

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

June 21, 2006

TO: Internal File

THRU: Wayne Hedberg, Permit Supervisor  
Peter H. Hess, Environmental Scientist III/Engineering, Team Lead

FROM: Steve Christensen, Environmental Scientist II/Hydrologist

RE: Degas Wells G-13 thru G-17, Canyon Fuel Company, Dugout Canyon Mine, C/007/0039, Task ID #2456

### **SUMMARY:**

On March 17<sup>th</sup>, 2006, The Division of Oil Gas and Mining (the Division) received an application to permit the installation of degas wells G-13 through G-17. The project would add degas these wells to the series of degas wells already approved by the Division (G-1 through G-12). Task ID #2456 has been assigned to this review for purposes of tracking.

The hydrologic information provided in the application does not meet the requirements of the State of Utah R645-Coal Mining Rules. The application should not be approved until the following deficiencies are addressed:

**R645-301-728.310:** The Permittee needs to include findings as to whether adverse impacts may occur to the hydrologic balance due to the installation of the gob gas vent holes or provide a reference as to where that information can be found in either the Methane Degasification Amendment or the approved MRP.

**R645-301-728.331:** The Permittee needs to address what probable hydrologic consequences related to sediment yield may result from the gob vent hole installations or provide a reference to where that information can be found in either the Methane Degasification Amendment or the approved MRP.

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**R645-301-728.334:** The application does not adequately address potential ground and surface water availability issues that could arise in connection with the gob gas vent hole construction. On page 7-5, the application states, “during drilling of the wells, the groundwater encountered will be affected.” The application does not expand on how the groundwater may be affected. The Permittee should address what affects the gob vent hole construction may have on ground-water and surface-water availability or provide a reference to where that information can be found in either the Methane Degasification Amendment or the approved MRP.

**R645-301-731, R645-301-732 and R645-301-742.400:** The Permittee needs to provide drawings for the proposed access roads. The drawings should reflect the elements of the design: drainage designs, erosion/sediment controls, proximity to stream channels, physical dimensions, slopes, etc.

**R645-301-731, R645-301-732 and R645-301-742.400:** The Permittee should clarify which gob vent holes will require new access road construction as well as provide a written description as to the road construction itself: amount of disturbance, drainage designs, erosion/sediment controls, proximity to stream channels, physical dimensions, slopes, etc.

**R645-301-731.600:** The Permittee should identify which of the intermittent drainages directly adjacent to the proposed gob vent sites are within 100 feet and commit to maintaining a stream buffer zone in those instances.

**R645-301-742:** The Permittee needs to provide the Division with a description of the sediment controls that will be utilized in connection with the access road construction.

**R645-301-742.212:** The Permittee should include language in the application that provides for the installation of the siltation structures prior to beginning construction of the drill pads and access roads as required.

**TECHNICAL ANALYSIS:**

**ENVIRONMENTAL RESOURCE INFORMATION**

## **GENERAL**

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

### **Analysis:**

Beginning on page 7-1 of the Methane Degasification Amendment, references are provided to various sections of the approved MRP that describe the hydrological resources in the gob vent hole project area.

### **Findings:**

The hydrologic information provided meets the requirements of R645-301-721-Environmental Description.

## **CLIMATOLOGICAL RESOURCE INFORMATION**

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

### **Analysis:**

The application meets the hydrology requirements for Climatological Resource Information. Page 7-4 of the application provides a reference to Appendix 4-1 of the approved MRP and RA Attachment 7-5 of the Refuse Pile Amendment where the climatological data is located.

### **Findings:**

The hydrologic information provided meets 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.

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### **Analysis:**

Geologic information related to the well sites and adjacent areas are presented in Chapter 6 of the Methane Degasification Amendment Wells G-1 Thru G-17 as well as in Chapter 6 of the approved MRP.

### **Findings:**

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

## **HYDROLOGIC RESOURCE INFORMATION**

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

### **Analysis:**

#### **Sampling and Analysis**

The application provides a reference to Section 723 of the approved MRP in 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 Section 724 of the approved MRP. Section 724 of the approved MRP provides baseline information for the proposed gob vent hole installations.

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

The application states that the cumulative impact are (CIA) currently in place for the Dugout Canyon Mine covers the proposed gob vent hole locations and that the information required for the Division to develop a Cumulative Hydrologic Impact Assessment (CHIA) is presented in the approved MRP. Section 725 of the approved MRP states that chapters 6 and 7 (of approved MRP) provide the hydrologic and geologic information required by the Division to develop a CHIA.

