



Technical Analysis and Findings
Utah Coal Regulatory Program

November 25, 2015

PID: C0150032
TaskID: 5011
Mine Name: CRANDALL CANYON MINE
Title: MIDTERM PERMIT REVIEW

General Contents

Identification of Interest

Analysis:

The current MRP does not meet the State of Utah R645 requirements for Identification of Interests.
The current Crandall Canyon mining and reclamation plan (MRP) provides the Legal, Financial and Compliance information on page 1-1 of Chapter 1. The information indicates that the applicant and operator is GENWAL Resources, Inc. Karin Odendahl is listed as the resident agent. Appendix 1-9 provides the Ownership and Control Information for Genwal Resources, Inc., Utah American Energy, Inc., West Ridge Resources, Inc. and Andalex Resources, Inc. as well as the numerous holdings by Murray Energy throughout the country.

Deficiencies Details:

R645-301-112: The current mining and reclamation plan (MRP) does not meet the State of Utah R645 requirements for Identification of Interests. The Permittee must revise the first page of Chapter 1. It identifies Intermountain Power Authority (IPA) as a joint owner of the Crandall Canyon Mine. As the first five pages are clearly out of date, the Permittee may choose to delete them as the information is located elsewhere in the current MRP.

schriste

Violation Information

Analysis:

The current Crandall Canyon MRP does not meet the State of Utah R645 requirements for Violation Information. Appendix 1-11 provides the violation information. The violation information was last updated to November 25th, 2009. Since that time the Division of Oil, Gas and Mining (the Division) has issued seven notices of violation (NOV). The Permittee must update this information.

Deficiencies Details:

R645-301-113.300: The current Crandall Canyon MRP does not meet the State of Utah R645 requirements for Violation

Information. The Permittee must revise/update the violation information in Appendix 1-11. It appears that the violation information in Appendix 1-11 was last updated in November of 2009.

schriste

Right of Entry

Analysis:

The current Crandall Canyon MRP does not meet the State of Utah R645 requirements for Right of Entry Information. The lease information provided in the Crandall Canyon Mining and Reclamation Plan needs to be revised to reflect the current leases held by the Permittee. Section 114, Right of Entry Information, beginning on page 1-5 as well as the first page (page 1) of Chapter 1 need to be revised.

Deficiencies Details:

R645-301-114: The current Crandall Canyon mining and reclamation plan (MRP) does not meet the State of Utah R645 requirements for Right of Entry Information. The Permittee must revise/update the lease information in the MRP. The lease information provided in the Crandall Canyon Mining and Reclamation Plan needs to be revised to reflect the current leases held by the Permittee. Section 114, Right of Entry Information, beginning on page 1-5 as well as the first page (page 1) of Chapter 1 need to be revised/updated. In addition, all maps, figures and plates that depict lease boundaries must be updated.

schriste

Legal Description

Analysis:

The current Crandall Canyon mining and reclamation plan does not meet the State of Utah R645 requirements for legal description. The Permittee must update the legal description beginning on page 1-7 of the MRP. The current legal description contains leases that have been relinquished by the Permittee.

Deficiencies Details:

R645-301-112.800, -114: The current Crandall Canyon mining and reclamation plan does not meet the State of Utah R645 requirements for legal description. The Permittee must update the legal description beginning on page 1-7 of the MRP. The current legal description contains leases that have been relinquished by the Permittee. As such, the Permittee must revise the legal description. The legal description, at a minimum, must include all disturbed (i.e. bonded) areas. If the Permittee chooses to, the legal description can also include those leases that are currently held by the Permittee. However, the State of Utah R645 rules only require that the legal description include areas for which the Division of Oil, Gas and Mining hold a reclamation bond (e.g. East Mountain, Burma Evaporation Basin and Crandall Canyon Mine facility). All plates and figures will also need to be revised to reflect the current permit area.

schriste

Operation Plan

Mining Operations and Facilities

Analysis:

The Division initiated a mid-term review of the Crandall Canyon mining and reclamation plan (Task ID #5011) on November 2, 2015 in accordance with R645-303-211. This Technical Memorandum presents the findings of the Midterm Permit review for the Crandall Canyon Mine related to engineering and bonding, including:

- A review of the current MRP portions of the permit to ensure that the mine plan contains the commitments for the current MRP of the best technology currently available (BTCA) to prevent additional contributions of suspended solids to stream flows outside of the permit area.
- Evaluate the reclamation bond to ensure that coverage adequately addresses permit changes approved subsequent to permit approval or renewal, and to ensure that the bond amount is appropriately escalated in current-year dollars.
- Evaluate the permit for compliance with variances or special permit conditions related to engineering and bonding.

The Permittee has not submitted a formally revised reclamation cost estimate and will do so by, December 13, 2015. The Division conducted a site inspection with the Permittee on November 2 2015. A review is conducted every five years between permit renewals to expedite the permit renewal process.

