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**Technical Analysis and Findings**  
**Utah Coal Regulatory Program**

June 12, 2015

**PID:** C0070039  
**TaskID:** 4892  
**Mine Name:** DUGOUT CANYON MINE  
**Title:** WASTE ROCK PILE EXPANSION

**Environmental Resource Information**

**General**

*Analysis:*

The application includes the expansion of the waste rock refuse site at the northeastern toe. The MRP remained unchanged in section 521.110 through 521.125 that details the total height of the refuse pile to sixty feet above portions of the immediate surrounding area, as shown on Plate 5-1. To include the additional area within this application Plate 5-1, 5-1A, 5-2 and, 5-2A were updated. The application meets the minimum requirements of R645-301-521.110-521.125

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**General**

*Analysis:*

This application is for an expansion of the Waste Rock Site to allow for more capacity of waste rock. All proposed changes are located in Chapters 2 (Soils), 5 (Engineering), 7 (Hydrology), and 8 (Bonding and Insurance). There are no proposed changes to the currently approved MRP in the sections of Biology (Ch.3), or Land Use and Air Quality (Ch. 4). Therefore, this application is compliant with Biology and Land Use because there are no proposed changes to the existing and previously approved MRP.

lreinhart

**Permit Area**

*Analysis:*

The application includes an updated RA Plate 5-1 which details the footprint of the disturbance area, operational contours, and existing ground contours. The MRP Section 521.140-521.169 remains unchanged detailing how refuse will be placed after foundation preparations. The application meets the minimum requirements of R645-301-521.140 through 521.169.

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**Maps Affected Area Boundary Maps**

*Analysis:*

The application includes an updated RA Plate 5-1 which details the affect area boundary. The application meets the

minimum requirements of R645-301-521.130.

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## Maps Existing Surface Configuration

*Analysis:*

Existing surface configurations are shown on updated RA Plate 5-1 with cross section shown on updated RA Plate 5-1A. The application meets the minimum requirements of R645-301-521.150

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## Maps Surface and Subsurface Manmade Features

*Analysis:*

The application meets the minimum requirements as there are no buildings within 1,000 feet of the permit area. The application meets the minimum requirements of R645-301-521.160.

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## Operation Plan

### Mining Operations and Facilities

*Analysis:*

There are no mining operations existing or proposed at the refuse pile site. The application meets the minimum requirements of R645-301-526.100.

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### Existing Structures

*Analysis:*

There are no buildings or proposed buildings at the refuse pile site. The application meets the minimum requirements of R645-301-526.110.

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### Subsidence Control Plan Slides and Other Damage

*Analysis:*

The MRP contains the minimum requirements that in the event of a slide that may have potential adverse effects on the public, proper, health, safety, or the environment, CFC will notify the Division following discovery of the slide and will comply with any remedial measure required by the Division. The application meets the minimum requirements of R645-301-515.

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### Topsoil and Subsoil

*Analysis:*

Analysis:  
Attachment 5-3 states that at the end of December 2014 there was 2,025,724 CF or 111,415 tons @110 lbs/CF remaining capacity in the permitted stockpile. Expansion of the waste rock pile will add an additional 0.73 acres to the refuse disposal area, which will expand the remaining capacity by an undisclosed volume. (The Division estimates from the cross sections that this expansion will provide capacity for an additional 45,000 CY.) The expansion will be on the northeast side of the pile adjacent to the access road. This expansion will into Map Units B and M shown on RA Plate 2-1, Soils Map. According to this map, these areas should provide 4 - 20 inches of salvageable soils from Map Unit M and 20 - 40 inches from Map Unit B. A comparison of RA Plate 2-1 and the proposed expansion shown on RA Plate 5-1 confirms that most of the new area is within Map Unit B. Assuming a recovery of 20 - 40 inches from the 0.73 acre area, there could be 1,955 CY to 3,921 CY recovered. This soil is subsoil quality as stated in RA Section 231.100, p. 2-7 and by Dan Larsen, the soil scientist who

conducted the soil survey found in Attachment RA 2-1.

