

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

November 3rd, 2009

TO: Internal File

THRU: Jim Smith, Permit Supervisor *JCS 11/21/09*

FROM: Steve Christensen, Hydrologist *SCC*

RE: Mine Treatment Facility, Genwal Resources, Inc., Crandall Canyon Mine, C/015/0032, Task ID #3415, Outgoing File

SUMMARY:

On October 15th, 2009, the Division of Oil, Gas and Mining (the Division) received an application to amend the Crandall Canyon mining and reclamation plan (MRP) from Genwal Resources, Inc., (the Permittee). The application calls for the construction of a mine water treatment system at the main Crandall Canyon Mine surface facility.

Following the Crandall Canyon Mine disaster on August 6th, 2007, the mine was de-activated and the portals were sealed. Mine water inflow built up to the extent that it is now discharging from the portals and discharging through a 12" pipe into Crandall Creek. In early 2009, the iron concentrations in the mine water began to increase.

Iron levels in the mine water discharge are currently out of compliance with the Permittee's Utah Pollution Discharge Elimination System permit (UPDES UTU0024368). The Department of Water Quality has issued the Permittee a violation in association with the elevated iron levels. In addition, the Division issued Notice of Violation #10043 (NOV) on August 10th, 2009. The Division's NOV cited a failure to minimize disturbance to the hydrologic balance and diminution or degradation of the quality of surface water. The gravity discharge from the mine portals and its excessive amounts of iron are causing orange staining to occur in the receiving stream. In order to abate the NOV, the Permittee was directed to submit a plan to immediately address and mitigate the iron discharge currently reporting to the Crandall Canyon drainage.

The Permittee has submitted a plan to install and operate a mechanical aeration device known as the "Maelstrom Oxidizer Unit". Mine water is fed into the unit on one end where it then travels over and under baffles. As the water travels through the unit, a large volume of air is forced through the water. The high oxygen content then reacts chemically to change the

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dissolved iron from the ferrous state to the ferric state, which forms iron precipitates, which can then be settled out.

Previously on April 6th, 2009, the Permittee has submitted an application to treat the mine water discharge. The Division performed a technical analysis (Task ID #3261) and determined that there were outstanding deficiencies that needed to be addressed prior to final approval.

As with the April 6th, 2009 application, the current application also outlines the extension of the existing French drain system near the old north portals to collect additional mine seepage water, which is currently discharging to the sediment pond. The Permittee proposes re-routing undisturbed watershed WSUD-3 to the existing surface drainage system for the mine-site. The diversion/pipe system that was collecting the undisturbed drainage was damaged during the sealing and deactivation of the Crandall Canyon Mine after the mine collapse in August of 2007.

The following is a technical evaluation relative to the hydrology regulations of the State of Utah R645-Coal Mining Rules.

Upon review of the amendment, the Division has determined that additional information is necessary in order to comply with the State of Utah R645-Coal Mining Rules. The Permittee must address the following deficiencies prior to receiving final approval from the Division:

DEFICIENCIES:

R645-301-724.100: The Permittee must establish a groundwater monitoring point for the sandstone seep discharge that is to be collected on the ledge located directly above the proposed treatment facility. The Permittee must provide a commitment to supply the Division with the discharge data. As the monitoring of the seepage water will be temporary, the Division will not require that the Permittee submit the data to the electronic water quality database. In consultation with the Division, the Permittee must provide a reasonable timeline, method and frequency for obtaining and supplying the data.

R645-301-751: The Permittee must revise the maintenance/clean-up plan for the proposed settling pond. The previous technical review for a proposed water treatment system (Task ID #3261) identified a deficiency relative to the maintenance/clean-up of the aeration treatment facility. The deficiency stated, *“If the intention is to route the in-mine water directly into the receiving drainage during maintenance of the aeration treatment facility, the Permittee must provide the Division with documentation from the Department of Water Quality (DWQ) that such a practice is acceptable per the terms of their UPDES permit and subsequent violation.”* Page 2 of Appendix 7-65 discusses the bypassing of the mine water (presumably to Crandall Creek). Upon discussions with DWQ staff member Jeff Studenka, this would not be allowed under the terms of the Permittee’s UPDES Permit (UT0024368).

