Attachment B "Exhibit A of Appendix 2-8" or Attachment C "Soils Log for Test Pit TP-17" or Attachment D "TP-17 Soil Samples" Laboratory Data Sheets.

**TECHNICAL ANALYSIS:**

**ENVIRONMENTAL RESOURCE  
INFORMATION**

**SOILS RESOURCE INFORMATION**

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

**Analysis:**

### **Soil Survey Information**

Chris Hansen of EarthFax Engineering, Inc., gathered the soil resource information. A Qualification statement for performing the Dugout Canyon soil survey and a personal Resume are provided in Appendix 2-3, Soil Test Pit Logs.

### **Undisturbed Soils**

The concrete pad will cover undisturbed soil and rocky outcrop with non-existent soil. The well site will cover 2000 sq. ft. of undisturbed soil which 'lies in a stranded flood plain bench above the stream at the toe of a colluvium covered slope,' (see Drawing Ge 4 B001).

One soil pit was dug to a depth of five feet. The results of soil analysis for test pit 17 are shown in Table 2-1. However, this submittal does not contain Attachment A "Technical Field Visit Report" or Attachment B "Exhibit A of Appendix 2-8" or Attachment C "Soils Log for Test Pit TP-17" or Attachment D "TP-17 Soil Samples" Laboratory Data Sheets.

Test pit 17 (as described in Table 2-1) is a sandy loam soil with 19% coarse fragments in the surface 1.7 inches. The coarse fragments drop to less than 1% for the next 44 inches and then rise to 4.7%. A buried A horizon is found at 29.5 inches. The texture of the 29.5 to 31.0 inch buried A horizon is loam; it has the best water holding capacity and highest saturation percentage i.e. 9.3 AWH compared with less than 5 AWH and 43.6% compared with less than 33.2%. Below this narrow band of loam is sandy clay loam to a depth of 60 inches.

The Third Order Carbon Co. Survey (SCS, 1988) places the soil in the Rock Outcrop Rubbleland-Travessilla Complex. Mr Hansen identifies the soil after sampling as TS soil which is described on Plate 2-2 as 'native or surficially disturbed soil' and on page 2-5 of the MRP as 'loamy mixed Typic Haploboroll.' As described the TS soil appears to have approximately 30% gravel size rock fragments throughout the profile. Cobbles and sand increase in the C horizon (from 28 inches downward).

From what has been presented in the plan, the soil in test pit 17 is similar to the TS soil in that it has a neutral pH and low EC and SAR values. However, it has a much finer texture than the TS soil and does not possess the characteristic coarse fragments of the TS soil.

Perhaps the best description of the TS soil is found in the Dugout Mine TA:  
*The undisturbed soils were identified by the Order-I survey as part of the SCS listed soil unit Datino Variant complex, and were given the distinction "Soil Type TS." According to the SCS Carbon County soils survey, the Datino Variant soil complex is characterized as very deep, well drained, moderate permeable soils on mountain slopes being formed in colluvium derived dominantly from sandstone and shale. The SCS survey defines Datino Variant soils as loamy-*

*skeletal, mixed Typic Haploborolls. The typic subgroup of Haploborolls<sup>1</sup> is defined as freely drained soils with a moderately thick brownish mollic epipedon. Typic Haploborolls were formed in alluvium during the late-Pleistocene or Holocene ages, do not have a shallow lithic (stone) contact, and do not have deep wide cracks in most years. The USDA handbook further states that where slopes are suitable, Haploborolls are mostly under cultivation.*

*Undisturbed TS soils, as represented by soil test pits TP-1, 4, 5, 6, 7, 8, 9, 14, and 14A, are found on both sides of Dugout Creek in the northeastern portion and in the southwestern portion of the facilities area. The TS soils are found in flat lying areas and on slopes with grades up to 40 percent or more. The soil supports vegetation consisting of sage, cottonwood, gambel oak, grass, pinyon, and fir. Information condensed from soil test pit TP-4, TP-6 and lower sections of pit TP-1 show soil horizons O1 (1 inch), A1 (1 to 5 inches), B2 (5 to 14 inches), B3 (14 to 28 inches), and C (28 inches to 9 feet). Portions of TP-5 and TP-8 soil profiles appear to have been reworked by Dugout Creek; the upper four feet of TP-1 soil profile appear disturbed. Undisturbed Type TS soils have acceptable physical and chemical characteristic results consistent with requirements outlined by DOGM's soil and overburden guidelines as recorded in Table 2-1.*

*Other undisturbed soils located within the Disturbed Area Boundary and described by the SCS soils Order-III survey include Croydon loam, Comodore-Datino Variant complex, and Rock Outcrop-Rubbleland-Travessilla complex soils.*

Several questions remain unanswered by this submittal:

- What is the proximity of the proposed disturbance to the stream?
- Will the site be subject to flooding?
- What is the slope of the site?
- How will soils be stabilized during operations?

#### **Findings:**

The permittee must provide the following, prior to approval, in accordance with the requirements of:

**R645-301-222**, Complete Appendix 2.8 with all Attachments and Exhibits.

## **OPERATION PLAN**

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<sup>1</sup>Soil Conservation Service, U.S. Department of Agriculture, Agriculture Handbook No.436, pp 288-289.

## **TOPSOIL AND SUBSOIL**

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

### **Analysis:**

#### **Topsoil and Subsoil Removal**

Soil will be salvaged to a depth of eighteen inches. The O, A, B and C horizons will be combined. The buried horizons will not be salvaged.

The Dugout TA reports that 26,887 CY of salvaged soil will be used to reclaim 14.7 disturbed acres at the Dugout mine. This is an average of 13.6 inches over the entire site. The Dugout Mine would benefit from salvaging the topsoil from this site down to and including the buried A horizon, 31.5 inches deep. This buried horizon has the best texture, water holding capacity and the best saturation percentage of the entire profile. Salvaging this buried horizon would add 83 CY of topsoil to the storage pile to be used over the mine site.

#### **Topsoil Storage**

An estimated 111 CY will be salvaged and transported to the soil storage yard at the Soldier Canyon Mine.

### **Findings:**

The permittee must provide the following, prior to approval, in accordance with the requirements of:

**R645-301-232.500**, Salvage soil down to 32" to include the buried A horizon.

## **RECLAMATION PLAN**

### **TOPSOIL AND SUBSOIL**

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

### **Analysis:**

#### **Soil Redistribution**

Page 2-40 indicates that eighteen inches of topsoil will be returned to the well site at

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reclamation. On page 2-31, Appendix 7-8 is referred to as the location of volume calculations. However, App 7-8 is actually titled "Sediment Pond Design." This is probably a typographical error that should say App 2-8.

The report from the technical site visit dated 6/22/99 indicates that the area is riparian in nature. Upon reclamation, it should receive the considerations given to other riparian sites.

**Findings:**

The permittee must provide the following, prior to approval, in accordance with the requirements of:

**R645-301-121.200**, correct the typographical error on page 2-31 to indicate the correct location of volume calculations for the well site.

**R645-301-353.100**, include the well site in riparian restoration plans within the MRP.