

# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

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November 10, 2008

TO: Internal File

THRU: James D. Smith, Permit Supervisor

FROM: *AA* April A. Abate, Environmental Scientist/Hydrologist

SUBJECT: Amendment to Install a Gob Gas Vent Hole, West Ridge Resources, Inc., West Ridge Mine, C/007/0041, Task ID #3077

## SUMMARY:

On October 22, 2008, West Ridge Resources, Inc. (the Permittee) provided the Division of Oil, Gas and Mining (the Division) with an amendment proposing the installation of a gob gas vent hole (GVH) well site located in the right fork of Bear Canyon within the permitted boundary of the West Ridge mining operation. The amendment proposes to install a series of three 45-degree angle directional boreholes into a longwall coal panel, which has previously been mined out. The GVH project area will consist of the well pad and associated drill holes. The drill holes will be plumbed to four methane degasification units via a system of piping and constructed adjacent to the well pad. The purpose of the GVH project is to vent methane gas from the underground workings of the mine below. The GVH project area and the majority of Bear Canyon Road are located on School Institute Trust Lands Administration (SITLA) land.

The application proposes to cut into the slope located adjacent to the south side of Bear Canyon Road and remove topsoil and bedrock from the ledge in order to provide an adequate amount of space for the installation of the GVH well pad and methane degasification units. A ditch is to be constructed along the toe of the slope in order to catch runoff from the south side of Bear Canyon. Topsoil from the ledge will be transported to a location further down Bear Canyon Road. The topsoil will be staged adjacent to the road and surrounded by a berm in order to contain runoff. The proposed disturbed area for the GVH project (including the topsoil staging area) is estimated to total 0.34 acres.

Division staff and the mine operator met to discuss the project on an October 16, 2008 field visit. The operator agreed to alternate sediment control measures due to the limited space available in the GVH project area. Sediment control measures agreed upon included: lining the entire ditch with riprap, gravel the entire GVH project area once construction is complete, and placement of excelsior logs along the drainage channel at 50-foot intervals in order to reduce the flow of sediment along the length of the channel. The drainage channel's ultimate discharge will be the natural ephemeral channel that crosses the road near the southwestern edge of the GVH

**TECHNICAL MEMO**

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project area. During the reclamation phase of the project, the operator agreed to dig and haul away any petroleum-stained gravel found on the surface prior to the gravel removal and the decommissioning of the gob vent wells.

The analysis of this amendment has been assigned a review number of Task ID #3077. The hydrologic information provided in the Amendment to Allow Installation of a Gob Gas Vent Hole application meets the State of Utah R645-Coal Mining Rules. The application should be approved at this time.

**TECHNICAL MEMO**

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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.

**GENERAL**

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

**Analysis:**

The application meets the hydrology requirements for general information as provided in R645-301-721. The application provides a reference to Attachment 7-1 of the approved Mining and Reclamation Plan (MRP) discussing the hydrological resources of the West Ridge Mine permit area. The Permittee provides updated references to Appendix 7-11 and 7-12 that describe the hydrology and drainage systems in the GVH project area. Map 7-3 in the application shows existing water rights within and in the vicinity of the permit area. Map 7-5 depicts a spring and seep survey of the area. Map 7-6 depicts a Hydrologic Monitoring Map showing the closest pre-mining water monitoring location as an ephemeral stream monitoring point (M-2) located approximately 6,000 feet southwest of the project area along Bear Canyon Road. Map 7-7 depicts an Operational Monitoring Location map showing that there are two intermittent stream flow monitoring stations (ST-11 and ST-13) along Bear Canyon Road. The closest being ST-11, located approximately 600 feet from the GVH project area.

A report prepared by Peterson Hydrologic, LLC of Lehi, Utah on October 15, 2008 for West Ridge Resources, Inc. evaluates the Probable Hydrologic Consequences (PHC) for the GVH project area. The report concludes that the stream channel located in the right fork of Bear Canyon is ephemeral.

The application provides cross-section maps in Appendix 5-14 depicting profiles of Bear Canyon Road in the vicinity of the GVH project area. The slope profiles illustrate the pre-construction and post-construction profiles of the cut slope.