R645-301-751: The Permittee should revise the application to reflect that the proposed treatment facility will be a temporary/operational feature. The November 4th, 2009 final reclamation discussions conducted with the USFS, BLM and DWR, determined that an active treatment system in the location of the old load-out area (as proposed with this permitting action) would not be preferred for final reclamation. As a result, the application should revise language that discusses the potential for '*permanent*' utilization of the proposed treatment system on page 7-47 and page 3 of Appendix 7-65 of the application. The sections should be revised so that it's clear that the proposed system will be utilized in a solely operational capacity.

R645-301-741 and -742.300: The Permittee must revise the application to identify how the storm water runoff generated in undisturbed watershed WSUD-3 will be diverted into the existing disturbed drainage system. The revisions should provide detailed design drawings and a narrative. Revisions to Plate 7-5, *Crandall Canyon Mine Drainage Map*, may be necessary in the event that the re-routing of flow from WSUD-3 will be accomplished with something other than a diversion ditch (as currently depicted on Plate 7-5).

R645-301-742: The Permittee must revise the application and remove the characterizations of the proposed water treatment facility as an ASCA. ASCA is not a defined in the State of Utah R645-Coal Mining Rules. However, the Division finds that the proposed water treatment facility and the scope of its design and operation are beyond the common application of the term 'ASCA'. The application refers to the proposed water treatment system as 'ASCA 12'. Discussion of 'ASCA 12' is found on page 7-46 of the approved MRP, the table of contents, page 2 and page 37 of Appendix 7-65. In addition, 'ASCA 12' is depicted on Plate 7-5, *Crandall Canyon Mine Drainage Map*.

R645-301-742.220: The Permittee must provide up to date survey (not estimated) information regarding the sediment level accumulation in the pond. This information was requested at the time of the previous technical analysis (Task ID #3261). The updated survey information is needed in order to determine whether the pond requires maintenance/cleaning and has the capacity to retain the design storm event (10-year, 24-hour). The application demonstrates that the sediment pond has adequate storage for the proposed re-routing of undisturbed watershed 3 (WSUD-3). However, that is based upon the sediment level in the pond being maintained below its clean-out level. Based upon recent site visits/field inspections by Division staff, the water level in the pond has been observed less than 1 foot below the principal spillway. Annual reports submitted by the Permittee have provided estimated sediment accumulation elevations of 7,767' for 2006, 7,768' for 2007 and 7,768' for 2008 respectively. The sediment clean-out level for the pond is 7,769'. It is highly unlikely that the sediment level has remained constant. The updated survey information will determine if the pond needs to be cleaned out.

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R645-301-742.220: In addition, the Permittee must provide additional design and maintenance information for the proposed settling basin. The additional settling basin information should provide the following:

- A discussion as to how it will be determined when the settling basin is in need of clean-out/maintenance and a commitment to perform such maintenance at that time.
- A discussion of how the clean out of the settling basin will be performed including the associated designs and calculations. (See Above R645-301-751 deficiency for additional discussion).
- A discussion and demonstration as to how the retention time of the settling basin was determined. Page 1 of Appendix 7-65 states, “The unit has been sized according to the anticipated flow rate...” and “The basin has been designed with twice the volume (i.e., retention time) recommended from the bench testing in order to maximize the potential for meeting UPDES compliance levels.” Upon review of the application, it’s not clear what design assumptions and calculations were utilized in designing the settling basin and it’s function.
- Figure 1 of 5 in Attachment 6 of Appendix 7-65 must be revised to accurately depict the location of the precast concrete drop inlet box. Based upon field visits with the Permittee, the structure had to be constructed further down gradient from the spillway.
- Figure 1 of 5 and Figure 2 of 5 in Attachment 6 of Appendix 7-65 must be revised to depict how the seeps from the Star Point Sandstone ledge will be collected. Based upon a recent field visit by Division staff, the Permittee indicated that the seep collection area would be in a different location than as is depicted on the aforementioned figures.
- The Permittee must demonstrate that the proposed utilization of a single open channel spillway meets the criteria established in R645-301-742.223.1.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

The application meets the Permit Application Format and Contents requirements of the State of Utah R645-Coal Mining Rules.

The previous technical review (Task #3261) identified a deficiency on page 5-33. The application had referred to a Figure 7-14, which was not submitted with the package. The new application has an entirely different format and Figure 7-14 is not referred to and/or submitted under this task.