The last Midterm for the Crandall Canyon Mine was initiated on September 15, 2010 and completed on February 28, 2011 (Task #3614, #3722). Since the 2011 midterm the following task have been approved and resulted in changes in the bond required: #3616 Addition of Ditch DD-10A, #3997-4138-4163 Construction of the Burma Evaporation Pond, #4193-4209 Phase I bond release of the East Mountain Pad and road, DO-10A in regards to mine water discharge, #4311 reroute of mine discharge water, and #4385-4365 the addition of a fence and gate around the Burma pond. The 2011 Midterm bond required is \$2,294,000 while the Permittee maintains a current bond liability of \$2,327,000.

The current MRP does not meet the minimum requirements of R645-301-521 by failing to address changes in the mine boundary due to lease relinquishments. Plate 1-1 shows the lease of the existing permit area while plate 5-2 details the boundaries of all areas affected by mining operations. The Permittee has relinquished all lease claims associated with the South Crandall Canyon Mine and needs to update the appropriate drawings in Chapter 5 to reflect current lease areas.

The current MRP meets the minimum requirements of R645-301-523 by including a description of the mining operation, method of coal mining, engineering techniques, anticipated annual and total production of coal by tonnage, and major equipment to be used for all aspects of those operations proposed to be conducted during the life.

The current MRP meets the minimum requirements of R645-301-526 by detailing all support facilities associated with the mining operations. The location of the support facilities can be seen on Plates 5-3, 5-6, 5-7, 5-8, 5-18, 7-5, 7-5A, and 7-5C. Chapter 5 Section 5.23 details the various support facilities at the main mine facilities such as coal processing facilities, underground bath house, and water treatment facilities.

The current MRP meets the minimum requirements of R645-301-526 for the Mine water discharge Iron Treatment. The mine has discharged approximately 500 gallons per minute since 2009 that contains water with iron concentrations exceeding UPDES limits. The water treatment system is located in the "old loadout."

Deficiencies Details:

R645-301-521. The current MRP does not address changes in the mine boundary due to lease relinquishments. The Permittee needs to update the appropriate drawings in Chapter 5 to reflect current lease areas.

cparker

Existing Structures

Analysis:

The current MRP meets the minimum requirements of R645-301-526 by providing updated information to include the discussion previous and existing facilities and man-made features. Plates 5-1 and 5-2 within the MRP show the location and extent of past and present underground mining operations and facilities. Plates 5-3, 7-5, and 7-5A detail the location of surface and subsurface man-made features within, passing through or passing over the permit area.

cparker

Relocation or Use of Public Roads

Analysis:

The current MRP meets the minimum requirements of R645-301-521.133 due to information detailing measure to be used such as a general mining method that will be employed under or within 100 ft of public roads to protect interest of the public. The design and details for USFS road within the permit area is shown on Plate 5-19 sheet 5 through 9. Appendix 1-2 and 5-26 detail the USFS agreements with the associated USFS trail head at the edge of the mine facilities area and how the area will be reclaimed at final reclamation.

cparker

Coal Recovery

Analysis:

The current MRP meets the minimum requirements of R645-301-522 due to a discussion of the measures to be used to maximize the use and conservation of the coal resources. Chapter 5 Section 5.22 details annual tons recovered from the Crandall canyon Mine. The section also details where various sections of the lower Blackhawk formation of the Wasatch Plateau seams will be mined. The Hiawatha and Blind Canyon are not of mineable thickness in previous leases areas, such

as U-68082. Mining at the South Crandall lease area was in accordance with the approved Resources Recover and Protection Plan in appendix 5-24. All federal lease stipulations were addressed within Section 5.22, specifically stipulation #17 the Castle Valley special service district water treatment plant to service Mill Fork Graben and North of Little Bear spring.

cparker

Subsidence Control Plan Subsidence

Analysis:

The minimum requirements of R645-301-525.400 are met in the current MRP as the Permittee presented a clear subsidence plan for protected areas, however, subsidence monitoring requirements have been met as of 2014 and annual subsidence monitoring should be removed from the MRP. Section 5.25.14 of Chapter 5 of the MRP states the annual requirement of vertical and horizontal positions of all monitoring points and pins directly over and within the 20 degree angle of draw to the mined area surveyed by aerial photography for that specific year. The subsidence monitoring will be conducted annually until subsidence of less than one foot has been measure for three consecutive surveys showing that subsidence is substantially complete. Plate 5-5 and 5-5 (2) detail the coordinates for all subsidence monitoring locations, including monitoring points over areas where the lease has been relinquished The Permittee has submitted updated annual subsidence information since 2004 for the South Crandall mine and since 2012 for the East Mountain reclaimed slide area. As of the 2014 subsidence monitoring report, all monitoring points have not recorded any subsidence greater than six inches since 2012. The permittee should amend the MRP to include demonstration of subsidence is substantially complete and will no longer be monitored.

