

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

September 10, 2007

TO: Internal File

THRU: *SKC* Steve Christensen, Environmental Scientist II, Hydrologist, Team Lead

FROM: Peter Hess, Environmental Scientist III / Engineering *PHH by an*

RE: Methane Degasification Wells G-18, G-31 and the AMV Road, Canyon Fuel Company, Dugout Canyon Mine, C/007/0039, Task ID #2843

SUMMARY:

The Permittee submitted a proposal to the Division on July 10, 2007 to permit the potential drilling of two methane degasification boreholes, (G-18 and G-31) at the Dugout Canyon Mine. A road, which has been designated as the AMV road, must be developed in order to access both well pad sites. This application will increase the amount of disturbed area acreage for the Dugout Canyon Mine by 20.45 acres.

The purpose of degasification wells G-18 and G-31 is identical to all degasification wells developed to this point, which is to enhance the coal extraction process by allowing additional methane venting capability from the longwall panel being extracted. The wells will vent methane from the longwall panel designated as GIL-6. The surface location for both well pads is in Section 20 of Township 13 South Range 13 East.

All surface lands are leased by the Permittee from the Milton and Ardith Thayn Trust. Coal ownership in Section 20 where wells G-18, G-19 and G-31 are projected to intercept the Gilson seam is by the State of Utah, School and Institutional Trust Lands Administration.

The submittal, upon approval, will add 20.45 acres of disturbed area acreage to the Mine's bond reclamation liability.

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TECHNICAL ANALYSIS:

MAPS AND PLANS

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

Analysis:

All maps and plans that have been submitted with the application that are relative to well location, pad design, hydrology, or engineering design are certified by a Utah registered professional engineer.

Findings:

The minimum regulatory requirements have been addressed.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Analysis:

The purpose of the proposed methane de-gasification wells is to enhance the venting/dilution capability of the mine's ventilation system, such that dangerous levels of methane gas are not allowed to accumulate within the gob area (area where the coal seam has been extracted and the roof has been allowed to cave) and/or the bleeder entries. The Permittee has determined that degasification well bores are necessary to reduce methane levels in the gob areas and bleeders to the point that coal can be efficiently mined and anticipated production levels can be met. Wells G-18 and G-31 are being permitted via this application.

As depicted on FIGURE 5-16, TYPICAL WELL DESIGN (DOGM approved / incorporated August 11, 2006), the wells will be drilled to depths such that the hole bottom will stop twenty-five feet above the roof elevation of the Gilson coal seam. Depending on the amount of overburden at the specific well site, the well depths could vary from 1250 to 2050 feet.

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The Task ID # 2843 application (September 5, 2007 submittal) does not contain any information relative to R645-301-600, **Geology**. Degasification wells are, as stated above, stopped approximately twenty-five feet above the roof horizon of the seam being extracted. In general, no geologic data is collected at the well sites. Therefore, none of the coal seam or the strata above it will be extracted for analysis. Degasification wells are permitted by the DOGM as a mining related activity under the R645 coal rules.

None of the methane wells will be plugged immediately after drilling is completed, as their purpose is to bleed off the combustible gases within the mine, improving safety conditions and mining productivity. The anticipated life/usage of the degasification hole(s) is unknown at this time. The US DOI/BLM and the Division have determined that well life and initiation of plugging / reclamation activities are to be determined by the Permittee / Mine operator.

Findings:

This application is being reviewed as an addition to previous degasification well applications and it will be reviewed as an amendment to the mining and reclamation plan.

EXISTING STRUCTURES:

Regulatory Reference: 30 CFR 784.12; R645-301-526.

Analysis:

The proposal to construct the methane degasification wells will occur in an area well outside of the disturbance created by the Mine's facilities. There are no known dwellings, public buildings, schools, churches, or community buildings within 1,000 feet of the pre-determined well locations. There is no indication that blasting will be done during the construction/ reclamation process of the well sites. This regulation is not applicable.

