CHAPTER 6
GEOLOGY

6.10 Introduction

This chapter presents a description of the geologic resources in the area of the Wellington Dry-Coal Cleaning Facility. Since no coal is being mined and no exploration activities are being conducted in the permit area, this chapter includes only general geologic information compiled from previously published documents.

6.1.1 General Requirements

The geologic resources in the Wellington Dry-Coal Cleaning Facility area are discussed in Sections 6.2.1 through 6.2.7 of this chapter.

6.1.2 Certification

All maps, plans, and cross-sections presented in this chapter, as required by the Utah Administrative Rules, have been certified by a professional engineer.

6.20 Environmental Description

This section presents a description of the geologic resources in the area of the Wellington Dry-Coal Cleaning Facility.
6.2.1 General Requirements

This section presents information concerning the regional and site-specific geology of the Wellington Dry-Coal Cleaning Facility area.

6.2.2 Cross Sections, Maps and Plans

Figure 6-1 presents a map and generalized stratigraphic section of the geology of the site area. Since there is no coal mining or exploration at the site, coal seam data such as outcrop lines, bedding plane orientations, and drillhole information are not shown.

No oil, gas, or water wells are known to exist within a quarter mile of the permit area.

6.2.3 Geologic Determinations

Since there is no mining at the site, no information has been provided concerning the acid or toxic forming characteristics of the site strata. The geologic information required by DOGM to make a determination as to whether the reclamation plan can be accomplished is presented in Section 6.2.4. Since no mining will occur at the site, no subsidence control program has been prepared.

6.2.4 Geologic Information

6.2.4.1 Regional Setting

The Wellington Dry-Coal Cleaning Facility is located in Castle Valley, about 3.5 miles west of the town of Wellington, Utah. Castle Valley is bordered on the north and east by the Book Cliffs, on the south by the San Rafael Swell, and on the west by the Wasatch Plateau. Castle
Valley is a broad plain dissected by several drainages. Elevations in Castle Valley range from about 5,300 feet in the drainage bottoms to about 6,300 feet near the foot of the Wasatch Plateau.

**Stratigraphy.** All rock units in the vicinity of the Wellington Dry-Coal Cleaning Facility are sedimentary (Figure 6-1). No igneous or metamorphic units are found in the area. The surficial strata in the area consist of the Mancos Shale, which was deposited during the Upper Cretaceous Age of the Mesozoic Era. The depositional history of this formation consisted of three marine transgressions (represented as shale in the rock record) separated by two major marine regressions (represented as sandstone deltaic deposits in the rock record – see Maxfield, 1976).

The Wellington Dry-Coal Cleaning Facility is constructed primarily on Quaternary slope wash and weathered material from the Blue Gate Shale Member of the Mancos Shale (Weiss et al., 1990). The Blue Gate Shale Member is underlain by the Ferron Sandstone Member at a depth of approximately 700 feet beneath the site, as indicated from a well log from a nearby gas production well (DOGM, 2007). A brief description of the geologic units that underlie the permit area is included below.

According to Weiss et al. (1990), Quaternary slope wash deposits in the area consist of light- to dark-gray, unconsolidated to weakly cemented, thin- to thick-bedded, and faintly cross-bedded detritus that form broad, gently sloping sheets. Clast sizes include clay, silt, sand, granules, and some pebbles. This unit ranges up to 25 feet thick.

The Blue Gate Member of the Mancos Shale consists of light bluish gray and gray thin- to medium-bedded shale and shaly siltstone with a few thin interlayered sandstone beds. This unit is relatively impermeable and contains a high gypsum content. It is up to 2,000 feet thick in the region, but is estimated to be approximately 700 feet thick beneath the permit area, as indicated above.
The Ferron Sandstone Member of the Mancos Shale consists of an upper and a lower sandstone unit separated by a middle unit of shale. It is estimated that the unit is approximately 55 feet thick beneath the permit area. The sandstones are typically light brown, thin- and even-bedded, cross-bedded, very fine grained to fine-grained sandstone and contain many large rounded concretions. The middle shale unit is light- to dark-gray, thin-to medium-bedded, even-bedded shale and shaly siltstone.