Findings:

The application meets the Permit Application Format and Contents requirements of the State of Utah R645-Coal Mining Rules.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

Topsoil Removal and Storage

The application meets the Topsoil Removal and Storage requirements of the State of Utah R645-Coal Mining Rules.

No topsoil removal or storage will be required with the proposed surface facility alterations.

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Findings:

The application meets the Topsoil Removal and Storage requirements of the State of Utah R645-Coal Mining Rules.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Groundwater Monitoring

The application does not meet the Groundwater Monitoring requirements of the State of Utah R645-Coal Mining Rules.

The Permittee must establish a groundwater monitoring point for the sandstone seep discharge that is to be collected on the ledge located directly above the proposed treatment facility. The Permittee must provide a commitment to supply the Division with the discharge data. As the monitoring of the seepage water will be temporary, the Division will not require that the Permittee submit the data to the electronic water quality database. In consultation with the Division, the Permittee must provide a reasonable timeline, method and frequency for obtaining and supplying the data.

Water-Quality Standards And Effluent Limitations

The application does not meet the Water-Quality Standards and Effluent Limitation requirements of the State of Utah R645-Coal Mining Rules.

The Permittee proposes the construction and utilization of a Maelstrom Oxidizer Unit (the Unit). Attachment 1 of the application provides information regarding the function and utilization of the Unit. The Unit facilitates a mass transfer of oxygen into a liquid to strip carbon dioxide and to oxidize and precipitate metals. Mine-water reports to one end of the Unit where it then travels through a series of baffles. As this is occurring, a large volume of air is forced through the water via a number of nozzles located at the bottom of the Unit. The Unit has been sized according to the anticipated flow rate.

Attachment 2 provides bench test results obtained during the preparation of the application. Mine-water obtained at the Crandall Canyon mine-site was treated with the Unit. Prior to treatment, the mine-water had a total iron concentration of 2.16 milligrams/liter (mg/l) and a dissolved iron concentration of 0.79 mg/l. Following the treatment from the Unit, total iron levels were 0.52 mg/l with a corresponding value of 0.00 mg/l for dissolved iron.

As of now, it's unclear as to what is causing the elevated iron concentrations in the mine-water discharge. One possibility is that the iron concentrations are a result of dissolved pyrites in the coal. If that is the case, it's possible that as the pyrites are leached out, the iron levels will drop back to down to pre-existing compliance levels.

It is the hope that the construction and utilization of the aeration treatment facility under consideration with this permitting action will bring iron levels back into compliance with all federal and state water quality and effluent requirements. Monthly water monitoring (as required per UPDES requirements) of the aeration treatment facility's discharge will indicate whether it is effective. However, the data obtained through the bench tests and the effective utilization of the Unit in other locations is encouraging.

The Permittee must revise the maintenance/clean-up plan for the proposed settling pond. The previous technical review for a proposed water treatment system (Task ID #3261) identified a deficiency relative to the maintenance/clean-up of the aeration treatment facility. The deficiency stated, "*If the intention is to route the in-mine water directly into the receiving drainage during maintenance of the aeration treatment facility, the Permittee must provide the Division with documentation from the Department of Water Quality (DWQ) that such a practice is acceptable per the terms of their UPDES permit and subsequent violation.*" Page 2 of Appendix 7-65 discusses the bypassing of the mine water (presumably to Crandall Creek). Upon discussions with DWQ staff member Jeff Studenka, this would not be allowed under the terms of the Permittee's UPDES Permit (UT0024368).

The previous technical review (Task ID #3261) had also identified a deficiency relative to the temporary nature of the proposed treatment system. The Permittee should revise the application to reflect that the proposed treatment facility will be a temporary/operational feature. The November 4th, 2009 final reclamation discussions conducted with the USFS, BLM and DWR, determined that an active treatment system in the location of the old load-out area (as proposed with this permitting action) would not be preferred for final reclamation. As a result, the application should revise language that discusses the potential for '*permanent*' utilization of the proposed treatment system on page 7-47 and page 3 of Appendix 7-65 of the application. The sections should be revised so that it's clear that the proposed system will be utilized in a solely operational capacity.

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Diversions: General Undisturbed Drainage Discussion

The application does not meet the Diversions: General requirements of the State of Utah R645-Coal Mining Rules.