### **Modeling**

No groundwater monitoring was conducted in preparation for the gob vent hole installations.

### **Probable Hydrologic Consequences Determination**

The application does not meet the hydrology Environmental Description for Probable Hydrologic Consequences (PHC) as provided in R645-301-728.

### **Potential impacts to the hydrologic balance**

The application does not adequately identify potential adverse impacts to the hydrologic balance as required in R645-301-728.310. The application refers to “subsections of this submittal and the approved M&RP” for the hydrologic balance information. However, the subsections of this submittal, the Methane Degasification Amendment, as well as the approved MRP, do not address how the proposed gob vent hole installations could affect the relationship between the quality and quantity of water inflow to, water outflow from and water storage in a hydrologic unit as ‘hydrologic balance’ is defined in R645-301-100.

### **Acid or Toxic Forming Materials**

The application states that no acid or toxic forming materials have been identified in the soils or strata of the Dugout Canyon Mine. The application references Appendix 6-2 of the approved MRP that outlines the finding that the Dugout Canyon Mine area does not contain potentially acid forming or toxic material. The application also references Chapter 6, Section 623 of the Methane Degasification Amendment, which states, “no acid or toxic forming materials will originate at the well sites.”

### *Sediment Yield*

The application does not adequately address sediment yield from the disturbed area as a result of the gob gas vent hole installations. It is the understanding of the division that newly constructed access roads will be required at several of the vent hole sites. In addition, disturbance attributable to the pad construction is, in some cases, well over two acres as shown in Table 1-2 of the application (example: G-13 is listed as producing 2.75 acres of disturbance). The Permittee should address what probable hydrologic consequences related to sediment yield may result from the gob vent hole installations or provide a reference to the MRP that discusses this potential impact.

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

The application does not adequately address potential ground and surface water availability issues that could arise in connection with the gob gas vent hole construction. On page 7-5, the application states, “during drilling of the wells, the groundwater encountered will be affected.” The application does not expand on how the groundwater may be affected. The Permittee should address what affects the gob vent hole construction may have on ground-water and surface-water availability.

#### *Potential hydrocarbon contamination*

The application states that no hydrocarbon products will be stored at the well sites. However, the Permittee has stated that absorbent materials will be used for the collection of leaked fuels, greases and other oils that may be spilled during the installation of the vent holes. The saturated absorbent materials would then be disposed of at an appropriate landfill facility.

### **Groundwater Monitoring Plan**

A groundwater monitoring plan specific to the installation of gob gas vent holes G-13 thru G-17 is not necessary. 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. Plate 7-1 of the approved MRP shows the springs and monitoring well locations where baseline information has been obtained and where ongoing groundwater monitoring continues in association with the mining activity.

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

A surface-water monitoring plan specific to the installation of gob gas vent holes G-13 thru G-17 is not necessary. 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. Plate 7-1 of the approved MRP shows the stream locations where baseline information has been obtained and where ongoing groundwater monitoring continues in association with the mining activity.

### **Findings:**

The hydrologic information provided does not meet the requirements of R645-301-728-Probable Hydrologic Consequences regulations. Before the submittal can be approved, the following deficiencies should be addressed:

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**R645-301-728.310:** The Permittee needs to include findings as to whether adverse impacts may occur to the hydrologic balance due to the installation of the gob gas vent holes or provide a reference as to where that information can be found in either the Methane Degasification Amendment or the approved MRP.

**R645-301-728.331:** The Permittee needs to address what probable hydrologic consequences related to sediment yield may result from the gob vent hole installations or provide a reference to where that information can be found in either the Methane Degasification Amendment or the approved MRP.

**R645-301-728.334:** The application does not adequately address potential ground and surface water availability issues that could arise in connection with the gob gas vent hole construction. On page 7-5, the application states, “during drilling of the wells, the groundwater encountered will be affected.” The application does not expand on how the groundwater may be affected. The Permittee should address what affects the gob vent hole construction may have on ground-water and surface-water availability or provide a reference to where that information can be found in either the Methane Degasification Amendment or the approved MRP.

## 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 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the monitoring and sampling locations utilized for baseline data gathering as well as on-going monitoring activities in the area of the proposed gob vent hole sites.

#### Subsurface Water Resource Maps

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the subsurface water resources in the vicinity of the proposed gob vent hole sites.

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### **Surface Water Resource Maps**

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the surface water resources in the vicinity of the proposed gob vent hole sites.

