

# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

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August 17, 2007

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TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor *pgl*

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

RE: Revisions to Add Degas Wells G-18, G-31 and AMV Road, Canyon Fuel Company, LLC., Dugout Canyon Mine, C/007/0039, Task ID #2828

## SUMMARY:

On July 25th, 2007, the Division of Oil, Gas and Mining (the Division) received an application from Canyon Fuel Company (the Permittee) for the construction of methane degasification wells G-18, G-31 (degas wells G-18 and G-31) and a 7,155 foot long access road. Task ID #2828 has been assigned to this review for tracking purposes.

The proposed degas wells and access road will provide additional methane venting from the longwall panel GIL-6.

The Permittee has provided the hydrologic calculations and information relative to culvert design and sizing, stockpile runoff volumes, and stockpile runoff containment. However, due to the steepness of the topography in the area of the proposed road alignment and drill pads, additional information is needed in order to determine whether the proposed sediment control measures and road designs are adequate.

The hydrologic information provided in the Methane Degasification Amendment Wells G-18, G-31 and Access Road application (the application) does not meet the requirements of the State of Utah R645-Coal Mining Rules. The application should not be approved at this time.

Prior to approval of the application, the following deficiencies need to be addressed:

**R645-301-728.300-** The PHC Determination (Page 5) of the application should be modified. The Permittee should discuss the potential for hydrologic consequences as a result of increased sediment yield from the proposed disturbed areas. Discussion should include a description of the sediment control techniques to be implemented during the operational and reclamation phases of the proposed access road and degas wells.

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TECHNICAL MEMO

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The application should include some discussion as to the location of the access road relative to potentially impacted drainages. The application outlines the installation of culverts in five drainages intersected by the proposed construction. Due to the steepness of the topography and resulting flow velocities and volumes to be encountered at the sites, the Division finds that the application has not provided enough information as to the flow characteristics of the potentially impacted drainages.

**R645-301-728.332-** The Permittee should discuss the potential for water quality impacts to the receiving drainages as a result of the project. The discussion should address impacts to acidity as well as total suspended and dissolved solids (TSS and TDS).

**R645-301-521.170, R645-301-527.200 and R645-301-527.210-** requires a detailed description of each road to be constructed used or maintained within the proposed permit area. The Permittee's description should include a map, appropriate cross sections, and the following: specifications for each "road width, road gradient, road surface, road cut, fill embankment, culvert, bridge, and *drainage ditch* and *drainage structure*". In light of the steep topographic conditions that will be encountered, the application needs to provide additional design drawings and plan details that depict the hydraulic/hydrologic structures to be constructed.

The design drawings/plans should include: inlet/outlet protection for the culverts, culvert specifications and plan drawings, water bar design drawings and specifications as well as any other plans/drawings for the sediment control techniques to be utilized (i.e. silt fence, straw bales etc.).

**R645-301-741-** requires each permit application to include site-specific plans for drainage control from both the disturbed and undisturbed areas.

The Permittee should provide a written description outlining the components and design considerations for controlling the drainage from the disturbed areas. The description should include a discussion for the construction phase as well as the reclamation phase for the proposed degas wells and access road. In addition, the Permittee should provide justification that their proposed designs will provide adequate drainage control as outlined by the regulations.

Plate 1 of Attachment 5-4 depicts the locations of the water bars and indicates that they will be placed at "appropriate locations". The Permittee should provide further discussion as to what factors and conditions will be taken into account in determining water bar placement (i.e. slope, flow lengths, velocities etc).

**R645-301-742.411-** outlines the requirement that "the design and construction or reconstruction of roads will incorporate appropriate limits for surface drainage control, culvert placement, culvert size and any necessary design criteria established by the Division". The Permittee must provide a narrative description and justification as to how the use of water bars

**TECHNICAL MEMO**

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and berms will provide adequate surface drainage control for the road. Attachment 5-4 provides runoff and containment calculations for the berms to be utilized in for the soil stockpiles, but there is no discussion and/or calculations provided for the berms to be utilized on the access road. The Permittee should demonstrate the ability of the access road berms to adequately contain the design storm event of a 10 year 24 hour event (as utilized in the culvert sizing calculations). The Permittee should demonstrate that the berms and water bars will minimize sedimentation over the out slopes of the degas well pads and access road.

