

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

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February 14, 2005

TO: Internal File

THRU: D. Wayne Hedberg, Permit Supervisor

THRU: Joe Helfrich, Team Lead

FROM: Steve Fluke, Reclamation Hydrogeologist

RE: IBC- Crandall Canyon Mine Modification to Lease U-68082, Genwal Resources, Inc., Crandall Canyon Mine, C/015/0032, Task ID #2154

### **SUMMARY:**

The Division of Oil, Gas and Mining (the Division) received an Incidental Boundary Change (IBC) application on October 22, 2004 from Genwal Resources, Inc. (Genwal) for the Crandall Canyon Mine. The IBC requests a modification of their mining and reclamation plan to include a 120-acre area to Lease U-68082. The Division originally assigned the IBC application Task ID #2057. The application was reviewed with deficiencies three times before the Manti-LaSal Forest Service (F.S.) provided their comments on the amendment to the Division on January 19, 2005. This is the fifth review addressing the hydrology section of the amendment and includes Genwal's latest response submitted on February 11, 2005 (Task ID #2154).

The proposed amendment meets the minimum requirements of the Coal Mining Rules and should be approved.

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**TECHNICAL ANALYSIS:**

**ENVIRONMENTAL RESOURCE INFORMATION**

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

**HYDROLOGIC RESOURCE INFORMATION**

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

**Analysis:**

**Sampling and Analysis**

The Permittee has committed, at the Division's request, to a water monitoring plan that includes quarterly monitoring for flow and field parameters of spring sites SP-18 and SP-22 and a stream site for Shingle Creek located just downstream of spring site SP-18 and the confluence of the left and right forks of Shingle Creek. Section 7.31.21, Groundwater Monitoring Plan, has been updated at the Division's request (Task ID#2132) to include the Shingle Creek spring monitoring stations in the MRP.

**Baseline Information**

Baseline information of the premining groundwater and surface water features within and adjacent to the 120-acre addition is included as Appendix 7-64, Baseline Information for the U-68082 Lease Mod Area. Appendix 7-64 identifies and shows the locations of seeps, springs, surface water, and drainages that have been monitored within and adjacent to the lease area since 1985. Baseline monitoring of the seeps and springs was collected during June and October 1985, June and September/October 1993, and May 2004. No-Name Creek was monitored during May, June, and July of 2004. The tabulated baseline data presents discharge, flow, and field parameter (including temperature, pH, and conductivity) data available for each monitoring site.

Appendix 7-64 references annotated photographs of selected springs, seeps, and surface monitoring sites (page 2) and surface water laboratory analytical results (page 4) that were not initially included in the baseline data report for Task ID #2057. The photographs have been submitted with the response to the TA submitted on December 17, 2004 (Task ID # 2090) and the laboratory analytical results have been submitted with the response to the TA submitted on January 18, 2005 (Task ID # 2128).

In Section 7.24.1, Groundwater Information, Methodology, the last paragraph references a seep and spring survey conducted in the area around the IBC area. In order to address a deficiency

listed in the TA for Task ID #2057, this IBC has been identified as Federal Right-of-Way UTU-77975 in the December 17, 2004 submittal.

The listing of water rights in and adjacent to the 120-acre addition, as obtained from the Utah Division of Water Rights (DWRi), is included on the groundwater and surface water rights maps (Plates 7-14 and 7-15, respectively), and the tabulated listing of surface water rights (Table 7-6). Appendix 7-1, Water Rights Information, includes the water rights information obtained from the DWRi for the 120-acre addition.

### **Baseline Cumulative Impact Area Information**

The Division needs to update the East Mountain CHIA to incorporate the expansion of the Crandall Canyon Mine into the U-68082 Lease Mod Area. Hydrogeologic information provided by the amendment is adequate for the Division to complete this update.

### **Modeling**

No hydrogeologic modeling is provided for the 120-acre addition.

### **Probable Hydrologic Consequences Determination**

The Probable Hydrologic Consequences Determination (PHC) has been updated to include reference to the U-68082 lease mod area. No new information describing the probable hydrologic consequences of mining within the 120-acre area is presented except to mention that the drainages in the U-68082 lease mod area are all ephemeral or intermittent. The PHC Determination adequately describes the surface and groundwater conditions of the 120-acre addition.

### **Groundwater Monitoring Plan**

According to Map 7-12, Seep and Spring Locations, and Appendix 7-64, Baseline Information for the U-68082 Lease Mod Area, eight seeps and springs have been inventoried within the 120-acre addition as part of the 1985 inventory. Three of these seeps and springs (SP-15, SP-22, and SP-23) are located in the Blackhawk Formation within the potential subsidence area of the 120-acre addition. The baseline data indicates that none of these three springs and seeps are considered significant. In addition, spring SP-22 is the only spring of the three with measurable flow in May 2004 and is located approximately 400 feet above the Hiawatha coal seam (greater than sixty times the estimated coal seam thickness of five feet). Springs SP-15 and SP-22 appear to be located at the east boundary of the potential subsidence area. Based on the low flow reported for the springs in the area, because the springs do not appear to discharge from a significant groundwater system, and the low likelihood that the groundwater discharge at the springs would be diverted to the mine workings through mine-induced fractures, the Division

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does not recommend additional groundwater monitoring. However, the Forest Service owns water rights for Shingle Creek and believes that contributing springs in the canyon should be protected. The Division, in consultation with the Forest Service, has agreed that a water monitoring plan for Shingle Canyon should be incorporated in the MRP for the Crandall Canyon Mine. The Permittee has committed, at the Division's request, to a water monitoring plan that includes quarterly monitoring for flow and field parameters of spring sites SP-18 and SP-22 and a stream site for Shingle Creek located just downstream of spring site SP-18 and the confluence of the left and right forks of Shingle Creek. Section 7.31.21, Groundwater Monitoring Plan, has been updated at the Division's request (Task ID#2132) to include the Shingle Creek spring monitoring stations in the MRP.

