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

August 4, 2015

**PID:** C0070039  
**TaskID:** 4952  
**Mine Name:** DUGOUT CANYON MINE  
**Title:** WASTE ROCK EXPANSION

**Environmental Resource Information**

**General**

*Analysis:*

The application meets the minimum requirements of R645-301-521 due to information stated the mine plan details, plates, and drawings. 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 updated Plate 5-1. To include the additional area within this application Plate 5-1, 5-1A, 5-2 and, 5-2A were updated

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**Permit Area**

*Analysis:*

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

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**Maps Affected Area Boundary Maps**

*Analysis:*

The application meets the minimum requirements of R645-301-521.100 through-521.130 by updating all the relevant maps for the entire area shown on the mine plan as detailed on updated RA Plate 5-1 which details the affect area boundary.

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**Maps Existing Surface Configuration**

*Analysis:*

The application meets the minimum requirements of R645-301-521.150 as it includes a drawing or plate that clearly calls out the existing surface on updated RA Plate 5-1 with cross section shown on updated RA Plate5-1A.

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# Operation Plan

## Mining Operations and Facilities

*Analysis:*

The application meets the minimum requirements of R645-301-523, -526, and 528 as there are no mining operations existing or proposed at the refuse pile site

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## Existing Structures

*Analysis:*

The application meets the minimum requirements of R645-301-526 as there are no existing structures within the boundary area.

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## Subsidence Control Plan Subsidence

*Analysis:*

The minimum requirements of R645-301-525.400 are met in the application as the Permittee presented a clear subsidence plan for protected areas.

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## Subsidence Control Plan Slides and Other Damage

*Analysis:*

The application meets the minimum requirements of R645-301-515.100 with procedures already described within the existing MRP detailing the emergency contact procedures in the event of a slide.

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## Topsoil and Subsoil

*Analysis:*

**Analysis:**  
The information meets the requirements of the soils handling operation plan.

The engineer's 2014 Annual Assessment indicates that the remaining capacity of the waste pile is 75,026 CY. 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 42,000 CY, bringing the total capacity to 728,055 CY or 1,081,162 tons (density was estimated at 110 lbs/ft<sup>3</sup>, see calculations in RA Attachment 5-3).

The expansion will be on the northeast side of the pile adjacent to the access road. RA Table 2-2, Soil Salvage Volumes, estimates 2,518 CY of subsoil will be salvaged in equal measure from Map Units B and M. This estimate agrees with the RA Plate 2-1, Soils Map which shows that there are 4-20 inches of salvageable soils from Map Unit M and 20 - 40 inches from Map Unit B. However, the soil survey indicates that most of the salvageable soil will be 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.

An as-built survey of the total volume of soil salvaged and placed in subsoil pile #3 and the final configuration of subsoil pile #3 shown in cross sections and plane view on Dwg 2-2 and 2-2A must be provided promptly to the Division. At that time, RA Table 2-2\*\* should be evaluated for its utility and either revised or removed (along with all references to it) from the plan, in

accordance with R645-301-121.200.

The recovered subsoil will be stockpiled in Subsoil Pile #3, shown on the Storage Area Layout Operation Plan, Dwg. 5-1 and the Soil Stockpiles, Dwg. 2-2. The proposed pile will be rectangular in shape. The roughed in shape on the drawing 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 (2,815 CY), therefore the slope of the pile should be much less than the 45% shown on the drawing. This lesser slope is confirmed by the commitment in the MRP in Section 234.100, where the Permittee has stated that where space is available, the slopes of the soil stockpile will be maintained at 3h:1v (Section 234.100), allowing for better protection of the topsoil by vegetation.

\*\*RA Table 2-2 is referenced several times in the text of the Chapter 2 narrative. The information in this table is not accurate with regard to the total volume of subsoil and topsoil stockpiled at the site. The topsoil and subsoil stockpiles have been surveyed and their volume is known and provided in Section 242.100, p. 2-15 of the MRP. As built volumes of soil salvaged will be required for subsoil pile #3 constructed after this expansion. When reporting as-built volumes, RA Table 2-2 should also be revised, in accordance with R645-301-121.200.

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## Road Systems Classification

*Analysis:*

The application meets the minimum requirements of R645-301-527.100 by classify each road as primary or ancillary. 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.

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## Road System Plans and Drawings

*Analysis:*

The application meets the minimum requirements of R645-301-534.100 by submitting plans and drawing for each road to be maintained within the permit area. The application includes an update to RA Plate 5-2 and Plate 5-2A that detail the reclamation contours of the refuse pile.

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## Road System Performance Standards

*Analysis:*

The application meets the minimum requirements of R645-301-534.150 by submitting plans and drawing for each road to be maintained within the permit area to prevent and control erosion. 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 itches and then into the sediment pond.

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## Road System Certification

*Analysis:*

The application meets the minimum requirements of R645-301-521.170 by submitting plans and drawing for each road to be prepared by or under the direction of and certified by a qualified registered professional engineer. The primary road for the refuse pile remains unchanged within the application. No changes were made the MRP sections 527.

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## Road System Other Transportation Facilities

*Analysis:*

The application meets the minimum requirements of R645-301-521.170 by submitting plans and drawing for each road, conveyor, and rail system to be used within the proposed permit area. The application did not change any of the primary

roads and included an update to Chapter 7 to account for the additional runoff.

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## **Spoil Waste Refuse Piles**

*Analysis:*

The application meets the minimum standards of R645-301-528.322 due to updated volumes and areas in the MRP text. The application includes the text additions within Chapter 5 of the MRP detailing 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 addition of the 2015 Phase I expansion includes 0.74 acres boosting the capacity of the refuse pile an additional 62,370 tons to a total new capacity of the pile of 1,081,162 tons.