The Permittee should also provide a brief discussion within the text of the application that explains the methods utilized in sizing the culverts and provide justification that they will safely pass the design storm event.

**R645-301-527.230 and 527.240-** require the Permittee to provide a maintenance plan describing how the roads will be maintained throughout their life to meet the design standards as well as a commitment that if a road is damaged by a catastrophic event, such as a flood or earthquake, the road will be repaired as soon as practical after the damage has occurred. The Permittee should provide the information and subsequent commitment to maintain the road as described above.

**R645-301-742.300-** The Permittee should provide information (both written as well as the correlating plan drawings) that demonstrate the proposed diversions of five drainages will be designed, located, constructed maintained and used to: be stable and prevent, to the extent possible, additional contributions of suspended solids. A figure provided in Attachment 5-4 depicts 5 watersheds that will necessitate the placement of culverts within their respective drainages. Installing a culvert is considered a Diversion per R645-State of Utah Coal Mining Rules. The Permittee must provide discussion as to how the proposed access road's design and culvert installations will not impact these drainages.

**R645-301-731.600-** The Permittee should provide a discussion as to whether the stream buffer zone requirements apply to the affected drainages. In the event that a 100' buffer zone is required yet located in areas impractical or impossible to establish, the Permittee should provide the Division with a commitment to establish buffer zone markers where possible as provided for in R645-301-521.261.

**R645-301-741-** requires site-specific plans that describe the plans and techniques to be utilized for the control of drainage from disturbed and undisturbed areas. The Permittee should provide a detailed description (written narrative with references to design drawings and plans) of the sediment control techniques to be implemented during the operational and reclamation phases of the proposed access road and degas well.

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**TECHNICAL MEMO**

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The Permittee should also provide justification and evidence that the proposed sediment control measures will be effective in controlling sediment removal from the disturbed areas. The discussion should take into account the maintenance of the proposed sediment control structures.

**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. Beginning on page 7-1 of the application, the Permittee provides references to the sections of the approved MRP that describe the hydrological resources in the gob vent hole project area. Figure 7-1 of the MRP shows a generalized hydrostratigraphic cross section of the permit area as well as the proposed well site. Plate 7-2 of the MRP depicts the locations of surface-water bodies and existing or pending water rights. In addition section 724 of the MRP provides baseline information for the permit area including the proposed degas well site.

**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 as provided in R645-301-724. 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 climatological data is provided.

**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 degas wells G-18, G-31 and the proposed access road is presented in Chapter 6 of the application 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**

Page 7-3 of 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 permit area (including the proposed sites for gob gas vent holes G-18, G-31 and the proposed access road).

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**TECHNICAL MEMO**

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**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 Dugout Canyon Mine covers the proposed gob vent hole locations and the information required for the Division to develop a Cumulative Hydrologic Impact Assessment (CHIA) is presented in the approved MRP. In Section 725 on page 7-4 of the application, chapters 6 and 7 (of approved MRP) are referenced. Chapters 6 and 7 of the MRP provide the hydrologic and geologic information required by the Division to develop a CHIA.

**Modeling**

The application meets the Environmental Description requirements for 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. Appendix 7-3, Section 3 contains a Mayo and Associates PHC report that provides hydrologic information for the permit and adjacent area (including the G-18, G-31 and proposed access road locations).

**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 7-6 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. The Permittee has indicated that during the advancement and operation of the seventeen 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 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 meet the hydrology Environmental Description requirements for sediment yield impacts as provided in R645-301-728.331.

**R645-301-728.300-** The PHC Determination (Page 5) of the application should be modified. The Permittee should discuss the potential for hydrologic consequences as a result of increased sediment yield from the proposed disturbed areas. Discussion should include a description of the sediment control techniques to be implemented during the operational and reclamation phases of the proposed access road and degas wells.

The application should include some discussion as to the location of the access road relative to potentially impacted drainages. The application outlines the installation of culverts in five drainages intersected by the proposed construction. Due to the steepness of the topography and resulting flow velocities and volumes to be encountered at the sites, the Division finds that the application has not provided enough information as to flow characteristics of the potentially impacted drainages.

### **Water Quality**

The application does not meet the requirements of R645-301-728.332.

**R645-301-728.332-** The Permittee should discuss the potential for water quality impacts to the receiving drainages as a result of the project. The discussion should address impacts to acidity as well as total suspended and dissolved solids (TSS and TDS).