### **Well Maps**

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the location of a single monitoring well located approximately  $\frac{3}{4}$  of a mile west of the proposed gob vent hole sites.

### **Findings:**

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.

## **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 does not meet the requirements for Plans and Drawings of road systems. Attachment 5-1 provides figures of gob vent holes G-13 thru G-17. The figures depict the pre-disturbance and drilling phase land contours as well as the disturbed area boundary and the new access road contours. However, it appears that detailed plans and drawings for the proposed access roads are not contained within the application. The Methane Degasification Amendment provides a typical access road cross section (See Figure 5-14). However, it does not provide sufficient detail. The submitted drawings should reflect the elements of the design. It appears that gob vent hole sites G-13, G-15 and G-16 will require new road construction to access the proposed pad sites.

### **Performance Standards**

The application does not meet the requirements for Performance Standards. The Permittee should clarify which gob vent holes will require new access road construction as well as provide a written description as to the road construction itself as required under R645-301-732 and R645-301-742.400 (drainage designs, erosion/sediment controls, proximity to stream channels, physical dimensions, slopes, etc.).

### **Findings:**

The hydrologic information provided does not meet the requirements of R645-301-732 and R645-742.400. Before the submittal can be approved, the following deficiencies should be addressed:

**R645-301-731, R645-301-732 and R645-301-742.400:** The Permittee needs to provide drawings for the proposed access roads. The drawings should reflect the elements of the design: drainage designs, erosion/sediment controls, proximity to stream channels, physical dimensions, slopes, etc.

**R645-301-731, R645-301-732 and R645-301-742.400:** The Permittee should clarify which gob vent holes will require new access road construction as well as provide a written description as to the road construction itself: amount of disturbance, drainage designs, erosion/sediment controls, proximity to stream channels, physical dimensions, slopes, etc.

## **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.

### **Analysis:**

#### **Disposal Of Noncoal Mine Wastes**

The application states that no hydrocarbon products will be stored at the well sites. However, the Permittee has stated that absorbent materials will be used for the collection of leaked fuels, greases and other oils that may be spilled during the installation of the vent holes. The saturated absorbent materials will then be disposed of at an appropriate landfill facility.

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**Findings:**

The hydrologic information provided meets the Spoil and Waste Materials Operation requirements as provided in R645-301-747.

**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.**

**Analysis:**

**General**

The Hydrologic Information is located in chapter 7 of the application.

**Groundwater Monitoring**

A groundwater monitoring plan specific to the installation of gob gas vent holes G-13 thru G-17 is not necessary. 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. Plate 7-1 of the approved MRP shows the springs and monitoring well locations where baseline information has been obtained and where ongoing groundwater monitoring continues in association with the mining activity.

**Surface Water Monitoring**

A surface-water monitoring plan specific to the installation of gob gas vent holes G-13 thru G-17 is not necessary. 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. Plate 7-1 of the approved MRP shows the stream locations where baseline information has been obtained and where ongoing groundwater monitoring continues in association with the mining activity.

**Acid- and Toxic-Forming Materials and Underground Development Waste**

The application states that no acid or toxic forming materials have been identified in the soils or strata of the Dugout Canyon Mine. The application references Appendix 6-2 of the approved MRP that outlines the finding that the Dugout Canyon Mine area does not contain

potentially acid forming or toxic material. The application also references Chapter 6, Section 623 of the Methane Degasification Amendment, which states, “no acid or toxic forming materials will originate at the well sites.”

### **Diversions: General**

The application states on pages 7-11 and 7-12 that no diversions will be constructed as part of the drilling or operational phases of the project.

### **Stream Buffer Zones**

The application does not adequately address Stream Buffer Zones. The coal mining rules call for no land within 100 feet of a perennial stream or an intermittent stream to be disturbed by coal mining operations. The application states that buffer zones will be established “adjacent to a perennial stream”. The Permittee should identify which of the perennial and/or intermittent drainages directly adjacent to the proposed gob vent sites are within 100 feet and commit to maintaining a stream buffer zone in those instances.

### **Sediment Control Measures**

The application does not provide sufficient detail and explanation as to the sediment controls to be utilized during the construction, operational and reclamation phases for the newly constructed access roads. The Permittee needs to provide the Division with a description of the sediment controls that will be utilized in connection with the access road construction.