**Findings:**

Environmental Description [R645-301-720]: The application meets the requirements of R645-301-721-Environmental Description with one minor note: Data from the ST-11 and ST-13

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TECHNICAL MEMO

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monitoring points was available for the past three years in the spring, summer and fall months, which supports the assertion in the Peterson report that the stream is ephemeral. However these points are labeled as Intermittent Stream flow monitoring points on Map 7-7. The data points on the map should be corrected to reflect that the monitoring points are ephemeral.

## **CLIMATOLOGICAL RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.18; R645-301-724.

### **Analysis:**

No references to climatological resources were noted in the application. However references to climatological data found in the MRP would apply to the GVH project area, as a result, the application meets the hydrology requirements for Climatological Resource Information as provided in R645-301-724.

### **Findings:**

Climatological Resource Information [R645-301-724]: The hydrologic information provided does meet the Climatological Resource Information requirements as provided in R645-301-724.

## **GEOLOGIC RESOURCE INFORMATION**

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

### **Analysis:**

Geologic information related to the GVH project area is presented in Chapter 6 of the application as well as in Chapter 6 of the approved MRP.

### **Findings:**

Geologic Resources [R645-301-724]: The information provided meets the Geologic Resource Information requirements as provided in.

**TECHNICAL MEMO**

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**HYDROLOGIC RESOURCE INFORMATION**

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

**Analysis:**

**Sampling and Analysis**

Page 7-v of the application provides a reference to Appendix 7-2 and 7-3 of the approved MRP with regard to Sampling and Analysis. Section 723 of the approved MRP states that water samples will be collected and analyzed according to the methods outlined in "Standard Methods for the Examination of Water and Wastewater" and 40 CFR parts 136 and 434.

**Baseline Information**

The application provides a reference to a report included in Appendix 7-11 prepared by Peterson Hydrologic, LLC regarding baseline hydrological data performed on the GVH project area.

**Baseline Cumulative Impact Area Information**

The application meets the Environmental Description requirements for Baseline Cumulative Impact Area Information (CHIA). The cumulative impact area (CIA) currently in place for the West Ridge Mine covers the proposed GVH project area and the information required for the Division to develop a Cumulative Hydrologic Impact Assessment (CHIA) presented in the approved MRP. Chapters 6 and 7 of the MRP provide the hydrologic and geologic information required by the Division to develop a CHIA.

**Probable Hydrologic Consequences Determination**

The application meets the hydrology Environmental Description requirements for PHC as provided in R645-301-728.300. The application references the Peterson report in Attachment 10, which discusses the subsections of the probable hydrologic consequences regulations. A spring and seep survey of the area was presented on Map 7-5. Two small seeps which discharge less than 1 gallon per minute were identified in the upper forks of Bear Canyon, however these seeps are associated with the Price River Formation and located topography above the GVH project area. The seeps are not considered to be of concern to the GVH project area. Surface

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**TECHNICAL MEMO**

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water monitoring has been ongoing for the past three years at points along Bear Canyon Road. These points will continue to be monitored in accordance with the MRP when flow is available.

**Potential impacts to the hydrologic balance**

The application meets the hydrology Environmental Description requirements for potential impacts to the hydrologic balance as provided in R645-301-728.310. Page 7-1b of the application states that little to no impacts to the hydrologic balance are anticipated due to 1) groundwater systems in the Blackhawk Formation occur in hydraulically isolated groundwater partitions that are not in hydraulic communication with adjacent groundwater partitions, which limits the amount of groundwater that could potentially be drained 2) the GVH project area is located near the up-dip ends of the Castlegate Sandstone which limits groundwater recharge potential and the potential for the interception of regional groundwater flow systems and, 3) the Blackhawk formation underlying the GVH project area was likely highly fractured due to the mine workings below and any subsequent groundwater partitions lying beneath the area were drained. Therefore, the likelihood of encountering groundwater and any potential detrimental effects to groundwater from GVH drilling activities is considered low 4) any groundwater encountered during the drilling and construction of the well will be isolated from the surface by approximately 200 feet and therefore any discharge to the surface affecting drainages in the area is considered unlikely. The Permittee has indicated that during the advancement and operation of previous gob gas vent holes, minimal amounts of ground water were encountered. Baseline data provided in the MRP supports this assertion.