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## **Maps Affected Area**

*Analysis:*

The application meets the minimum requirements of R645-301-521.100 through-521.130 by updating all the relevant maps for the entire area shown on the mine plan as detailed on RA Plate 5-1.

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## **Maps Certification Requirements**

*Analysis:*

R645-301-512 minimum requirements are met as all mine drawings and plates are stamped by a Utah certified professional engineer with experience in underground mining operations.

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## **Reclamation Plan**

### **General Requirements**

*Analysis:*

The minimum requirements of R645-301-540 are met within the application as there is no change to the existing MRP reclamation details. 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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### **Backfill and Grading General**

*Analysis:*

The application meets the minimum standards of R645-301-553 due to updated volumes and areas in the MRP text. The application includes the text additions within Chapter 5 of the MRP detailing 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 addition of the 2015 Phase I expansion includes 0.74 acres boosting the capacity of the refuse pile an additional 62,370 tons to a total new capacity of the pile of 1,081,162 tons.

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### **Topsoil and Subsoil**

*Analysis:*

The information provided meets the requirements for reclamation topsoil and subsoil handling. The refuse will be reclaimed with four feet of the best available cover. Non refuse areas of the site will receive a six inch topsoil layer (Sec. 242.100 and Plate 5-2).

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 require four feet of suitable soil. This equates to 91,720 yd<sup>3</sup> of soil which will be comprised of a blend of refuse/imported borrow soil, 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 includes the projected subsoil salvaged with this expansion and the as built figures available for soil already stockpiled. The figure of 23,060 in storage is therefore a projection, not a certainty. 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 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.

RA-Attachment 2-2 specifies on page 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.

Records of waste sampling are provided in the MRP Appendix 5-4. The application provides the following additional analytical results for the refuse placed at the site in 2011 through 2015. (Each sample represents 5,000 cubic yards(CY) of waste.)

- Five additional samples taken in 2011, representing 25,000CY (analyzed December 14, 2011)
- Eighteen samples taken in 2012, representing 90,000 CY (The laboratory analysis dates were May 8, 2012, August 15, 2012, and September 28, 2012.)
- Two samples drawn in 2013, representing 10,000 CY (analyzed on June 19, 2013 and on November 25, 2013)
- Five samples drawn in 2014, representing 25,000 CY (all were labeled with the ID WR2014-01 by the mine, but given different Lab ID's and analyzed on October 2, 2014, November 7, 2014, November 25, 2014, and December 5, 2014.
- One sample taken in 2015 (analyzed March 5, 2015).

In general, the waste is sandy loam in texture. It has pH values ranging from 7.4 to 8.5. There is an occasional spike of selenium (May 8, 2012 analysis of sample WR2012-08). There is an occasional indication of acidity ((December 14, 2011 analysis of sample WR Oct 1 11). Overall it is low in vital plant nutrients, especially nitrogen and potassium. The 2014 samples had elevated SAR values which are unsuitable for blending with subsoil in the final surface four feet.

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## Road System Reclamation

### Analysis:

The minimum requirements of R645-301-534 are met within the application as there is no change to the existing MRP reclamation of roads throughout the permitted area. 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 minimum requirements of R645-301-534 and -552 are met within the application as there is no change to the existing MRP reclamation of roads that will be retained at the end of mining that exist throughout the permitted area. The MRP does not contemplate the retention of any of the refuse pile's roads.

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## Contemporaneous Reclamation General

### Analysis:

The minimum requirements of R645-301-553 of backfill and grading are met within the application as there is a detailed time table of reclamation activities within the MRP grading reclamation details.

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## Maps Affected Area Boundary

*Analysis:*

The minimum requirements of R645-301-542 are met within the application as an updated RA Plate 5-2 and RA Plate 5-2A were provided which details the affect area boundary.

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## Maps Bonded Area

*Analysis:*

The minimum requirements of R645-301-800 are meet within the application as the bonded area map was updated on RA Plate 5-2 and RA Plate 5-2A.

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## Maps Reclamation BackFilling and Grading

*Analysis:*

The minimum requirements of R645-301-542 are met within the application as updated plates were included in the application for the additional backfilling and grading areas or volumes.

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## Maps Reclamation Final Surface Configuration

*Analysis:*

The minimum requirements of R645-301-542 are met within the application as updated plates were included in the application for the additional final surface configuration back to AOC on RA Plate 5-2 and RA Plate 5-2A.

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## Maps Reclamation Certification Requirments

*Analysis:*

R645-3010-512 minimum requirements are met as all mine drawings and plates are stamped by a Utah certified professional engineer with experience in underground mining operations.

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## Bonding and Insurance General

*Analysis:*

The application meets the minimum requirements of R645-301-800 as the applicant is current on the bond and insurance standings. 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 Form of Bond

*Analysis:*

The application meets the minimum requirements of R645-301-860.100 as the applicant currently maintains a surety bond amount of \$3,550,000 which is held by Lexon Insurance Co with a rider held by Ironshore Indemnity Inc.

## **Bonding Determination of Amount**

*Analysis:*

The application meets the minimum requirements of R645-301-830.140 as the Permittee submitted detailed bond information in regards to the application. 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 \$293800 with the current bond amount sufficient by 17.24%.

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## **Bonding Terms and Conditions Liability Insurance**

*Analysis:*

The application meets the minimum requirements of R645-301-850 as 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.

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