Deficiencies Details:

R645-301-525.400. The minimum requirements of R645-301-525.400 are met in the current MRP as the Permittee presented a clear subsidence plan for protected areas, however, subsidence monitoring requirements have been met as of 2014 and annual subsidence monitoring should be removed from the MRP. Section 5.25.14 of Chapter 5 of the MRP states the annual requirement of vertical and horizontal positions of all monitoring points and pins directly over and within the 20 degree angle of draw to the mined area surveyed by aerial photography for that specific year. The subsidence monitoring will be conducted annually until subsidence of less than one foot has been measure for three consecutive surveys showing that subsidence is substantially complete. Plate 5-5 and 5-5 (2) detail the coordinates for all subsidence monitoring locations, including monitoring points over areas where the lease has been relinquished The Permittee has submitted updated annual subsidence information since 2004 for the South Crandall mine and since 2012 for the East Mountain reclaimed slide area. As of the 2014 subsidence monitoring report, all monitoring points have not recorded any subsidence greater than six inches since 2012. The permittee should amend the MRP to include demonstration of subsidence is substantially complete and will no longer be monitored.

cparker

Subsidence Control Plan Slides and Other Damage

Analysis:

The current MRP meets the minimum requirements of R645-301-515.100 with procedures already described within the existing MRP Chapter 5 Section 5.15.10 detailing the emergency contact procedures in the event of a slide. Several areas are outlined within the MRP for site studies for 1:1 slope placement at final reclamation and the Division will be notified of any slope failures at said sites.

cparker

Fish and Wildlife Protection and Enhancement Plan

Analysis:

The current biology requirements are limited to conducting macroinvertebrate surveys each spring and fall on Crandall Creek due to iron laden discharge from the mine. From 2009 to 2013, the creek was sampled by JBR Environmental Consultants, Inc. and EIS conducted the surveys in 2014 and 2015. The 2009-2014 survey results generally show reduced habitat quality and less than optimal conditions. It does appear that the upper and the lower reach are increasing in quality standards or staying fairly stable. In the middle reach, the overall quality seems to be lower than the other two reaches; however, multiple metrics indicate that it is improving compared to early years sampled. Due to the impact on macroinvertebrate communities, the mine is required to complete an enhancement/mitigation project on the stream during final reclamation of the culvert. There are no concerns that require further action at this time.

Since mining is not occurring, raptor surveys are not required. Activity is limited to water treatment and impacts to wildlife are minimized and do not warrant further surveys. When reclamation activities begin, a raptor survey may resume.

Ireinhart

Fish and Wildlife Endangered and Threatened

Analysis:

The threatened and endangered species list in the MRP was compared to a more recent compilation. Although some species have been moved up or down in status, all current threatened or endangered species are addressed and are not impacted.

Ireinhart

Topsoil and Subsoil

Analysis:

Please provide updated information in accordance with R64-301-121.100. Operation and reclamation of the Burma pond is described in Chapter 7 Appendices D, Appendix 7-66 (electronic page 242). Although the Burma evaporation pond disturbed area is recorded as 7.32 acres, the Permittee anticipated soil salvage and redistribution from only 1.41 acres. Redistribution depth of the 1,137 cu yd topsoil will be six inches over the 1.41 acres as described in (Chap. 2). Chapter 2 of App. 7-66 states that after soil salvage at the Burma pond is completed, a final assessment of the volume will be updated in the MRP and a final report will be prepared and submitted to the Division. The work was completed in 2012. The as-built information could not be found within the MRP or in recent annual reports. Please provide the as-built report.

Reporting of depth of placement and sampling of dried sludge and routine compaction of the waste is described in (App. 7-66 Chap 5, item 2) and in the event of temporary cessation, covering of sludge with six inches of subsoil and an interim seeding of crested wheatgrass (App 7-66, Chap 5, Item 6).

Deficiencies Details:

Deficiency:

R645-301-121.100, Please provide the following current information:

1) Operation and reclamation of the Burma pond is described in Chapter 7 Appendices D, Appendix 7-66 (electronic page 242). Chapter 2 of App. 7-66 states that after soil salvage at the Burma pond is completed, a final assessment of the volume will be updated in the MRP and a final report will be prepared and submitted to the Division. The work was completed in 2012. The as-built information could not be found within the MRP or in recent annual reports. Please provide the as-built report.

2) Chapter 5 of App 7-66 item 2 states that the accumulated depth of sludge will be monitored and reported in the annual report and that grab samples of the dried material will be taken every five years or with 7.5 inches of solid waste deposited. This information could not be found in recent annual reports. Please provide the required reporting and analyses.