**Structure.** Stratigraphic units in the area dip 3 to 6 degrees to the northwest (Maxfield, 1976). There are no major faults in the vicinity of the permit area (Weiss et al., 1990).

**Geomorphology.** Castle Valley is described as a crescent-shaped series of interconnected lowlands along the northern and western border of the San Rafael Swell (Weiss et al., 1990). There is relatively little topographic relief in this lowland, but several erosional remnant pediment surfaces exist up to a few hundred feet above the surrounding topography. These pediment surfaces are capped by sandstone and limestone boulders and gravels derived from the Book Cliffs, and range up to dozens of feet in thickness.

**Surface and Groundwater Impact.** Surface and groundwater impacts are discussed in Chapter 7 of this document.

**Coal Geology.** No coal will be extracted by this operation. No coal-bearing units are known to exist at the site.

**6.2.4.2 Test Boring and Drillhole Data (overburden removed)**

No mining or coal exploration will occur in the permit area.
6.2.4.3 Test Boring and Drillhole Data (overburden not removed)

No mining or coal exploration will occur in the permit area.

6.2.5 Additional Geologic Information

It is not anticipated that any additional geologic data will need to be collected for this site.

6.2.6 Sampling Waivers

BRC Wellington does not request a sampling waiver for this site.

6.2.7 Description of the Overburden Thickness and Lithology

No mining or coal exploration will occur in the permit area.

6.30 Operation Plan

6.3.1 Casing and Sealing of Exploration Holes

No exploration holes will be drilled in the permit area.

6.3.2 Subsidence Monitoring

Since there will be no mining or exploration at this facility, subsidence will not occur as a result of facility operations. Therefore, a subsidence monitoring program is not required.
6.40 Performance Standards

6.4.1 Exploration and Drillholes

No coal exploration will occur in the permit area.

6.4.2 Monuments and Surface Markers of Subsidence Monitoring Points

Since there will be no mining or exploration at this facility, subsidence will not occur as a result of existing facility operations. Therefore, no subsidence monuments or surface markers are required.
REFERENCES


FIGURE 6-1. AREA GEOLOGIC MAP AND STRATIGRAPHIC SECTION

**LEGEND**

**Qsw**: Slope-wash deposits (Quaternary) – Light to dark-gray, unconsolidated to weakly cemented, thin- to thick-bedded faintly crossbedded detritus. Consists of clay, silt, sand, granules, and some pebbles. Forms broad, gently sloping sheets. Thicknesses range from a thin veneer to as much as 25 ft.

**QTpm**: Pediment mantle (Holocene to Miocene?) – Light-brown to brown, gray, or locally reddish brown, unconsolidated to well-cemented sediments of fluvial origin. Consists of a poorly bedded mixture of silt, sand, granules, pebbles, cobbles, and boulders. Chiefly siltstone and sandstone clasts. Unit ranges from about 10 ft to more than 150 ft thick.

**Qal**: Alluvium (Quaternary) – Dark brown to gray, thin to thick bedded, locally massive, crossbedded in places. Unconsolidated. Consists of clay, silt, sand, pebbles, and sparse cobbles of fluvial origin. Forms narrow to broad deposits. Thickness ranges widely, generally less than 50 ft.

**Kmbg**: Bluegate Member of Mancos Shale – Light-bluish-gray and gray, thin- to medium-bedded shale and shaly siltstone. Sparse interlayered thin sandstone beds. Up to 2,000 feet thick in some areas. Approx. 700 ft thick beneath the permit area.

Adapted from Geologic Map of the Price 30’X60’Quadrangle, Carbon, Duchesne, Uintah, Utah, and Wasatch Counties, Utah. By Malcolm P. Weiss et al., 1990. USGS Misc. Invest. Series Map I-1981. 1:100,000 scale

**INCORPORATED**

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**Div. of Oil, Gas & Mining**

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