Findings:

The minimum regulatory requirements of this section have been met.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

Analysis:

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Renewable Resources Survey

A discussion relative to **Structures and Renewable Resource Lands** is included as part of Chapter 5, page 5-27 of the Dugout Canyon Mine mining and reclamation plan. Same indicates that there are no major electrical transmission lines, pipelines, or agricultural drainage tile fields within the area to be extracted using long wall mining methods. All roads in section 20 are the private property of the heirs of the Milton and Ardith Thayn Trust. As previously mentioned, the permittee has been granted use of these roads via the surface lease agreement between Canyon Fuel Company and the heirs of the Milton and Ardith Thayn Trust.

Subsidence Control Plan

Chapter 5, page 5-8, section **525 Subsidence** (Task ID #2828) of the application indicates "no subsidence will occur at the well sites, as a result of drilling and development of the degasification well sites. Subsidence could occur at the well site because of underground mining..." The application references Section 525 of the approved mining and reclamation plan.

As the long wall panel is extracted from the Gilson seam, the roof will cave behind the shields as the face is mined and the shields are advanced. Although the broken material will swell to a certain extent as it breaks and falls, some settling of material will propagate to the surface, and the elevation of all surface over the extracted panel will be diminished.

A review of the Attachment 5-2, Location of Methane Drainage Wells as received with the Task ID # 2828 application indicates that proposed degasification wells G-18 and G-31 will complement the methane extraction activities associated with longwall panel GIL-6. The surface location of G-18 is two-thirds across the GIL-6 panel longwall face. The surface location of G-31 is also about one third the distance across the GIL-6 longwall face. G-31 appears to be a vertical hole, where G-18 is an angled hole.

Subsidence Monitoring is discussed in Volume 3, Chapter 5, pages 5-28 through 5-31 of the approved mining and reclamation plan. The commitment made by the permittee on page 5-30 is to install one monitoring point per long wall panel.

Performance Standards For Subsidence Control

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All access roads within the surface lease agreement area are owned by the surface landowners, the heirs of the Milton and Ardith Thayn Trust. There are no public roads involved in the submittal.

Findings:

This regulation is not applicable to this submittal.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, -301-420.

Analysis:

The permittee's submittal commits to controlling fugitive dust in operational areas used by mobile equipment (See Chapter 4, page 4-7, section 424, **Fugitive Dust Control Plan**, Task ID #2828 submitted July 9, 2007. The application of water will be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition unless it is below freezing.

Findings:

The submitted information meets the minimum regulatory requirements of this section.

COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

Analysis:

As stated previously, the methane wells will be drilled to depths varying from 1250 to 2050 feet, depending on the amount of overburden at the well location. All boreholes will be stopped at a depth that correlates to twenty-five feet above the roofline elevation of the Gilson coal seam. No coal will be recovered from the seams that are being mined within the Dugout Mine permit area. No test borings or drill cores are planned at the well sites.

Findings:

This regulation is not applicable to this amendment.

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The permittee has an approved subsidence control plan in place, as evidenced via review of the approved mining and reclamation plan.

Notification

Chapter 5, page 5-34, section **525.300 Public Notice of Proposed Mining**, (See Dugout Canyon Mine MRP) indicates that "each owner of property or resident within the area above an underground mining block and adjacent area that may be affected by subsidence will be notified by mail at least six months prior to mining or within that period if approved by the Division". That notification will include 1) the identification of specific areas in which mining will take place, 2) dates the specific areas will be undermined, and 3) the location or locations where the Dugout Canyon Mine subsidence control plan may be examined.

Findings:

The information provided meets the minimum regulatory requirements of this section.

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:

Road Classification System

The privately owned access roads will remain in place after the venting phase of each of the wells is completed. Well sites G-18 and G-31 will require new construction of 7,300 feet of road which the Permittee has classified as ancillary. The new road construction will follow a trail which was developed by hunters, loggers and domestic stock. The ancillary classification was determined via discussion between the Permittee and the DOGM engineering staff.

Page 5-9 and 5-10, section **527.200 Description of Transportation Facilities**, paragraphs 3 through 5, of the Task ID # 2828 application describes the construction processes which will be utilized to build this additional road length. The Permittee calls the road the AMV road; a plan / topographic view of the AMV road is depicted by PLATE 1, which is contained as part of Attachment 5-4 in the Task ID # 2843 application. PLATE 1 depicts the outline of the 14 acres of disturbance associated with the new disturbance for the road. The drill pads for degasification wells G-18 and G-31 are also depicted, as well as proposed top soil storage locations, turnouts to allow vehicles to pass, and drainage controls, including culvert and water bar locations. Although the locations of the proposed culvert installations are set, the locations

and the number of water bars needed along the new construction road length is stated as approximate on PLATE 1.