3) Provide a reporting of the depth of placement and compaction of sludge. Include sampling information if placement depth met the requirements of App 7-66, Chap 5, item 2.

pburton

Vegetation

Analysis:

During the emergency rescue attempt for the miners, a road and several drill holes were developed on East Mountain in hopes of establishing communication. The road and drill pads have since been reclaimed (pursuant to SITLA and USFS special use leases) but due to the emergency nature of construction there were no vegetation reference area established. In the summer of 2015, Mt. Nebo Scientific conducted vegetation surveys and identified reference areas. A report is currently being prepared and will be submitted to the Division for approval and incorporation into the MRP.

Ireinhart

Road Systems Classification

Analysis:

The current MRP meets the minimum requirements of R645-301-527.100 by classify each road as primary or ancillary. The design and details for USFS road within the permit area is shown on Plate 5-19 sheet 5 through 9. Each road and conveyor systems is show in Plates 5-3, 5-6, 5-10, 5-19, 7-5, 7-5A, 7-5C, and Appendix 1-2. Chapter 5 Section 5.27 details all transportation facilities in further detail, specifically USFS access roads for the existing USFS trailhead at the edge of the primary mining facilities. Appendix 5-26 contains specific details of arrangements between the Permittee GENWAL and USFS on said road.

cparker

Road System Plans and Drawings

Analysis:

The current MRP meets the minimum requirements of R645-301-534.100 by submitting plans and drawing for each road to be maintained within the permit area. Plate 5-10 shows the typical primary road design through the Crandall Main facilities area. Plate 7-5A details the location of culverts and appendix 7-11 for culvert designs.

cparker

Road System Performance Standards

Analysis:

The current MRP 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. Section 5.27 details all measures to be taken during the seasons the limit and control erosion along the primary access to the facilities.

cparker

Road System Certification

Analysis:

The current MRP 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 Jay Marshall.

cparker

Road System Other Transportation Facilities

Analysis:

The current MRP 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 as detailed in Plate 5-6 and various figures located at the end of Chapter 5.

cparker

Spoil Waste Disposals of Noncoal Mine Wastes

Analysis:

The current MRP meets the minimum standards or R645-301-528.330 due to no changes in the MRP text noncoal mine waste disposal located in the current MRP. Chapter 5 Section 5.28.30 details how noncoal waste generated will be brought outside the mine for proper disposal and that no oil or grease will be intentionally disposed of underground. All solid waste brought to the surface will be disposed of in a trash container and transported to a State approved landfill for final disposal.

cparker

Spoil Waste Coal Mine Waste

Analysis:

The current MRP meets the minimum standards or R645-301-528.320 due to no changes in the MRP text. Chapter 5

Section 5.28.30 details how underground development waste will be disposed of on pillar lines or stored in areas that have been mined where no second mining is to be done.

cparker

Spoil Waste Refuse Piles

Analysis:

The current MRP meets the minimum standards or R645-301-528.322 due to no changes in the MRP text. No process waste is generated at the Crandall Canyon Mine and in the event the waste encountered, and the volume of waste generated exceeds the capacity that can be disposed of along pillar lines, GENWAL commits to disposing of the waste in a DOGM approved disposal facility.

cparker

Spoil Waste Coal Processing Waste to Abandoned

Analysis:

The current MRP meets the minimum standards or R645-301-528.340 due to not changes in the MRP text. In no event will the disposal of waste in pillar lines interfere with future recovery of coal resources without consent of the BLM or managing agency of coal resources.

cparker

Hydrologic Ground Water Monitoring

Analysis:

During the midterm review, the water monitoring plan was reviewed to establish whether current requirements were sufficient to establish impacts to the hydrologic systems. During this review, it was noticed that the plan still requires motioning at 7 in mine wells (DH-1, MW-1, MW-2, MW-6, MW-6A, MW-7 and MW-8) located in the north leases that are no longer held by Genwall. These wells should be removed from the water monitoring plan.

Deficiencies Details:

R645-301-731.210 The Permittee must remove monitoring wells MW-1, MW-2, MW-6, MW-6A, MW-7, MW-8, and DH-1 from the water monitoring plan. These in-mine wells are located in a lease that no longer held by the Permittee.

adaniels

Hydrologic Impoundments

Analysis:

The MRP should be updated to meet the State of Utah R645 requirement for impoundments.

Appendix 7-66 of the approved MRP addresses the permitting, operations, and reclamation of the Burma Evaporation Basin. This basin is located about 10 miles down canyon from the mine site. This evaporation basin is where sludge clean-out material is deposited from the mine water treatment system. Appendix 7-66 describes the estimated operations of this pond, but at this point, since it has been in operation for a number of years, it should be updated to reflect the actual operations currently taking place.

During conversations with the mine during the midterm it was indicated that currently the water treatment system is being cleaned-out twice a week and 3-7 runs are made from the mine to the Burma pond each day it is being cleaned. This does not reflect what is described in the MRP.