**Acid or Toxic Forming Materials**

The application states on page 7-12f that no acid or toxic forming materials have been identified in the soils or strata of the West Ridge Mine permit area that could impact surface or groundwater resources in the permit area or surrounding vicinity.

**Sediment Yield**

The application meets the hydrology Environmental Description requirements for sediment yield impacts as provided in R645-301-728.331.

Page 7-1 thru 7-1b of the application provides a discussion as to the various sediment control methods to be utilized in the GVH project area. Upon construction of the well pad and the installation of the methane degasification units, the operator plans to excavate into the slope that exists along the south side of Bear Canyon Road. Once the rock and topsoil are removed from the cut slope and the topsoil is transferred to the designated topsoil storage pile, the operator intends to construct a ditch along the toe of the cut slope to create a drainage channel. The drainage ditch will be graveled for its entire length from the crossing of the ephemeral

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**TECHNICAL MEMO**

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channel up to the end of the road. Interim reclamation of the cut slopes is planned immediately after excavation via pocking and reseeding techniques with layers of wood straw placed on the slope to encourage seed germination. Sediment control methods were discussed in the field between Division staff and the mine operator met to discuss the project on an October 16, 2008 field visit. The operator agreed to alternate sediment control measures due to the limited space available in the GVH project area: line the entire ditch with riprap, gravel the entire GVH project area once construction is complete, and place excelsior logs along the drainage channel at 50-foot intervals in order to reduce the flow of sediment along the length of the channel. The drainage channel's ultimate discharge will be the natural ephemeral channel that crosses the road near the southwestern edge of the GVH project area.

**Water Quality**

The application meets the requirements of R645-301-728.332. On pages 7-12d – 7-12e of the application, the Permittee discusses the potential for water quality impacts as a result of the proposed construction and operation of the GVH project area. Due to the sediment control structures to be installed during the construction and operational phase of the degas wells, the potential for an increase in total suspended solids to the receiving drainages will be minimized. The soil samples obtained and analyzed for the proposed project are presented in Attachment 2-1. Soil data from a recent soil survey of the GVH project area conducted on October 7, 2008 was not available to the Division at the time this memo was written.

The volume of topsoil to be excavated for the GVH project area does not appear likely to affect water quality in the area for the following reasons: 1) a portion of the top soil is planned to be used for constructing the well pad. The soil will be used as fill and compacted to make the well pad. 2) Remaining topsoil is to be transported to an area adjacent to Bear Canyon Road approximately 3,300 feet from the GVH project area where the topsoil will be surrounded by an earthen berm, labeled and secured around the perimeter with excelsior logs to prevent erosion.

**Ground-water and surface-water availability**

The application meets the hydrology Environmental Description requirements for ground water and surface-water availability as provided in R645-301-728.334. As outlined in the baseline information provided in the MRP, little ground water is located in the area of the proposed degas wells. If ground water is encountered during drilling, the ground water aquifers will be sealed using drilling mud. Upon the completion of the degas well, the casing will be grouted and cement will be placed inside the well casing during reclamation. The grouting of the casing inside the well hole will effectively prevent ground water from entering into the degas wells. In order for the degas wells to function properly, any encountered ground water must be prevented from entering the well.

**TECHNICAL MEMO**

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The degas wells have little potential to impact any spring or discharges to the ephemeral drainage channel located adjacent to Bear Canyon Road. Any encounters with groundwater during drilling will be at depth and therefore unlikely to affect any surface water drainage. The wells are not designed to capture water, dewater aquifers, or cause subsidence. In addition, no appreciable alluvial groundwater systems were identified near the GVH project area.

**Groundwater Monitoring Plan**

Additional groundwater monitoring is not necessary in connection with the construction of the GVH wells. The baseline data collected for the approved MRP as well as the ongoing groundwater monitoring is sufficient to meet the groundwater monitoring plan requirements for this project. Maps 7-6 and 7-7 within the approved MRP show past and current monitoring point locations where baseline information has been obtained and where ongoing groundwater monitoring continues in association with the mining activity. The operational groundwater-monitoring plan has been designed to detect impacts to groundwater resources from mining activity. As such, additional monitoring is not necessary.