### **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

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**TECHNICAL MEMO**

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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. In addition, 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**

Additional groundwater monitoring is not necessary in connection with the construction of gob gas vent holes G-18, G-31 and the access road construction. 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. 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 gob gas vent holes G-18, G-31 and the access road construction. 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. 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 does not meet the requirements of R645-301-728-Probable Hydrologic Consequences regulations. The following deficiencies should be addressed prior to Division approval:

**R645-301-728.300-** The PHC Determination (Page 5) of the application should be modified. The Permittee should discuss the potential for hydrologic consequences as a result of increased sediment yield from the proposed disturbed areas. Discussion should include a description of the sediment control techniques to be implemented during the operational and reclamation phases of the proposed access road and degas wells.

The application should include some discussion as to the location of the access road relative to potentially impacted drainages. The application outlines the installation of culverts in five drainages intersected by the proposed construction. Due to the steepness of the topography and resulting flow velocities and volumes to be encountered at the sites, the Division finds that the application has not provided enough information as to flow characteristics of the potentially impacted drainages.

**R645-301-728.332-** The Permittee should discuss the potential for water quality impacts to the receiving drainages as a result of the project. The discussion should address impacts to acidity as well as total suspended and dissolved solids (TSS and TDS).

**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 site.

**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 site.

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**TECHNICAL MEMO**

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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 site.

**Well Maps**

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the locations of the monitoring wells within the permit area. Monitoring well GW-19-1 is located approximately  $\frac{1}{2}$  to  $\frac{3}{4}$  of a mile west of the proposed gob gas vent hole site for G-19.

**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 Plans and Drawings requirements for road systems. The Permittee has proposed constructing an access road to be utilized for the construction and operation of degas wells G-18 and G-31. According to Attachment 5-4, the proposed road will be 7,155 feet long (approximately 1.35 acres). Attachment 5-4 of the application contains design information for the proposed access road including: culvert design and sizing information, watershed slope calculations and a figure depicting 5 watersheds that intersect the disturbance associated with G-18, G-31 and the access road. In addition, Figure 1 of Attachment 5-4 depicts a typical road cross section. The cross section depicts the dimensions of the road prism to be constructed. The road width is depicted as approximately 16' with 1 to 1 and 1 to 0.5 slopes depicted on the cut bank of the proposed access road.

The Permittee must provide additional information relative to the construction of the 1.35-mile access road. The application and Attachment 5-4 do not provide the level of detail and

**TECHNICAL MEMO**

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information that is needed in order for the Division to make a finding that the proposed access road has met the requirements of the R645-State of Utah Coal Mining Rules. The following provides a discussion as to the outstanding hydrological information identified by the Division and the regulatory citation that requires it. It should be noted that the following regulatory citations are applicable to all roads (i.e. primary and ancillary).

**R645-301-521.170, R645-301-527.200 and R645-301-527.210** requires a detailed description of each road to be constructed used or maintained within the proposed permit area. The Permittee's description should include a map, appropriate cross sections, and the following: specifications for each "road width, road gradient, road surface, road cut, fill embankment, culvert, bridge, and *drainage ditch* and *drainage structure*". In light of the steep topographic conditions that will be encountered, the application needs to provide additional design drawings and plan details that depict the hydraulic/hydrologic structures to be constructed.

The design drawings/plans should include: inlet/outlet protection for the culverts, culvert specifications and plan drawings, water bar design drawings and specifications as well as any other plans/drawings for the sediment control techniques to be utilized (i.e. silt fence, straw bales etc.).

**Performance Standards**

The application does not meet the requirements for Performance Standards of Road Systems and Other Transportation Facilities as provided under R645-301-741 and -742.400.

**R645-301-527.230 and 527.240-** require the Permittee to provide a maintenance plan describing how the roads will be maintained throughout their life to meet the design standards as well as a commitment that if a road is damaged by a catastrophic event, such as a flood or earthquake, the road will be repaired as soon as practical after the damage has occurred. The Permittee should provide the information and subsequent commitment to maintain the road as described above.

**R645-301-741** requires each permit application to include site-specific plans for drainage control from both the disturbed and undisturbed areas.