### **Surface-Water Monitoring Plan**

Shingle Creek (also referred to as No-Name Canyon Creek in Appendix 7-64) is an intermittent creek that branches into a right and left fork at the east boundary of the 120-acre addition. The right and left forks are steep with an estimated 2:1 gradient. Monitoring during spring runoff in May 2004 is reported in Appendix 7-64 and shows the right and left forks of No-Name Creek flowing at 1.69 gpm and 24.4 gpm, respectively. Flow near the confluence of Shingle Creek with Huntington Creek was measured at 17.8 gpm the same day indicating that No-Name Creek is likely a losing stream. As reported in Appendix 7-64, field observations and the meager spring discharge at the time of surface monitoring indicate that much of the measured flow in Shingle Creek is due to surface runoff from spring snowmelt. Because Shingle Creek is intermittent, and only a portion of the upper reaches of the right and left forks flows within the potential subsidence area, the Division does not recommend additional surface water monitoring. However, the Forest Service owns water rights for Shingle Creek and believes that contributing springs in the canyon should be protected. The Division, in consultation with the Forest Service, has agreed that a water monitoring plan for Shingle Canyon should be incorporated in the MRP for the Crandall Canyon Mine. The Permittee has committed, at the Division's request, to a water monitoring plan that includes quarterly monitoring for flow and field parameters of spring sites SP-18 and SP-22 and a stream site for Shingle Creek located just downstream of spring site SP-18 and the confluence of the left and right forks of Shingle Creek. Section 7.31.22, Surface Water Monitoring Plan, has been updated at the Division's request (Task ID#2132) to include the Shingle Creek monitoring station in the MRP.

### **Findings:**

The Hydrologic Resource Information has been sufficiently addressed meet the requirements of the Coal Mining Rules.

### **MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

## **Analysis:**

### **Monitoring and Sampling Location Maps**

Plate 7-12 shows the seep and spring locations for the Crandall Canyon mine and surrounding area. The baseline seep and spring locations for the U-68082 Lease Mod Area are shown on this plate as well as in Appendix 7-64. Additional hydrologic monitoring for two springs sites (SP-18 and SP-22) and a stream site located downstream of spring site SP-18 and the confluence of the left and right forks of Shingle Creek are needed. These three water monitoring sites have been added to Plates 7-12 and 7-18 as identified in their water monitoring plan for Shingle Creek.

### **Subsurface Water Resource Maps**

Plate 7-14, Groundwater Rights, includes the boundary of the U-68082 Lease Mod Area. No groundwater right is shown on the plate for the 120-acre addition.

### **Surface Water Resource Maps**

Plate 7-15, Surface Water Rights, includes the water rights and boundary of the U-68082 Lease Mod Area. One surface right (93-1180) is shown for No-Name Creek (Shingle Creek) within the 120-acre addition. The right is for the USA Forest Service for the purpose of stockwatering.

### **Well Maps**

No water monitoring wells are proposed for the U-68082 Lease Mod Area.

## **Findings:**

The Maps, Plans, and Cross Sections of Resource Information has been sufficiently addressed meet the requirements of the Coal Mining Rules.

# **OPERATION PLAN**

## **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, -300-147, -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.

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**Analysis:**

**Groundwater Monitoring**

The Division, in consultation with the Forest Service, has agreed that a water monitoring plan for Shingle Canyon should be incorporated in the MRP for the Crandall Canyon Mine. The Permittee has committed, at the Division's request, to a water monitoring plan that includes quarterly monitoring for flow and field parameters of spring sites SP-18 and SP-22 and a stream site for Shingle Creek located just downstream of spring site SP-18 and the confluence of the left and right forks of Shingle Creek. Section 7.31.21, Groundwater Monitoring Plan, has been updated at the Division's request (Task ID#2132) to include the Shingle Creek spring monitoring stations in the MRP.

**Surface Water Monitoring**

The Division, in consultation with the Forest Service, has agreed that a water monitoring plan for Shingle Canyon should be incorporated in the MRP for the Crandall Canyon Mine. The Permittee has committed, at the Division's request, to a water monitoring plan that includes quarterly monitoring for flow and field parameters of spring sites SP-18 and SP-22 and a stream site for Shingle Creek located just downstream of spring site SP-18 and the confluence of the left and right forks of Shingle Creek. Section 7.31.22, Surface Water Monitoring Plan, has been updated at the Division's request (Task ID#2132) to include the Shingle Creek monitoring station in the MRP.

**Diversions: Perennial and Intermittent Streams**

No new disturbed surface areas are proposed for the U-68082 Lease Mod Area.

**Stream Buffer Zones**

No underground mining within 100 feet of a perennial stream is proposed for the U-68082 Lease Mod Area.

**Findings:**

The Hydrologic Information has been sufficiently addressed meet the requirements of the 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**

No update to the existing hydrologic reclamation plan was submitted because no new surface disturbance is planned for the U-68082 Lease Mod Area.

#### **Findings:**

The permittee has submitted sufficient information to address this section.

## CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

#### **Analysis:**

The Division needs to update the East Mountain Cumulative Hydrologic Impact Assessment (CHIA) to incorporate the expansion of the Crandall Canyon Mine into the U-68082 Lease Mod Area. Hydrogeologic information provided by the amendment is adequate for the Division to complete this update.

#### **Findings:**

The information reported meets the minimum CHIA requirements of the Regulations.

#### **RECOMMENDATIONS:**

The proposed amendment meets the minimum requirements of the Coal Mining Rules for hydrology and should be approved.