Following the Crandall Canyon Mine disaster on August 6th, 2007, the mine was deactivated and the portals sealed. According to the Permittee, while constructing the portal seals, much of the UD-3 culvert diversion structure (See Plate 7-5, *Crandall Canyon Drainage Map*) was damaged beyond repair. The application proposes to route the undisturbed drainage from undisturbed watershed WSUD-3 (above the portals) into the existing disturbed drainage network rather than to try and re-establish the drainage back across the portals. The drainage from WSUD-3 will be routed to undisturbed drainage ditch UD-3, then to disturbed drainage ditch DD-8, then to culvert C-1, then to ditch DD-5, then to culvert C-12 and then into the primary sediment pond.

The application provides the updated routing and design calculations for disturbed drainage ditches DD-8 and DD-5 as well as culverts C-1 and C-12. The ditches and culverts are adequately sized to safely pass the 10-year/6-hour design storm event as required by R645-301-742.323.

Several deficiencies relative to the re-routing of undisturbed watershed WSUD-3 were identified during the previous technical review (Task ID #3261) and the Permittee was directed to update the drainage calculations to account for the proposed change.

During the previous technical review, Table 4, *Runoff Summary Drainage to Sediment Pond* in Appendix 7-4, had identified undisturbed watershed WSUD-3 as reporting to the sediment pond. The application has revised Table 4 to account for the additional 0.23 cubic feet per second (cfs) of flow reporting from WSUD-3 to the sediment pond.

The Permittee was further directed to revise Table 5, *Runoff Control Structure Watershed Summary* in Appendix 7-4. The previous application had not identified watershed WSUD-3 as reporting to the sediment pond or disturbed drainage ditch DD-8. The table has been revised to reflect the proposed alteration of the drainage control plan.

Additionally, the Permittee was asked to revise the flow depths and flow areas identified in Figure 3, *Undisturbed and Disturbed Ditch Typical Section*. The application has revised the figure to reflect the proposed alteration of the drainage control plan and additional storm water reporting to disturbed ditches DD-5 and DD-8.

Based upon site inspections conducted at the mine site, the storm water runoff generated in undisturbed watershed WSUD-3 is not being controlled/diverted to the disturbed drainage system. The Permittee must revise the application to identify how the storm water runoff

generated in undisturbed watershed WSUD-3 will be diverted into the existing disturbed drainage system. The revisions should provide detailed design drawings and a narrative. Revisions to Plate 7-5, *Crandall Canyon Mine Drainage Map*, may be necessary in the event that the re-routing of flow from WSUD-3 will be accomplished with something other than a diversion ditch (as currently depicted on Plate 7-5).

Diversions: Miscellaneous Flows

The application meets the Diversions: Miscellaneous Flows requirements of the State of Utah R645-Coal Mining Rules

The previous technical review of the proposed water treatment system (Task ID #3261) identified a deficiency relative to the re-routing of the mine-water to the proposed water treatment system. On page 1 of Appendix 7-65, the Permittee describes how the mine-water discharge will be routed to the proposed treatment facility. A 12" HDPE pipeline will be tapped into the existing discharge line near the upper portals and extend to the proposed treatment facility. The pipeline will be equipped with shutoff valves, which will allow for the flow of the mine-water to be routed to the treatment facility, or bypassed directly to the existing UPDES outfall. Bolts drilled into the ledge rock and epoxied into place directly below the north portals support the pipeline.

The previous technical review also identified a deficiency relative to the collection and routing of the Star Point Sandstone seepage located directly above the proposed aeration treatment facility. The quantification of flow from the seeps is necessary in order to design a final reclamation plan of the old load out area and establish the approximate original contour. To that end, the Permittee has established a concrete trough behind the existing retaining wall between the ledge rock and the back of the wall. The trough will collect this seepage water and route it through the wall and into the settling basin. In doing so, the seepage water can be monitored. Engineered drawings in Attachment 6 of the application depict the location and flow path generated with the construction of the trough. The concrete trough is discussed on page 3 of Appendix 7-65.

Sediment Control Measures

The application **does not meet** the Sediment Control Measures of the State of Utah R645-Coal Mining Rules.