**Surface-Water Monitoring Plan**

Additional surface water monitoring is not necessary in connection with the construction of GVH wells. The baseline data collected for the approved MRP as well as the ongoing groundwater monitoring is sufficient to meet the surface-water monitoring plan requirements for this project. Map 7-5 Seep and Spring Survey shows the locations of the springs and seeps in the vicinity. The operational surface water-monitoring plan has been designed to detect impacts to surface water resources from mining activity. As such, additional monitoring is not necessary.

**Findings:**

The hydrologic information provided meets the requirements of R645-301-728-Probable Hydrologic Consequences regulations.

**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.

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**TECHNICAL MEMO**

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**Analysis:**

**Monitoring and Sampling Location Maps**

The application meets the requirements for Monitoring and Sampling Location Maps. As previously discussed, Map 7-7 Operational Monitoring Locations included in the application, has been updated to depict the additional surface water monitoring locations ST-11 and ST-13 which are monitored on a monthly basis when the ephemeral drainage along Bear Canyon Road contains surface water.

**Subsurface Water Resource Maps**

Plate 7-6 (Hydrologic Monitoring Map) of the approved MRP depicts the subsurface water resources in the vicinity of the proposed GVH project site.

**Surface Water Resource Maps**

Plate 7-5 (Spring and Seep Survey) and 7-7 (Operational Monitoring Locations) of the approved MRP depicts the surface water resources in the vicinity of the proposed GVH project site.

**Well Maps**

Map 7-7 Operational Monitoring Locations included in the application depicts the locations of the monitoring wells within the permit area. No monitoring wells are located in Bear Canyon.

**Findings:**

Maps, Plans and Cross Sections of Resource Information [R645-301-722 and R645-301-731]: The hydrologic information provided meets the Maps, Plans and Cross Sections of Resource Information requirements as provided in R645-301-722 and R645-301-731.

**TECHNICAL MEMO**

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## **OPERATION PLAN**

### **ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES**

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

#### **Analysis:**

##### **Plans and Drawings**

The application meets the Plans and Drawings requirements for road systems. Attachment 5-14 in the application presents a typical road cross-section plan for the GVH project area. The cross section clearly shows that the existing road slopes 8-11% towards the southwest. A drainage ditch constructed at the toe of the cut slope will flow paralleling Bear Canyon Road and ultimately discharge into the ephemeral drainage channel that crosses the road approximately 45 feet to the southwest of the GVH project southwestern most cut slope area boundary.

The Permittee provides a Pre-Existing Site drawing of the GVH project area showing the existing Bear Canyon Road with the original contours of the slope to the south in Attachment 5-14. A second drawing Bear Canyon GVH Facility Site Plan is also included and depicts the proposed GVH project area that is to be disturbed. The boundaries of the cut slope are shown removing approximately 35 feet of material to accommodate the wells and methane degas units. In addition, a Cut Slope Excavation drawing is included showing the volumes of material to be removed from the slope along several sections of the disturbed area. The drawing also shows the slope ratios relative to the road.

Attachment 3 in the application provides the location of the topsoil staging area. A cross section of the proposed stockpile is shown on the drawing and depicts the height and slope of the stockpile as well as the containment berm. The footprint of the topsoil stockpile is estimated to be 4,000 square feet.

##### **Performance Standards**

The application meets the requirements for Performance Standards of Road Systems and Other Transportation Facilities as provided under R645-301-741 and -742.400.

The proposed drainage system will utilize alternate sediment control methods due to the limited surface area available for the GVH project. Due to the narrow canyon, the pad areas will be constructed by cutting into the hillside on the south side of Bear Canyon Road. Runoff from

**TECHNICAL MEMO**

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the pad areas will divert to a constructed drainage channel approximately 12 inches deep that will be lined with riprap. Excelsior logs are to be placed along the drainage channel every 50 feet to minimize flow and control erosion along the channel. In each instance, the performance standards were either met or exceeded per R645-301-742.333 (Diversion of Miscellaneous Flows) and R645-301-742.423.1 (Road Drainage). Both of the aforementioned regulations call for the use of a 10-year 6-hour event in determining proper sizing and design of various drainage system components.