The application discusses the sediment control measures to be used for the drilling pads on pages 7-7 and 7-8. The Permittee proposes to retain sediment within the disturbed area of the drilling pad by utilizing silt fences and/or straw bales dikes. During initial drilling, the sites will be graded to ensure that the generated runoff will flow towards the berms surrounding the pad. The berms will direct the runoff to the lowest point(s) within the pad area where a silt fence and/or straw bale dike will then treat the runoff. A berm will be placed at the top of the pad’s cut slopes to divert runoff around the disturbed area. In addition, a berm and silt fence will be installed at the toe of the fill slope.

After drilling operations are completed, the pad will be re-graded to cause the runoff to flow towards a silt fence and/or straw bale dike. (See Attachment 5-1 for pad layout designs). The Permittee has committed to inspection the silt fences and/or bale dikes periodically and removing accumulated sediment as needed to maintain functionality. The sediment removed from the structures will be piled on the pad and be used for fill during final reclamation of the well site.

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The mud pits will be dismantled and filled following the completion of drilling.

**Siltation Structures: General**

The application commits to utilizing berms, silt fences and straw bale dikes to treat runoff. Due to the steepness of the slopes surrounding many of the gob vent hole sites, the Division recommends that Permittee include language in the application that provides for the installation of the siltation structures prior to beginning construction of the drill pads and access roads as required in R645-301-742.212.

**Siltation Structures: Other Treatment Facilities**

The application provides calculations and design considerations for the relative berm heights and silt fence dimensions at each of the gob vent hole sites. The berms were designed by utilizing the Soil Conservation Service (SCS) method for calculating peak flows. The SCS method incorporates generalized loss-rate and runoff relationships developed from watershed studies in the United States. A total runoff volume was calculated for each pad area utilizing a 10-year, 24-hour rainfall event as required by state regulations (Other Treatment Facilities--R645-301-742.230). Berm dimensions were then calculated to contain the design storm event.

In addition, the application provides the calculations utilized in determining the proper silt fence sizing to handle the 10 year 24 hour storm event.

**Impoundments**

On page 7-9 of the application, the Permittee states that no permanent impoundments will be utilized at the site.

**Findings:**

The hydrologic information provided does not meet the requirements for Operational Plan-Hydrologic Information. Before the submittal can be approved, the following deficiencies should be addressed:

**R645-301-731.600:** The Permittee should identify which of the intermittent drainages directly adjacent to the proposed gob vent sites are within 100 feet and commit to maintaining a stream buffer zone in those instances.

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**R645-301-742:** The application does not provide sufficient detail and explanation as to the sediment controls to be utilized during the construction, operational and reclamation phases for the newly constructed access roads. The Permittee needs to provide the Division with a description of how the sediment will be controlled in connection with the access road construction.

**R645-301-742.212:** The Permittee should include language in the application that provides for the installation of the siltation structures prior to beginning construction of the drill pads and access roads as required.

## 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:

#### Monitoring and Sampling Location Maps

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the monitoring and sampling locations utilized for baseline data gathering as well as on-going monitoring activities in the area of the proposed gob vent hole sites.

#### Certification Requirements

A certified professional engineer registered with the state of Utah has stamped the submitted maps, plans and cross sections.

### Findings:

The Operational Plan requirements for Maps, Plans and Cross Sections of Mining Operations are met by the provided hydrologic information.

## 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-

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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:**

The reclamation plan is presented in section 540 of the application. Natural drainage patterns will be restored after degasification is completed. The cut and fill slopes will be reshaped at the well sites. When a siltation structure is removed, the land on which the siltation structure was located will be regarded in accordance with the reclamation plan presented in Section 540. Upon the termination of degasification efforts, the gob vent holes 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:**

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 application states that the well sites will be returned to their approximate original contour after reclamation is completed, with the exception of well sites G-11 and G-12. The Permittee has proposed plans to leave pads G-11 and G-12 in place following the termination of degasification activities. See Attachment 5-1 for design drawings.

### **Findings:**

The hydrologic information provided meets the Approximate Original Contour requirements as provided in R645-301-764.

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

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

### **Analysis:**

### **Reclamation**

The roads that existed prior to the drilling program will be retained after reclamation. The access roads established during the drilling program will be reclaimed after methane extraction has been completed.

### **Findings:**

The hydrologic information meets the Reclamation Plan requirements for Road Systems and Other Transportation Facilities.

## **CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT**

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

### **Analysis:**

The degasification well sites are within the current cumulative impact area. The CHIA will be updated to include the well sites. No additional impacts are expected from construction of the gob vent holes.

### **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 does not meet the requirements of the State of Utah R645-Coal Mining Rules. The proposed amendment should not be approved at this time.