The application refers to and categorizes the proposed water treatment facility as an Alternative Sediment Control (ASCA). The Permittee must revise the application and remove the characterizations of the proposed water treatment facility as an ASCA. ASCA is not defined in the State of Utah R645-Coal Mining Rules. However, the Division finds that the proposed water treatment facility and the scope of its design and operation are beyond the common application

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of the term 'ASCA'. The application refers to the proposed water treatment system as 'ASCA 12'. Discussion of 'ASCA 12' is found on page 7-46 of the approved MRP, the table of contents, page 2 and page 37 of Appendix 7-65. In addition, 'ASCA 12' is depicted on Plate 7-5, *Crandall Canyon Mine Drainage Map*.

The previous hydrologic analysis (Task ID #3261) had identified deficiencies relative to the base material and barricade/embankment construction of the proposed water treatment facility and adjacent roadway. The current application and proposed design for the water treatment facility varies significantly from the previous submittal. The aforementioned deficiencies are currently under review by Division staff engineer Mr. James Owen. Mr. Owen has identified deficiencies relative to the construction of the embankment and base material.

Technical analysis Task ID #3261 identified a deficiency relative to the construction of the proposed water treatment facility. At that time, the Permittee had proposed the utilization of "precast concrete parking curbs (wheel stops)" to facilitate the oxidation of the mine-water discharge. The current application under review proposes the utilization of a Maelstrom Oxidizer Unit. As such, the aforementioned deficiency is no longer applicable.

Ponds, Impoundments, Banks, Dams, and Embankments

The application does not meet the Ponds, Impoundments, Banks, Dams and Embankment requirements of the State of Utah R645-Coal Mining Rules.

During the sealing and deactivation of the Crandall Canyon Mine following the disaster in August of 2007, undisturbed drainage culvert UD-3 was damaged beyond repair. As a result, the Permittee proposes to route the undisturbed drainage from undisturbed watershed 3 (WSUD-3) into the surface drainage system for the mine facility. The undisturbed flow would flow from culvert UD-3 to culvert C-1 to disturbed drainage ditch DD-5 to culvert C-12 and on to the sediment pond. Based upon the approved sediment pond information contained within the MRP and from field observations and recent Division field inspections, the Permittee must provide more information.

The Permittee must provide up to date survey (not estimated) information regarding the sediment level accumulation in the pond. The updated survey information is needed in order to determine whether the pond requires maintenance/cleaning and has the capacity to retain the design storm event (10-year, 24-hour). The application demonstrates that the sediment pond has adequate storage for the proposed re-routing of undisturbed watershed 3 (WSUD-3). However, that is based upon the sediment level in the pond being maintained below its clean-out level. Based upon recent site visits/field inspections by Division staff, the water level in the pond has been observed less than 1 foot below the principal spillway. Annual reports submitted by the Permittee have provided estimated sediment accumulation elevations of 7,767' for 2006, 7,768' for 2007 and 7,768' for 2008 respectively. The sediment clean-out level for the pond is 7,769'.

It is highly unlikely that the sediment level has remained constant. The updated survey information will determine if the pond needs to be cleaned out.

In addition, the Permittee must provide additional design and maintenance information for the proposed settling basin. The additional settling basin information should provide the following:

- A discussion as to how it will be determined when the settling basin is in need of clean-out/maintenance and a commitment to perform such maintenance at that time.
- A discussion of how the clean out of the settling basin will be performed including the associated designs and calculations. (See Above R645-301-751 deficiency for additional discussion).
- A discussion and demonstration as to how the retention time of the settling basin was determined. Page 1 of Appendix 7-65 states, "The unit has been sized according to the anticipated flow rate..." and "The basin has been designed with twice the volume (i.e., retention time) recommended from the bench testing in order to maximize the potential for meeting UPDES compliance levels." Upon review of the application, it's not clear what design assumptions and calculations were utilized in designing the settling basin and it's function.
- Figure 1 of 5 in Attachment 6 of Appendix 7-65 must be revised to accurately depict the location of the precast concrete drop inlet box. Based upon field visits with the Permittee, the structure had to be constructed further down gradient from the spillway.
- Figure 1 of 5 and Figure 2 of 5 in Attachment 6 of Appendix 7-65 must be revised to depict how the seeps from the Star Point Sandstone ledge will be collected. Based upon a recent field visit by Division staff, the Permittee indicated that the seep collection area would be in a different location as is depicted on the aforementioned figures.