Amended RA Table 2-2 outlines additional soils from areas B and M being salvaged with this expansion. The total volume of topsoil salvaged will be stockpiled in Topsoil Pile #3. The proposed location of topsoil #3 is shown on the Soil Stockpiles Map. The proposed pile will be rectangular in shape. The roughed in location allows for a stockpile that is approximately 60 ft wide x 160 ft long and 15 ft high, with slopes of 45%, approaching 2h:1v. The Division calculates a pile of this dimension will hold 5,333 CY. This volume is twice that expected. The Soil Stockpiles Map indicates the total volume of the pile will be 2,518 CY. Therefore the slope of the pile could be much less than the 45% shown on the drawing. Given that there is plenty of room for the 2,518 CY expected, a commitment to maintain slopes of the soil stockpile to 3h:1v is requested. That would provide better protection for the pile, by allowing the seeded vegetation an opportunity to take hold.

*Deficiencies Details:*

**Deficiencies:**

R645-301-121.200, In RA Table 2-2 topsoil salvage volumes the totals below each column are not summed correctly and should be checked for accuracy. In addition, figures provided in Row M of this table should be checked for accuracy.

R645-301-231.400 The Soil Stockpile map outlines a larger area than necessary to store the 2,518 CY. Therefore a commitment to maintain slopes of the topsoil stockpile to 3h:1v is requested as that will provide better protection for the pile, by allowing the seeded vegetation an opportunity to take hold.

R645-301-232.200, The salvaged soil should be stockpiled and labeled subsoil, as suggested by the quality of Map Units B and M soil described in RA Section 231.100, p. 2-7 and Attachment RA 2-1.

pburton

## Road Systems Classification

*Analysis:*

The application includes an update to RA Plate 5-1 which details the primary access road and temporary access road. Both roads are sloped at a uniform grade to flow into drainage ditches and then into the site's sediment pond. The application meets the minimum requirements of R645-301.527

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## Road System Plans and Drawings

*Analysis:*

The application includes an update to RA Plate 5-2 and Plate 5-2A that detail the reclamation contours of the refuse pile. The application meets the minimum requirements of R645-301-521, -527, and -537.

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## Road System Performance Standards

*Analysis:*

The MRP remains unchanged within this application, which details that all roads will have a uniform grade of 2% within the site and that drainage will flow into ditches and then into the sediment pond. The application meets the minimum requirements of R645-301-560.

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## Road System Certification

*Analysis:*

The primary road for the refuse pile remains unchanged within the application. No changes were made to the MRP sections 527. All roads will still be reclaimed at final reclamation, as detailed in update RA Plate 5-2. The application meets the minimum requirements of R645-301-521, -527, and -537.

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## Road System Other Transportation Facilities

*Analysis:*

The application did not change any of the primary roads and included an update to Chapter 7 to account for the additional runoff. The application meets the minimum requirements of R645-301-527.

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## **Spoil Waste Refuse Piles**

*Analysis:*

The application includes the expansion of the waste rock refuse site at the northeastern toe. The original MRP in section 645-301-536.100 stated the capacity of the waste rock site would be approximately 1,018,792 tons of refuse. The calculations to justify said volume are presented in RA attachment 5-3 which was last updated October 11, 2006. The current application does not meet the minimum requirements of R645-301-536.100 due no edits to the text with section 536.100 that details the new capacity added and total new overall capacity of the refuse pile site. This section should also describe the acreage disturbed by the refuse site with the new application considerations.

*Deficiencies Details:*

The current application does not meet the minimum requirements of R645-301-536 due no edits to the text with chapter 5 section 536:

R645-301-536.100 requires that details be added to include the new capacity added and total new overall capacity of the refuse pile site. This section should also describe the acreage disturbed by the refuse site with the new application considerations.

R645-301-536.120 requires that this section should also detail that the applications area is covered under sufficient foundation investigations, etc.

R645-301-536.200 requires this section to address how the area within the application will be placed in a controlled manner to ensure mass stability, etc.