It is also unclear how much solid material is accumulating in the pond. The plan indicates that they estimate that 1.5 inches of solid will accumulate in the pond each year (with hauling rates that are much lower than the actual hauling taking place). This does not reflect what is being described in the quarter impoundment inspections that are being submitted to the Division in each annual report. In 2013 and 2014 the sediment levels in the pond were reported as unchanged. The MRP should be updated to reflect actual accumulation rates, and the expected life of the pond if operations were to continue as they are currently taking place.

Deficiencies Details:

R645-301-731.121 Update Appendix 7-66 of the MRP to include the actual operations taking place at the Burma pond, specifically hauling of sludge/water from the water treatment system, instead of estimated operations.

R645-301-731.121 It is unclear how much solid material is accumulating at the Burma pond. The submitted quarterly impoundment inspections indicate that between 2013 and 2014, there was no change in the accumulated material levels. Appendix 7-66 estimates that 1.5 inches of material will be deposited each year (with hauling rates that are much lower than what is actually taking place). This accumulation rate, as well as the estimated life of the Burma pond should be updated to reflect what is currently taking place.

adaniels

Support Facilities and Utility Installations

Analysis:

The current MRP meets the minimum requirements of R645-301-521.180 and -526 require the description, plans, and drawing for each support facility to be constructed, used, or maintained within the permit area. The current MRP meets the minimum requirements of R645-301-526 by detailing all support facilities associated with the mining operations. The location of the support facilities can be seen on Plates 5-3, 5-6, 5-7, 5-8, 5-18, 7-5, 7-5A, and 7-5C.

cparker

Signs and Markers

Analysis:

The current MRP meets the minimum requirements of R645-301-521.200 by the general discussion of signs in Chapter 5 Section 5.21.20 through 5.21.27. At the time of the Division's inspection on November 2, 2015 all the appropriate signs were in place as described within the MRP.

cparker

Maps Affected Area

Analysis:

The current MRP does not meet the minimum requirements of R645-301-521.100 through-521.130 by not updating all the relevant maps for the entire area shown on the mine plan as detailed on Plate 5-2.

cparker

Maps Facilities

Analysis:

The current MRP meets the minimum requirements of R645-301-521.120 through-521.125 which require maps to clearly show existing surface and subsurface facilities. Plate 5-3 details the general overview of the mining facilities at the main portal site.

cparker

Maps Mine Workings

Analysis:

The current MRP meets the minimum requirements of R645-301-521.140 which requires maps that clearly show all mine plans. Plate 5-2 through 5-2H shows mining plans along with annual reports submitted to the Division.

cparker

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 Jay Marshall with experience in underground mining operations.

cparker

Reclamation Plan

General Requirements

Analysis:

R645-301-540 . The minimum requirements of R645-301-540 are not met within the current MRP as there is a missing reference to the operations and reclamation of the Burma Evaporation pond and Castle Valley special service district water treatment plant. Appendix 5-22A is the stand alone reclamation plan for the East Mountain Emergency Drillpads and Access Roads and is referenced in Chapter 5 Section 5.40 so that relevant information can be located. The MRP Chapter 5 Section 5.40 is missing information detailing that the operation and reclamation of the Burma Evaporation Pond and Castle Valley special service district water treatment plant to service the mine discharge can be found in Appendix 7-D, App. 7-65 and App.7-66. The Permittee will amend this section to include the relevant directions to additional reclamation plans associated with the Crandall Mining operations.

R645-301-540 . The minimum requirements of R645-301-540 are not met within the current MRP as the Burma Evaporation pond and Castle Valley special service district water treatment plant are not fully detailed in Appendix 7-66 and 7-65. The MRP within Chapter 7 Appendix 7-66 details several various operations and reclamation scenarios, as described in items one through seven on Page 8 of Appendix 7-66. Operations within the Burma Pond Appendix 7-66 need to be updated as detailed in hydrology deficiencies.

Deficiencies Details:

R645-301-540 . The minimum requirements of R645-301-540 are not met within the current MRP as there is a missing reference to the operations and reclamation of the Burma Evaporation pond and Castle Valley special service district water treatment plant. Appendix 5-22A is the stand alone reclamation plan for the East Mountain Emergency Drillpads and Access Roads and is referenced in Chapter 5 Section 5.40 so that relevant information can be located. The MRP Chapter 5 Section 5.40 is missing information detailing that the operation and reclamation of the Burma Evaporation Pond and Castle Valley special service district water treatment plant to service the mine discharge can be found in Appendix 7-D, App. 7-65 and App.7-66. The Permittee will amend this section to include the relevant directions to additional reclamation plans associated with the Crandall Mining operations.