Findings:

The application **does not meet** the Hydrologic Information requirements of the State of Utah R645-Coal Mining Rules. The following deficiencies must be addressed prior to Division approval:

R645-301-724.100: The Permittee must establish a groundwater monitoring point for the sandstone seep discharge that is to be collected on the ledge located directly above the proposed treatment facility. The Permittee must provide a commitment to supply the Division with the discharge data. As the monitoring of the seepage water will be temporary, the Division will not require that the Permittee submit the data to the electronic water quality database. In

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consultation with the Division, the Permittee must provide a reasonable timeline, method and frequency for obtaining and supplying the data.

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R645-301-742: The Permittee must revise the application and remove the characterizations of the proposed water treatment facility as an ASCA. ASCA is not a defined in the State of Utah R645-Coal Mining Rules. However, the Division finds that the proposed water treatment facility and the scope of its design and operation are beyond the common application of the term ‘ASCA’. The application refers to the proposed water treatment system as ‘ASCA 12’. Discussion of ‘ASCA 12’ is found on page 7-46 of the approved MRP, the table of contents, page 2 and page 37 of Appendix 7-65. In addition, ‘ASCA 12’ is depicted on Plate 7-5, *Crandall Canyon Mine Drainage Map*.

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information is needed in order to determine whether the pond requires maintenance/cleaning and has the capacity to retain the design storm event (10-year, 24-hour). The application demonstrates that the sediment pond has adequate storage for the proposed re-routing of undisturbed watershed 3 (WSUD-3). However, that is based upon the sediment level in the pond being maintained below its clean-out level. Based upon recent site visits/field inspections by Division staff, the water level in the pond has been observed less than 1 foot below the principal spillway. Annual reports submitted by the Permittee have provided estimated sediment accumulation elevations of 7,767' for 2006, 7,768' for 2007 and 7,768' for 2008 respectively. The sediment clean-out level for the pond is 7,769'. It is highly unlikely that the sediment level has remained constant. The updated survey information will determine if the pond needs to be cleaned out.

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- Figure 1 of 5 and Figure 2 of 5 in Attachment 6 of Appendix 7-65 must be revised to depict how the seeps from the Star Point Sandstone ledge will be collected. Based upon a recent field visit by Division staff, the Permittee indicated that the seep collection area would be in a different location as is depicted on the aforementioned figures.
- The Permittee must demonstrate that the proposed utilization of a single open channel spillway meets the criteria established in R645-301-742.223.1.

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MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Mining Facilities Maps

The application meets the Mining Facilities Maps requirements of the State of Utah R645-Coal Mining Rules.

Plate 5-3, Crandall Canyon Mine Surface Facilities and Plate 7-5, Crandall Canyon Mine Drainage Map have been revised to reflect the proposed aeration treatment facility as well as the re-routing of the undisturbed drainage from watershed WSUD-3.

Certification Requirements

The application meets the Certification Requirements of the State of Utah R645-Coal Mining Rules.

Revisions to Plates 5-3, Crandall Canyon Mine Surface Facilities and Plate 7-5, *Crandall Canyon Mine Drainage Map* were signed and stamped by Mr. David Hibbs (Utah registered professional engineer). In addition, Figures 7-13a thru 7-13d, *Mine-Water Discharge Treatment Facility*, were signed and stamped by Mr. Hibbs.

Findings:

The application meets the Maps, Plans and Cross Sections of Mining Operations requirements of the State of Utah R645-Coal Mining Rules.

RECLAMATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Hydrologic Reclamation Plan

The application meets the Hydrologic Reclamation Plan requirements of the State of Utah R645-Coal Mining Rules.

On page 4 of Appendix 7-65, the Permittee discusses the reclamation of the proposed water treatment facility. Due to the relatively amount of material utilized in the construction of the treatment facility (i.e. less than 500 cubic yards of material for the embankment, small pre-fabricated Maelstrom unit that's easily transported etc.) and the relatively small size of the entire treatment facility, the effort to reclaim the site will be minor.

Findings:

The application meets the Hydrologic Reclamation Plan requirements of the State of Utah R645-Coal Mining Rules.

RECOMMENDATIONS:

The application does not meet the requirements of the State of Utah R645-Coal Mining Rules. The Permittee must address the aforementioned deficiencies prior to obtaining Division approval.