The Permittee should provide a written description outlining the components and design considerations for controlling the drainage from the disturbed areas. The description should include a discussion for the construction phase as well as the reclamation phase for the proposed degas wells and access road. In addition, the Permittee should provide justification that their proposed designs will provide for adequate drainage control as outlined by the regulations.

Plate 1 of Attachment 5-4 depicts the locations of the water bars and indicates that they will be placed at "appropriate locations". The Permittee should provide further discussion as to

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TECHNICAL MEMO

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what factors and conditions will be taken into account in determining water bar placement (i.e. slope, flow lengths, velocities etc).

**R645-301-742.411**- outlines the requirement that “the design and construction or reconstruction of roads will incorporate appropriate limits for surface drainage control, culvert placement, culvert size and any necessary design criteria established by the Division”. The Permittee must provide a narrative description and justification as to how the use of water bars and berms will provide adequate surface drainage control for the road. Attachment 5-4 provides runoff and containment calculations for the berms to be utilized in for the soil stockpiles, but there is no discussion and/or calculations provided for the berms to be utilized on the access road. The Permittee should demonstrate the ability of the access road berms to adequately contain the design storm event of a 10 year 24 hour event (as utilized in the culvert sizing calculations). The Permittee should demonstrate that the berms and water bars will minimize sedimentation over the outslopes of the degas well pads and access road.

The Permittee should also provide a brief discussion within the text of the application that explains the methods utilized in sizing the culverts and provide justification that they will safely pass the design storm event.

**Findings:**

The hydrologic information provided does not meet the requirements of the R645-State of Utah Coal Mining Rules. The following deficiencies need to be addressed by the Permittee before final approval of the application:

**R645-301-521.170, R645-301-527.200 and R645-301-527.210** requires a detailed description of each road to be constructed used or maintained within the proposed permit area. The Permittee’s description should include a map, appropriate cross sections, and the following: specifications for each “road width, road gradient, road surface, road cut, fill embankment, *culvert*, bridge, and *drainage ditch* and *drainage structure*”. In light of the steep topographic conditions that will be encountered, the application needs to provide additional design drawings and plan details that depict the hydraulic/hydrologic structures to be constructed.

The design drawings/plans should include: inlet/outlet protection for the culverts, culvert specifications and plan drawings, water bar design drawings and specifications as well as any other plans/drawings for the sediment control techniques to be utilized (i.e. silt fence, straw bales etc.).

**R645-301-741** requires each permit application to include site-specific plans for drainage control from both the disturbed and undisturbed areas.

## TECHNICAL MEMO

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The Permittee should provide a written description outlining the components and design considerations for controlling the drainage from the disturbed areas. The description should include a discussion for the construction phase as well as the reclamation phase for the proposed degas wells and access road. In addition, the Permittee should provide justification that their proposed designs will provide for adequate drainage control as outlined by the regulations.

Plate 1 of Attachment 5-4 depicts the locations of the water bars and indicates that they will be placed at "appropriate locations". The Permittee should provide further discussion as to what factors and conditions will be taken into account in determining water bar placement (i.e. slope, flow lengths, velocities etc).

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The Permittee should also provide a brief discussion within the text of the application that explains the methods utilized in sizing the culverts and provide justification that they will safely pass the design storm event.

**R645-301-527.230 and 527.240-** require the Permittee to provide a maintenance plan describing how the roads will be maintained throughout their life to meet the design standards as well as a commitment that if a road is damaged by a catastrophic event, such as a flood or earthquake, the road will be repaired as soon as practical after the damage has occurred. The Permittee should provide the information and subsequent commitment to maintain the road as described above.

## 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:

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**TECHNICAL MEMO**

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**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, -300-147, -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 application meets the requirements for General Hydrologic information as required by R645-301-731. The Hydrologic Information is presented in chapter 7 of the application. The application discusses the potential impacts to hydrologic resources, provides the design criteria and hydrologic designs utilized at the degas site and also provides the applicable hydrologic performance standards for the drainage features at the degas sites.

**Groundwater Monitoring**

A groundwater-monitoring plan specific to the installation of gob gas vent hole G-19 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 hole G-19 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 does not meet the Diversions: General requirements as outlined in the R645-State of Utah Coal Mining Rules. Page 7-9 of the application states, "No stream channel diversions are planned at the well sites". Page 7-13 states, "No diversions will be constructed as part of the drilling or operational phases of the project". However, the application clearly demonstrates that a total of 5 culverts (ranging in size from 18"-36") will be utilized in connection with this project. Culverts are considered 'diversions' as outlined in the regulations.