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## **Hydrologic Diversion General**

*Analysis:*

The Permittee submitted an amendment to their waste rock facility plan to provide additional storage volume to their existing disposal site. The addition is on the north west corner of the existing pile. To facilitate the additional waste, disturbed drainage ditch DD-2 will be extended around the new toe of the waste pile in the north west corner. There are no design changes required for the disturbed drainage ditch due to the small size of the expansion. Plate 7-1 was updated to display the changes to ditch DD-2. The amendment meets the requirements of R645-301-742.

adaniels

## **Maps Affected Area**

*Analysis:*

The application includes an updated RA Plate 5-1 which details the affect area boundary. The application meets the minimum requirements of R645-301-521.130.

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## **Maps Certification Requirements**

*Analysis:*

The application included all drawings with PE stamps as required by R645-301-512. The application meets the minimum requirements of R645-301-513.

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# Reclamation Plan

## Backfill and Grading General

### Analysis:

The application does not change any text within the backfill section. The MRP details how the site will be backfilled with a total of four feet of cover meeting the minimum requirements of R645-301-553.

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## Topsoil and Subsoil

### Analysis:

#### Analysis:

The plan indicates in that when the refuse is constructed as described in Plate 5-1, the refuse pile surface will cover 12.59 acres. Factoring in the slopes, 14.2 acres will be covered with four feet of suitable soil. This will require 91,720 yd<sup>3</sup> of cover which will be comprised of a blend of refuse/subsoil, subsoil and topsoil (RA section 242.100 and Ra Attachment 2-2).

The total cover material available in storage is calculated in RA attachment 2.2. The total figure of 23,060 is based upon an increase of 2,518 CY in the topsoil stockpiled and the as built figures available for soil already stockpiled. However, the increase in salvaged soil should be logged as subsoil (see deficiency under Soil Operations Plan).

A borrow area will supply the remaining 57,195 CY. The Permittee will incorporate the first six inches of subsoil into the refuse, thereby amending the surface six inches of refuse for use as cover material. In this manner, the Permittee will require six inches less of imported material. This approach requires that the surface of the refuse is non-toxic and non-acidic. Consequently, the refuse has been sampled and analyzed on a regular schedule as described in RA Volume Section 536.200. The plan should specify in RA-Attachment 2-2 that refuse analysis will be monitored to assure that acid/toxic material is buried in the fill and only waste rock determined by analysis to be suitable will be mixed with substitute topsoil to provide cover. Should testing of the waste indicate that the final lift is acid/toxic forming, then four feet of suitable cover will be required.

The last record of waste sampling in the MRP Appendix 5-4 is dated December 2011. If there has been additional waste placed at the pile since that time, it must be sampled in accordance with the requirements of the MRP Section 536.200 of the RA volume. The plan indicates that for one grab sample will be taken for every ton (5,000 yd<sup>3</sup>) hauled to the waste rock site. The samples will be analyzed according to the Division's Topsoil and Overburden Guidelines

To be reclaimed as shown on Plate 5-2, the remainder of the site will receive a six inch topsoil layer (Sec. 242.100).

### Deficiencies Details:

R645-301-121.200, The total cover material available in storage is calculated in RA attachment 2.2. The total figure of 23,060 is based upon an increase of 2,518 CY in the topsoil stockpiled and the as built figures for soil already stockpiled. However, the increase in salvaged soil should be logged as subsoil (see deficiency under Soil Operations Plan).

R645-301-553.252, The plan should specify in RA-Attachment 2-2 that refuse analysis will be monitored to assure that acid/toxic material is buried in the fill and only waste rock determined by analysis to be suitable will be mixed with substitute topsoil to provide cover. Should testing of the waste indicate that the final lift is acid/toxic forming, then four feet of suitable cover will be required.

R645-301-553.252, The last record of waste sampling in the MRP Appendix 5-4 is dated December 2011. If there has been additional waste placed at the pile since that time, it must be sampled in accordance with the requirements of the MRP Section 536.200 of the RA volume.

pburton

## Road System Reclamation

### Analysis:

The MRP does not contemplate the retention of any of the refuse pile's roads. The application does not change any text

within Section R645-301-527 and meets the minimum requirements of R645-301-527 as all road will be reclaimed as shown on RA Plate 5-2.

