

# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

July 31, 2006

TO: Internal File

THRU: Wayne Hedberg, Permit Supervisor, Task Manager *DWH*  
Peter H. Hess, Environmental Scientist/Engineering, Team Lead *PHH*

FROM: *SKC* Steve K. Christensen, Environmental Scientist/Hydrologist

RE: Degas Wells G-13 thru G-17, Canyon Fuel Company, LLC., Dugout Canyon Mine, C/007/0039, Task ID #2580

## SUMMARY:

On July 17<sup>th</sup>, 2006, the Division of Oil, Gas and Mining (the Division) received Canyon Fuel Company's (the Permittee) revisions to the previously submitted application proposing the installation of degas wells G-13 thru G-17 at the Dugout Canyon Mine site. Task ID #2580 has been assigned to this review for purposes of tracking.

The initial application proposing the installation of degas wells G-13 thru G-17 was submitted to the Division on March 17<sup>th</sup>, 2006 and assigned Task ID #2456. The Division reviewed the submittal and a deficiency letter was sent to the Permittee on June 28<sup>th</sup>, 2006.

The project proposes to add additional degas wells to the Dugout Canyon Mine. Prior to this submittal, the Division had reviewed and approved the installation of degas wells G-1 thru G-12.

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

## TECHNICAL ANALYSIS:

## ENVIRONMENTAL RESOURCE INFORMATION

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### 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.

**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 area (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.

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**Modeling**

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

**Probable Hydrologic Consequences Determination**

The application meets the hydrology Environmental Description requirements for Probable Hydrologic Consequences (PHC) as provided in R645-301-728.300. Page 7-5 thru 7-6 of the application discusses the subsections of the probable hydrologic consequences regulations. The probable hydrologic consequences are further discussed in detail in Section 730 of the MRP.

**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 7-5 of the application states that little to no impacts to the hydrologic balance are anticipated due to 1) the potential impacts are limited to the drilling and construction of the wells; 2) best technology currently available (BTCA) techniques for sediment control will be implemented to minimize the surface disturbance; 3) ground water information provided in the MRP demonstrates that minimal groundwater is located in the area of the proposed degas wells; and 4) any water encountered during the drilling and construction of the well will need to be sealed from the well in order for it to function as an ambient vent of methane gas.

**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 meets the hydrology Environmental Description requirements for sediment yield consequences as provided in R645-301-728.331. Page 2-8 of the application states that erosion control measures will include silt fences, berms, seeding, straw bales, soil roughening, and mulching of the drill pad areas. In addition, the Permittee has committed to using the best technology currently available during the installation of the degas wells. Water bars will be installed on the constructed access roads to minimize sediment transport. As such,

impacts to the hydrologic resources in the area of the degas wells due to sedimentation is expected to be minimal.

### **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. Page 7-6 and 7-7 outlines the potential impacts to ground water and surface water availability. 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 degas wells have little potential to impact or decrease creek flow or spring discharges. The wells are not designed to capture water, dewater aquifers or cause subsidence. No measurable water was encountered during the drilling and construction of degas wells G-1 thru G-9.

### **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

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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 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.

**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.

**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 meets the requirements for Plans and Drawings of road systems as provided in R645-301-732. Attachment 5-1 of the application provides three drawings for each of the proposed drill pad locations. The submitted drawings/plans depict the proposed contours of the drill pads, typical cross-sections as well as pad layouts. The drawings identify the various sediment/erosion control techniques to be implemented at the proposed drill sites including water bars, silt fences and the utilization of a containment berm around the drill pad topsoil stockpile.

Figure 5-14 of the application depicts a typical access road cross-section providing dimensions and approximate slopes.

#### **Performance Standards**

The application meets the requirements for Performance Standards of Road Systems and Other Transportation Facilities as provided under R645-301-732 and R645-301-742.400. Page 5-15 of the application states the roads used to access well sites G-13, G-14, G-15, and G-17 are existing roads. The road to well site G-16 is a pre-existing road; however, it has been reclaimed. The road construction necessary to access G-16 consists of approximately 500' of disturbance along the reclaimed pre-existing road alignment. An average grade of 5% is proposed for G-16's access road, ranging in width from 15 to 20 feet. Topsoil will be stripped from the road alignment and either wind rowed adjacent to the road or stored with the topsoil stockpile adjacent to the drill pad area. The Permittee has committed to installing water bars as needed in order to direct flow off the road. Once the flow is directed off the road, silt fences or straw bales will be utilized to treat the runoff. Page 5-15 of the application provides a commitment to

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reclaim the access roads established during the drilling after methane extraction has been completed.

The Permittee has committed to minimizing the amount of generated sediment, runoff and suspended solids from the well site area and access roads with the utilization of silt fences, berms and straw bale dikes. In addition, the Permittee commits to not performing construction activities during major precipitation events.

The roads to be utilized in accessing G-13, G-14, G-15, and G-17 were constructed and are maintained by the landowner.

**Findings:**

The hydrologic information provided meets the requirements of R645-301-732 and R645-742.400.

**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.

**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, -300-148, -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.

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**Stream Buffer Zones**

The application meets the Operational Plan stream buffer zone requirements as provided in R645-301-731.600. Page 7-9 of the application commits to establishing a stream buffer zone when drilling sites adjacent to a perennial or intermittent stream. Well sites G-11, G-12, and G-15 have been identified as sites requiring stream buffer zone designations.

**Sediment Control Measures**

The application meets the requirements for the Operational Plan Sediment Control Measures to be utilized per R645-301-742. The Permittee has committed to installing water bars as needed in order to direct flow off of access roads. Once the flow is directed off the roads, silt fences or straw bales will be utilized to treat the runoff. Page 5-15 of the application provides a commitment to reclaim the access roads established during the drilling after methane extraction has been completed.

The Permittee has committed to minimizing the amount of generated sediment, runoff and suspended solids from the well site area and access roads with the utilization of silt fences, berms and straw bale dikes. In addition, the Permittee commits to not performing construction activities during major precipitation events.

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 inspecting 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.

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

### **Siltation Structures: General**

The application meets the Operational Plan requirements for Siltation Structures: General as provided in R645-301-742.212. The application commits to utilizing berms, silt fences and straw bale dikes to treat runoff. The Permittee has committed to installing siltation structures prior to beginning construction.

### **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 meets the requirements for Operational Plan-Hydrologic Information.

## **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:**

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**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, -301-626, -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 regraded 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.

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**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 meets the requirements of the State of Utah R645-Coal Mining Rules. The proposed amendment should be approved.