R645-301-540. The minimum requirements of R645-301-540 are not met within the current MRP as the Burma Evaporation pond and Castle Valley special service district water treatment plant is reaching the end of its bonding agreement. The MRP within Chapter 7 Appendix 7-66 details several various operations and reclamation scenarios, as described in items one through seven on Page 8 of Appendix 7-66. Operations within the Burma Pond Appendix 7-66 need to be updated as detailed in hydrology deficiencies.

cparker

Approximate Original Contour Restoration

Analysis:

The current MRP meets the minimum R645-301-512.200 and -553.110 as there is no change in the MRP Chapter 5 Section 5.42.20 through 5.42.32 and all grading will be place back to approximate original contours. Plates 5-16, 5-17, and 5-17A detail the backfilling and grading procedure to eliminate the cut slopes and highwalls. Slope rounding on Plate 5-3 has been revised to meet the required slope of 1.5:1 at the specified reclaimed cross sections.

cparker

Backfill and Grading General

Analysis:

R645-301-553. The minimum requirements of R645-301-553 are not met within the current MRP due to outdated information present in the Appendix 7-65 and 7-66 backfilling cost. During reclamation the subsoils or backfill material will be laid in 12" to 18" lifts and compacted through repeated travel of heavy equipment. In areas with slopes of less than 30% the subsoil will be ripped to a depth of 18" prior to topsoil placement. In areas having an average slope of more than 30% the

subsoil will be ripped to a depth over 12". The East Mountain area has been fully back graded and remains stable as detailed in the 2014 Annual report. The Burma Pond and Castle Valley special service district water treatment plant final reclamation needs to be updated to reflect updated operations and life expectancy as addressed in hydrology deficiencies. The Water treatment area does not contemplate the volume required to backfill the current treatment pond shown on Plate 5-3 to achieve AOC shown on plate 5-17. Volumes of the loadout area need to be updated.

Deficiencies Details:

R645-301-553. The minimum requirements of R645-301-553 are not met within the current MRP due to outdated information present in the Appendix 7-65 and 7-66 backfilling cost. During reclamation the subsoils or backfill material will be laid in 12" to 18" lifts and compacted through repeated travel of heavy equipment. In areas with slopes of less than 30% the subsoil will be ripped to a depth of 18" prior to topsoil placement. In areas having an average slope of more than 30% the subsoil will be ripped to a depth over 12". The East Mountain area has been fully back graded and remains stable as detailed in the 2014 Annual report. The Burma Pond and Castle Valley special service district water treatment plant final reclamation needs to be updated to reflect updated operations and life expectancy as addressed in hydrology deficiencies. The Water treatment area does not contemplate the volume required to backfill the current treatment pond shown on Plate 5-3 to achieve AOC shown on plate 5-17. Volumes of the loadout area need to be updated.

cparker

Backfill and Grading on Steep Slopes

Analysis:

The minimum requirements of R645-301-553.200 are met within the current MRP as there is no change to the existing MRP grading reclamation details. Prior to backfilling of highwall areas above the portals and cutslopes all slope stability improvements will be removed such as shotcrete, wire mesh, clips, and other slope stability measures. All noncombustible material generated from the removal of shotcrete will be disposed of underground or removed from the site to appropriate State permitted landfill. Plate 5-3 detail highwall locations at the mine site. The slopecut at the USFS trailhead access road will be left in place but the surface will be modified to meet design specification as directed in Appendix 1-2.

cparker

Mine Openings

Analysis:

The minimum requirements of R645-301-529 and -551 are met within the current MRP as there is no change to the existing MRP Chapter 5 Sections 5.41, 5.42.70 and 5.42.71 sealing of mine openings at the time of final reclamation. The MRP Chapter 5 Section 5.41 details how prior to final sealing of any openings, the BLM will be notified and require an onsite inspection and a submission of formal sealing methods for approval of the BLM. The presented plans will include cross section demonstrating the measure taken to seal or manage mine openings to comply with R645-301-529.100.

cparker

Topsoil and Subsoil

Analysis:

Analysis:

The Mining and Reclamation meets the requirements of R645-301-240 for soils redistribution during final reclamation. The MRP itemizes the total disturbed area as 34.47 acres (MRP Chap 1, p. 1-10 or electronic page 19). Of those acres, 11.89 acres were disturbed during the emergency rescue attempt and were reclaimed between 2007 through 2011, See Appendix 5-22A for details.

Fifteen of the 34.47 acres were disturbed for the surface facilities located in Crandall Canyon (MRP Chap 2, Section 2.42, pg 2-10 or electronic page 18), including 1.4 acres of topsoil storage in Crandall Canyon. Redistribution volumes from twelve to sixteen inches at the mine facilities area are reported in Section 2.42, page 2-10. A total stored topsoil volume of 12,912 cu yds is reported in on page 2-11. Refer to Appendix 5-22 for Crandall Canyon surface facility reclamation details.

The remainder of the disturbed acres (7.32 acres) are associated with the Burma Evaporation Basin which is the waste disposal for the [temporary] water treatment facility. Operation and reclamation of the Burma pond is described in Chapter 7 Appendices D, Appendix 7-66 (electronic page 242). Although the Burma evaporation pond disturbed area is recorded as 7.32 acres, the Permittee anticipated soil salvage and redistribution from only 1.41 acres. Redistribution depth of the estimated 1,137 cu yd topsoil would be six inches over the 1.41 acres as described in (Chap. 2). The as-built volumes

requested under Soils Operation Plan, may adjust this depth of final cover.