**R645-301-742.300-** The Permittee should provide information (both written as well as the correlating plan drawings) that demonstrate the proposed diversions of five drainages will be designed, located, constructed maintained and used to: be stable and prevent, to the extent possible, additional contributions of suspended solids. A figure provided in Attachment 5-4 depicts 5 watersheds that will necessitate the placement of culverts within their respective drainages. Installing a culvert is considered a Diversion per R645-State of Utah Coal Mining Rules. The Permittee must provide discussion as to how the proposed access road's design and culvert installations will not impact these drainages.

#### **Stream Buffer Zones**

The application does not meet the Operational Plan stream buffer zone requirements as provided in R645-301-731.600. R645-301-731.600 prohibits surface disturbance within 100 feet of a perennial or intermittent stream, unless authorized by the Division.

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**TECHNICAL MEMO**

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**R645-301-731.600-** The Permittee should provide a discussion as to whether the stream buffer zone requirements apply to the affected drainages. In the event that a 100' buffer zone is required yet located in areas impractical or impossible to establish, the Permittee should provide the Division with a commitment to establish buffer zone markers where possible as provided for in R645-301-521.261.

**Sediment Control Measures**

The application does not meet the requirements for the Operational Plan Sediment Control Measures to be utilized per R645-301-741 and R645-301-742.411.

**R645-301-741-** requires site-specific plans that describe the plans and techniques to be utilized for the control of drainage from disturbed and undisturbed areas. The Permittee should provide a detailed description (written narrative with references to design drawings and plans) of the sediment control techniques to be implemented during the operational and reclamation phases of the proposed access road and degas well.

The Permittee should also provide justification and evidence that the proposed sediment control measures will be effective in controlling sediment removal from the disturbed areas. The discussion should take into account the maintenance of the proposed sediment control structures.

**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 for three areas of the pad: the pad stockpile, the upper road stockpile and the lower road stockpile. 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 the 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 for each of the three areas outlined above.

The application provides the calculations utilized in determining the proper silt fence and berm 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. The following deficiencies need to be addressed prior to Division approval:

**R645-301-742.300-** The Permittee should provide information (both written as well as the correlating plan drawings) that demonstrate the proposed diversions of five drainages will be designed, located, constructed maintained and used to: be stable and prevent, to the extent possible, additional contributions of suspended solids. A figure provided in Attachment 5-4 depicts 5 watersheds that will necessitate the placement of culverts within their respective drainages. Installing a culvert is considered a Diversion per R645-State of Utah Coal Mining Rules. The Permittee must provide discussion as to how the proposed access road's design and culvert installations will not impact these drainages.

**R645-301-731.600-** The Permittee should provide a discussion as to whether the stream buffer zone requirements apply to the affected drainages. In the event that a 100' buffer zone is required yet located in areas impractical or impossible to establish, the Permittee should provide the Division with a commitment to establish buffer zone markers where possible as provided for in R645-301-521.261.

**645-301-741-** requires site-specific plans that describe the plans and techniques to be utilized for the control of drainage from disturbed and undisturbed areas. The Permittee should provide a detailed description (written narrative with references to design drawings and plans) of the sediment control techniques to be implemented during the operational and reclamation phases of the proposed access road and degas well.

The Permittee should also provide justification and evidence that the proposed sediment control measures will be effective in controlling sediment removal from the disturbed areas. The discussion should take into account the maintenance of the proposed sediment control structures.

**TECHNICAL MEMO**

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**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, -301-626, -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 on page 5-13 that degas well G-19 will be returned to its approximate original contour after the cessation of methane venting. Attachment 5-1 of the application provides a cross-section that depicts the final surface configuration. The contours depicted in Figure 1 of Attachment 5-1, represent the pre-disturbance topography, which will be the final topography once reclamation is completed.

**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. The road utilized to access degas well G-19 is an existing road and as such, will be retained after reclamation activities.

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**TECHNICAL MEMO**

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**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:**

Degas well G-19 is located within the current cumulative impact area. 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. Deficiencies have been outlined within the text of this analysis and should be addressed by the Permittee prior to Division approval.