

# 3732  
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# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

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February 2, 2011

TO: Internal File

THRU: Steve Christensen, Mine Lead *SKC*  
Jim Smith, Coal Permit Supervisor *JS 02/03/11*  
Daron Haddock, Coal Program Manager *DH*

FROM: Kevin Lundmark, Environmental Scientist II *KWL*

RE: Work Plan for Hydrogeologic Study, Genwal Resources, Inc., Crandall Canyon Mine, C/015/0032 Task ID #3732

## SUMMARY:

On January 26, 2011 the Division received a letter from the legal counsel of Genwal Resources, Inc. (the Permittee) providing a hydrogeologic work plan (the Work Plan) for the Crandall Canyon Mine. The Work Plan was submitted by the Permittee pursuant to a request made by the Division in a letter dated December 21, 2010. The objective of the Work Plan is to provide information necessary to update the Probable Hydrologic Consequences (PHC) determination for the Crandall Canyon mine to describe the ongoing mine water discharge from the sealed north portals, as required by Division Order DO-10A.

The Permittee previously submitted a PHC update on November 30, 2010 (Task ID #3704); however, this submittal was found to not meet the requirements of DO-10A and was returned as deficient on December 7, 2010. The Division met with the Permittee on December 8, 2010 to discuss the deficiencies identified with the November 30, 2010 submittal and agreed that the Permittee would submit a timeline for responding to these deficiencies. The Division received a letter from the Permittee on December 9, 2010 proposing to update the PHC in November 2011. The Division responded by letter on December 21, 2010 that the Permittee must: update selected portions of the PHC with available data by January 6, 2011; provide a work plan for the hydrologic investigation by January 27, 2011; and complete revisions to the PHC by November 2011. The Permittee responded to the deficiencies identified in the Division's December 7, 2010 letter and the schedule prescribed by the Division's December 21, 2010 letter by submitting a revised PHC (Task ID # 3724) and the Work Plan (Task ID # 3732). This memo reviews only the Work Plan.

The information submitted does not meet the minimum requirements of the R645 Coal Mining Rules and is not recommended for approval at this time. The Permittee must address the following the deficiency:

**R645-301-121, R645-301-724.500 and R645-301-725.300** The Permittee must revise the Work Plan to:

1. Include a map showing:
  - Mine inflow area;
  - Area overlying and adjacent to mine inflow area where investigation will be performed;
  - Known important geologic and hydrogeologic features;
  - Extent of underground workings;
  - Locations of water-bearing faults identified underground at Crandall Canyon Mine; and
  - Location and identification of historical spring and stream sampling sites to which 2011 data will be compared.
2. List the geologic and hydrogeologic features which will be mapped during the 2011 field season;
3. Identify the specific field water quality parameters and laboratory analyses to be performed for the mine water discharge and springs and streams overlying and adjacent to mine inflow area;
4. Identify the historic information from the area overlying and adjacent to mine inflow area to which the 2011 data will be compared; including the site location IDs, year(s) monitored / sampled, and report reference(s); and
5. Describe the scope, method(s) and location/extent for the stream channel morphology investigation.

### **TECHNICAL ANALYSIS:**

Throughout this memo, "Work Plan" refers to the Work Plan for Hydrogeologic Study received by the Division on January 26, 2011. The term "Study Area" refers to the Area overlying and adjacent to mine inflow area where investigation will be performed.

### **REPORTING OF TECHNICAL DATA**

Regulatory Reference: 30 CFR 777.13; R645-301-130.

#### **Analysis:**

The Work Plan was reportedly prepared by Erik Petersen, who has been retained by Genwal Resources to study the source of mine water discharge. Mr. Petersen's name or company (Petersen Hydrologic) do not appear anywhere in the Work Plan.

#### **Findings**

The information submitted meets the minimum requirements for Reporting of Technical Data.

### **MAPS AND PLANS**

Regulatory Reference: 30 CFR 777.14; R645-301-140.

#### **Analysis:**

The Work Plan lacks sufficient details in order for the Division to determine whether it will meet its stated objectives. The missing information is enumerated in the deficiency list included with this memo. No map or figure was submitted with the work plan. A map or maps need to be included with the Work Plan which shows the following:

- Mine inflow area;
- Area overlying and adjacent to mine inflow area where investigation will be performed (the "Study Area");
- Known important geologic and hydrogeologic features;
- Extent of underground workings;
- Locations of water-bearing faults identified underground at Crandall Canyon Mine; and
- Locations and identifiers for historical spring and stream sampling sites to which 2011 data will be compared.

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**Findings:**

The information submitted does not meet the minimum requirements for Maps and Plans.

**ENVIRONMENTAL RESOURCE INFORMATION**

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

**GEOLOGIC RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

**Analysis:**

The Work Plan states that important geologic and hydrogeologic features will be identified and mapped; however, the types of features are not specified. No information regarding the known locations and types of important geologic and hydrogeologic features is included in the Work Plan.

**Findings:**

The information submitted does not meet the minimum requirements for Geologic Resource Information.

**HYDROLOGIC RESOURCE INFORMATION**

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

**Analysis:**

**Sampling and Analysis**

Specific field water quality parameters and laboratory analyses are not identified in the Work Plan.

**Baseline Information**

The Work Plan refers to baseline (existing) information by stating that comparisons will be made with "historical information" from springs and streams overlying and adjacent to mine inflow areas, and that new information will be compiled and analyzed with "previously existing hydrogeologic data". The specific baseline data sets proposed for comparison and compilation are not identified.

### **Cumulative Impact Area Information**

The Permittee proposes to gather and submit hydrologic and geologic information for the cumulative impact area necessary to assess the probable cumulative hydrologic impacts of the mining operation on surface water and groundwater systems.

### **Modeling**

The Work Plan states that data collected for the 2011 investigation “will be compiled and analyzed together with previously existing hydrogeologic data as part of a comprehensive hydrogeologic investigation”; however, the Work Plan does not provide any description of the modeling or other evaluations for which the data will be used. Previous PHC updates for the Crandall Canyon mine have included modeling to evaluate groundwater ages (using  $^{13}\text{C}$  and  $^{14}\text{C}$  isotope data) and mineral saturation indices (using the WATEQF computer program).

### **Probable Hydrologic Consequences Determination**

The Work Plan was submitted, at the Division’s request, to describe the investigation to be completed by the Permittee to collect information necessary to update the PHC for Crandall Canyon Mine.

### **Groundwater and Surface-Water Monitoring Plan**

The Work Plan states that discharge and field water quality data will be collected from springs streams in the Study Area. Specific field water quality parameters and laboratory analyses are not identified in the Work Plan. Previously, surface water monitoring has included the field water quality parameters of temperature, specific conductance, pH and dissolved oxygen. Laboratory analyses have included typical cations/anions (sodium, potassium, calcium, magnesium, chloride, sulfate, carbonate/bicarbonate), selected metals (iron, aluminum, manganese), and environmental isotopes ( $^3\text{H}$ ,  $^2\text{H}$ ,  $^{18}\text{O}$ ,  $^{13}\text{C}$ ,  $^{14}\text{C}$ ).

### **Findings:**

The information submitted does not meet the minimum requirements for Hydrologic Resources Information.

### **RECOMMENDATIONS:**

The information submitted does not meet the minimum requirements of the R645 Coal Mining Rules and is not recommended for approval at this time. The Permittee must address the following the deficiency:

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2. List the geologic and hydrogeologic features which will be mapped during the 2011 field season;
3. Identify the specific field water quality parameters and laboratory analyses to be performed for the mine water discharge and springs and streams overlying and adjacent to mine inflow area;
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