Appendix 1-16 SITLA Lease (for the Burma Pond) Article 12.2 requires reclamation upon termination of the lease and stipulates 4 feet of cover over the iron precipitate and control of noxious weeds. In accordance with R645-301-542.742, the plan provides for routine compaction of the waste and covering to prevent windborne waste (Chap. 5, p. 8, Item 7) App. 7-66, Chapter 5 describes 2,363 cu yds of subsoil stockpiled in the berm around the pond. This material will cover the 0.5 acre pond area (200ft x 100 ft) to a depth of three feet. Chap. 3 describes replacement of this subsoil in 18 inch lifts over an accumulated layer of dried sludge (estimated to be 24 inches deep after 16 years, Chap. 5). Using the permittee's estimates, of 1.5 inch accumulation per year, the life of this facility is twenty four years, at which time the dried waste will be at the design maximum of 36 inches, leaving 24 inches of freeboard (Chap. 5). (The plan does indicate that there is room for expansion to the east and west within the permitted area.) In accordance with R645-301-542.742, the plan provides for routine compaction of the waste and covering to prevent windborne waste (Chap. 5, p. 8, Item 7). Upon final reclamation, the first 18 inch lift of cover soil will be incorporated into the mine waste with ripping or other tillage (Chap 3, Item b). In this manner, the waste will be incorporated into the soil and will not create a chemical or physical barrier to roots, promoting revegetation success, in accordance R645-301-542.730.

pburton

Road System Reclamation

Analysis:

The minimum requirements of R645-301-534 are met within the current MRP as there is no change to the existing MRP reclamation of roads throughout the permitted area. Chapter 5 Section 5.42.60 details all other roads used for the operation of the Crandall Canyon Mine, within the permit boundaries will be reclaimed in accordance to R645-301-542.610 through -542.640.

cparker

Road System Retention

Analysis:

The minimum requirements of R645-301-534 and -552 are met within the current MRP as there is no change to the existing MRP reclamation of the specific roads to be retained post mining land use in accordance with the Forest Service permit shown in Appendix 1-2. The Forest Service Development Road from Huntington Creek to the Forest Service turn around will remain as part of the post mining land use in accordance with the USFS permit. The final reclamation will include reducing the road width from 27 ft to 22 ft with a 20 ft subgrade and a 14 foot running surface. The MRP states that based on recent correspondence, the USFS prefers to have the asphalt totally removed from the road surface upon final reclamation. All asphalt and subgrade removed from the permit area as part of the road narrowing will be taken to a RCRA approved disposal site. Appendix 5-26 contains additional details of the forest service Tailhead parking.

cparker

Stabilization of Surface Areas

Analysis:

The MRP is in compliance with its description of soil stabilization, however current information is requested in accordance with R645-301-121.100.

The permitted area is 7.32 acres; however the proposed disturbed area is 1.41 acres. App 7-66 describes interim reclamation on the outslope of the pond containment berm during operations. The plan also references interim reclamation of land which does not have topsoil removed, but which may be affected by equipment moving boulders and topsoil from the pond location to storage locations (Chapter 5, Item 6, page 9, elec. page 251)). Chapter 5, Item 9, page 10 (electronic page 252) describes cover of the berm outslope boulders with 6 - 12 inches of subsoil that will receive interim reclamation. In addition, Article 10.2 of the SITLA Lease 1708 (MRP Chapter 1, Appendix 1-16, electronic page 276) requires intermediate reclamation of disturbed areas not required for continuing operations, along with control of noxious weeds.

Chapter 5 item 5 page 8 describes evaluating the status of the need for treatment at the mine and the subsequent need for the disposal site and possible interim reclamation of the disposal site, in the case of temporary cessation (item 6, page 8, electronic page 250). This status is requested during the mid term review, to ensure permit renewal is processed in a timely manner.

Deficiencies Details:

R645-301-244.100 and R645-301-121.100,

- 1) Please provide documentation (narrative and map) of the interim reclamation measures taken on disturbed areas which are not required for continuing operations, along with control of noxious weeds in accordance with Article 10.2 of SITLA Lease 1708 (App. 1-16) and App 7-66, Chapter 5, Item 6, page 9 and item 9 page 10.
- 2) To ensure permit renewal is processed in a timely manner please revise the timing of the evaluation described in App. 7-66, Chapter 5 item 5 and item 6, page 8 (electronic page 250) to the mid-term permit review and please provide said evaluation in response to this mid-term review.

pburton

Cessation of Operations

Analysis:

The minimum requirements of R645-301-515 and -541 are met within the current MRP as there is no change to the existing MRP plan of communication with the appropriate parties in the event of the cessation of operations and final reclamation in Chapter 5 Section 5.15.30

cparker

Maps Affected Area Boundary

Analysis:

The minimum requirements of R645-301-542 are met within the current MRP as there is no change to the existing MRP plan. There are no changes to Plate 5-16, 5-17, 5-17A through 5-17C of the MPR detail the plan and profile views of Phase I and Phase II reclamation activities at the main facilities area.

cparker

Maps Bonded Area

Analysis:

The minimum requirements of R645-301-800 are met within the current MRP as the bonded area as there is no change to the existing MRP plan.

cparker

Maps Reclamation Backfilling and Grading

Analysis:

The minimum requirements of R645-301-542 are met within the current MRP as there is no change to the existing MRP plan of backfilling and grading areas or volumes shown in Plate 5-17 through 5-17C.

cparker

Maps Reclamation Facilities

Analysis:

The minimum requirements of R645-301-542 are met within the current MRP as there is no change to the existing MRP plan of facilities that will remain post mining operations. Plate 5-16 shows Phase I of reclamation and the removal of all facilities at the mine site area.

cparker

Maps Reclamation Final Surface Configuration

Analysis:

The minimum requirements of R645-301-542 are met within the current MRP as there is no change to the existing MRP plan of Plate 5-17 of the estimated final surface configuration back to AOC shown in Plate 5-20.

Maps Reclamation Surface and Subsurface Man Made

Analysis:

The minimum requirements of R645-301-542 are met within the current MRP as there is no change to the existing MRP plan in the surface and or subsurface manmade features within the permit area as detailed on Plate 5-16 and 5-17.

cparker

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 Jay Marshall with experience in underground mining operations.

cparker

Bonding Form of Bond

Analysis:

The current MRP meets the minimum requirements of R645-301-860.100 as the applicant currently maintains a surety bond amount of \$2,802,910 which is held Rockwood Casualty Insurance Co. A performance bond is filed in the amount of \$2,082,910 payable to the state of Utah, Division of Oil, Gas and Mining and the Office of Surface Mining Reclamation and Enforcement. An additional bond in the amount of \$720,000 has been submitted to cover the perpetual treatment of iron mine water discharge.

cparker

Bonding Determination of Amount

Analysis:

The application does not meet the minimum requirements of R645-301-830.140 as the Permittee did not submit detailed bond information. The Division requires an evaluation of the reclamation cost estimate during each midterm permit review. This cost estimate is then escalated for five years or until the next midterm review. In accordance with the requirements of R645-301-830, and -301-830.140, it is the Permittees responsibility to provide detailed estimated cost sheets to support the reclamation cost estimate. The most recent bond activity was a release of \$244,365 for the East mountain bond of \$160,254. The total mine bond is \$1,889,181 in 2015 dollars.

The Permittee must update the unit cost data used in the 2011 Midterm Permit Review reclamation cost estimate to 2015 unit costs using the 2015 R.S. Means Heavy Construction Cost Data manual. All computation sheets for demolition, earthwork and re-vegetation must be updated and submitted to the Division so the Division can determine the required bond amount needed through 2020.

The total reclamation cost for the Crandall Canyon Mine (sum of the direct and indirect costs) must be escalated from 2015 to 2020 (5 years) using an escalation factor of 1.2 %. This escalated cost is rounded to the nearest \$ 1,000 to determine the amount of required bond which must be posted with the Division by the Permittee.

Deficiencies Details:

R645-301-830.140. The application does not meet the minimum requirements of R645-301-830.140 as the Permittee did not submit detailed bond information. The Division requires an evaluation of the reclamation cost estimate during each midterm permit review. This cost estimate is then escalated for five years or until the next midterm review. In accordance with the requirements of R645-301-830, and -301-830.140, it is the Permittees responsibility to provide detailed estimated cost sheets to support the reclamation cost estimate.

The Permittee must update the unit cost data used in the 2011 Midterm Permit Review reclamation cost estimate to 2015 unit costs using the 2015 R.S. Means Heavy Construction Cost Data manual. All computation sheets for demolition, earthwork and re-vegetation must be updated and submitted to the Division so the Division can determine the required bond amount needed through 2020.

The total reclamation cost for the Crandall Canyon Mine (sum of the direct and indirect costs) must be escalated from 2015 to 2020 (5 years) using an escalation factor of 1.2 %. This escalated cost is rounded to the nearest \$ 1,000 to determine the amount of required bond which must be posted with the Division by the Permittee.

In addition to the line item update the Permittee must update relevant Burma Pond and water treatment costs quantities to show the updated operations details as the current MRP operations and bonded amounts do not match current site maintenance activities.

cparker

Bonding Terms and Conditions Liability Insurance

Analysis:

The application meets the minimum requirements of R645-301-850 as the applicant currently holds liability insurance through Federal Insurance Co, effective until 6/1/16. The insurance includes the required Marsh from, explosives and claims made per occurrence.

cparker