Attachment 7-12 in the application provides the hydrologic calculations utilized in designing the proposed road drainage system and sediment control systems for the well pads, soil stockpiles and access road. The Permittee utilized the software Storm Version 6.20 for calculating peak flows and stages in each culvert and ditch to be utilized in the projects drainage system. The software based its calculations off of a 10-year 24-hour precipitation event. Attachment 7-12 provides the data utilized for the calculations. Based on the calculations for peak flow runoff conditions, the channel constructed along the top of the cut slope will be 12 inches in depth and riprap lining the ditch with a minimum 6" in depth. In addition, the Permittee provided maps of the undisturbed drainage area within Bear Canyon. Figure 2 depicts the drainage plan once construction is underway showing the cut slope areas with the methane degasification units relative to the drainage channel to be constructed. A cross section of the drainage channel is also provided in Figure 3.

Page 15 in Chapter 7 of the application discusses a maintenance plan to be implemented for sediment control structures that will be implemented in the GVH project area. The Permittee states, "The installation, consisting of four closely-spaced rows of excelsior logs will serve primarily sediment traps, rather than energy dissipaters. This set will be located conveniently close to the road to facilitate regular cleaning and maintenance." The application states that the sediment traps will be inspected and cleaned routinely by mine personnel.

**Findings:**

The application meets the Performance Standards as provided under R645-301-750.

**SPOIL AND WASTE MATERIALS**

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

**TECHNICAL MEMO**

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**Disposal Of Noncoal Mine Wastes**

**Analysis:**

The application addresses the storage and use of hydrocarbon products at the well sites during and after drilling activities. The Permittee addresses a plan to contain and mitigate any fuels, greases and other oils spills or leaks via the use of absorbent materials for the collection of leaked that may be spilled during the installation of the vent holes. The Permittee discusses the proper disposal of absorbent materials, drill cuttings and other materials at an appropriate disposal facility.

**Findings:**

Noncoal Mine Wastes [R645-301-747]: The hydrologic information provided meets the requirements of the Noncoal Mine Waste regulations.

**TECHNICAL MEMO**

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## **RECLAMATION PLAN**

### **GENERAL REQUIREMENTS**

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

#### **Analysis:**

According to the information presented in the application, the GVH well site will remain in operation for the remaining life of the mine. The reclamation plan presented in Appendix 5-14 of the application states that interim reclamation of the cut slopes shall occur during the construction phase of the GVH well installation process. The slopes will be seeded and stabilized with wood straw at that time to encourage vegetation to take hold and therefore minimize erosion. The cut and fill slopes will be revegetated according to the same existing approved plan for the mine in the MRP as specified in R645-301-341. Upon the termination of degasification efforts, the gob vent wells will be sealed in accordance with Federal Regulations 43 CFR CH. 11, Subpart 3484, (3) per a decision by the BLM and the Division.

#### **Findings:**

General Requirements for Reclamation Plan R645-301-761]: The hydrologic information provided meets the General Requirements for Reclamation Plan.

### **APPROXIMATE ORIGINAL CONTOUR RESTORATION**

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

#### **Analysis:**

The proposed cut slope and drill pad area will be returned to their approximate original contour during reclamation as detailed in Attachment 5-14 of the application. Cross sections presented in a map titled: "Reclamation Plan with Backfill Volumes" is presented in Attachment 5-14 of the application. The cross sections on the map present various individual cross sections along that cut slope and how each area will be backfilled to its approximate original contour.

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**TECHNICAL MEMO**

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The application addresses how the created drainage channel will be restored during reclamation. The application addresses how the sediment control and/or siltation structures are to used and later removed during the reclamation phase of the project.

The application states on page 7-1b of Chapter 7 that prior to final reclamation all drill holes will be plugged and sealed in accordance with State and Federal regulations and in accordance with R645-301-765.

**Findings:**

Siltation Structures and Structure Removal [R645-301-763&764]: The hydrologic information provided meets the Approximate Original Contour requirements as provided in R645-301-764.

## **CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT**

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

**Analysis:**

No additional impacts are expected from the construction of GVH project area.

**Findings:**

The hydrologic information provided meets the Cumulative Hydrologic Impact Assessment requirements as provided in R645-301-730.

**RECOMMENDATIONS:**

The hydrologic information provided in the application meets the requirements of the State of Utah R645-Coal Mining Rules. The proposed amendment should be approved at this time.