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## Road System Retention

*Analysis:*

The MRP does not contemplate the retention of any of the refuse pile's roads. The application does not change any text within Section R645-301-527 and meets the minimum requirements of R645-301-527 as all road will be reclaimed as shown on RA Plate 5-2. The application meets the minimum requirements of R645-301-527

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## Hydrological Information Reclamation Plan

*Analysis:*

To facilitate this additional waste being placed at the waste facility, reclamation channel RD-2 will be extended around the new toe of the waste pile. Peak flow, maximum velocity, maximum depth and freeboard calculations were re-done to examine if the existing design of ditches RD-2, RD-3 and RD-4 were adequate. These calculations were updated in RA Attachment 7-4, Hydrology Calculations as well as RA Table 7-3, Diversion design summary. There are no changes required to cross-sections of the reclamation channels due to the small size of the expansion. The amendment meets the requirements of R645-301-742.

adaniels

## Contemporaneous Reclamation General

*Analysis:*

The application does not change any of the text within the grading section. The application meets the minimum requirements of R645-301-542.100 and -553.

cparker

## Stabilization of Surface Areas

*Analysis:*

Section 533 of the MRP details the slope stability and foundation considerations of the refuse pile and corresponding impoundments. The above stated section states that a minimum safety factor for the sedimentation pond embankments is 1.9 under static moist conditions. RA attachment 5-1 indicates that minimum safety factor of 2.2 will exist for the embankment under conditions of rapid down draw. Foundation design calculations can be seen in Chapter 2 and RA Attachment 5-1 of the MRP. The application meets the minimum requirements of R645-301-533

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## Cessation of Operations

*Analysis:*

The MRP includes the R645-301-515 requirements of detailed information provided to the Division as soon as practicable in the event of the cessation of operations. The application does not change anything within these section and meets the minimum requirements of R645-301-515.

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## Maps Affected Area Boundary

*Analysis:*

The application includes an updated RA Plate 5-1 which details the affect area boundary. The application meets the minimum requirements of R645-301-521.130.

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## Maps Bonded Area

### Analysis:

The application includes an updated RA Plate 5-2 and RA Plate 5-2A which details the bonded area. The application meets the minimum requirements of R645-301-800.

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## Maps Reclamation BackFilling and Grading

### Analysis:

The application includes an updated RA Plate 5-2 and RA Plate 5-2A which details the affect area boundary. The application meets the minimum requirements of R645-301-542.

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## Maps Reclamation Final Surface Configuration

### Analysis:

The application includes an updated RA Plate 5-2 and RA Plate 5-2A which details the final reclamation contours. The application meets the minimum requirements of R645-301-542.

cparker

## Maps Reclamation Certification Requirments

### Analysis:

The application included all drawings with PE stamps as required by R645-301-512. The application meets the minimum requirements of R645-301-513.

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## Bonding Form of Bond

### Analysis:

The Dugout Canyon Mine maintains a surety bond through Lexon Insurance Company as of 8/15/13 with a rider provided by Ironshore Indemnity. The application meets the minimum requirements of R645-301-800 in terms of a surety bond.

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## Bonding Determination of Amount

### Analysis:

The application includes update 2014 cost estimates utilizing Division approved cost estimating references such as R.S. Means and Caterpillar Performance Handbook. The bond amount escalated to 2019 is \$3,177,000, with the current bond amount sufficient by 10.5%. The application does not meet the minimum requirements of R645-301-830 as the grading volumes of the top and subsoil were not updated to reflect the increased size of the waste rock site.

### Deficiencies Details:

The grading bond sheet needs to be updated to reflect the increase in subsoil and top soil at reclamation. Volume of material needed to obtain 4 feet of cover = 91,720 Total Cover material available at refuse site=23,060 Vol of coal waste blended with subsoil= 11,465 Vol of subsoil and top soil to cover pile=80,255 Vol of cover material imported from borrow site=57,195

The revegetation bond sheet needs to be updated to reflect the increase in disturbance area requiring reseeding to 14.2 acres, as stated in the MRP section 2, page 2-16.

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## Bonding Terms and Conditions Liability Insurance

### *Analysis:*

Dugout Canyon Mine maintains liability insurance under National Union Fire Insurance Company, Pittsburgh PA vail from 02/01/15 to 02/15/2016. The insurance coverage includes the required march form, explosives and claims mad per occurrence. The application meets the minimum requirements of R645-301-830.500 for terms of maintaining liability insurance.

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