The water bars are intended to minimize the acreage associated with the water shed reporting to each, as well as divert the road flow to the outslope, such that gullying on the road surface is reduced.

Attachment 5-4 as contained in the Task ID # 2846 application contains the following information;

- a) cut / fill calculations for both the 7300 foot road construction as well as the two well pads;
- b) topsoil stockpile dimensions (six piles are proposed) for the 16,000 cubic yards of topsoil which are being anticipated as recoverable from the development of the road and the two well pads.
- c) Runoff calculations, which are based on a 10 year 24 hour event, for each of the six proposed topsoil storage piles
- d) Containment Volumes needed and impounding berm designs for each of the six proposed topsoil piles for treatment of runoff and protection of the resource.
- e) Culvert designs for each of the five CMP's needed to route undisturbed flow beneath the new road to access G-18.

The road which will be developed to access degasification well sites G-18 and G-31 will be built on a route which has been determined by grazing cattle through the years; the road has been classified as an ancillary road by Division personnel. A road will have a minimum width of fourteen feet. A typical road cross-section is shown in Attachment 5-4, FIGURE 1. A berm is depicted along the edge of the outslope for drainage control. The vertical angles for the cut banks are depicted at angles varying from forty-five degrees for unconsolidated material to 64 degrees for consolidated bed rock materials. ATTACHMENT 5-4, PLATE 1 depicts turnout areas to allow passing and for topsoil storage.

The steep gradient of the undisturbed drainages and the necessity to install culverts at road crossings in at least five locations. The submittal received on September 5, 2007 contains the measures to be implemented for runoff control along the AMV road. The calculated flows and the gradients / methods of installation for the under-road undisturbed bypass culverts are discussed on pages 7-7 and 7-8 in the Task ID # 2846 application. Maximum flow velocities in the ditches reporting to each of the ephemeral drainage culverts except for culvert RRC-3 are smaller than 5 fps, therefore the submitted plan states that no erosion protection is required for the culvert inlets.

Culvert designs and the methods which will be implements to protect the culvert outlets from erosion are also discussed in Attachment 7-1, Hydrology Calculations for the AMV road.

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A review of the revised Attachment 5-4. PLATE 1 (submitted with Task ID # 2846) reveals that three culverts (RRC-1, RRC-2, and RRC-3) will be installed to divert the runoff collected in the collection ditch which parallels the head of the cut made to construct the AMV road. FIGURE 3, Road Runoff Culvert Plan, depicts the specifications for the road ditch (designated as the inby drainage channel) which is designated as a 1.5H / 1V and or 0.5H / 1V ditch. No water bars will be implemented on the AMV road to divert road runoff to the outslope.

These designs meet the requirements of **R645-301 527.210, 527.220.**

Plans and Drawings

The application contains the following proposed designs for well pads G-18 and G-31; FIGURE's 1, CONTOUR MAPs for G-18 and G-31. FIGURE 2, TYPICAL CROSS SECTIONS for G-18 and G-31 and FIGURES 3, APPROXIMATE DRILLING LOCATIONS for G-18 and G-31. All drawings depict the to be constructed ancillary road and the purpose intended for areas of that road, cut / fills necessary to construct each pad, and the reclamation contours to be established at final reclamation of these sites.

As the route to pads G-18 and G-31 is an ancillary road, it will be reclaimed after the wells are plugged and the adjacent areas are returned to approximate original contour (See page 5-16, section **553.100, Disturbed Area Backfilling and Grading, Approximate Original Contour** of the Task ID #2828 application). Lateral and longitudinal road slopes will be re-established to meet approximate original contour requirements.

Primary Road Certification

The permittee's application classifies the road to G-18 and G-31 as an ancillary road. The road surface will be constructed of compacted subsoil material. The roadway length constructed to access well sites G-19 and G-31 will be reclaimed upon the completion of the methane venting process.

Findings:

The information provided does not meet the minimum regulatory requirements of this section.

SPOIL AND WASTE MATERIALS

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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

All noncoal waste generated by the well drilling activities will be disposed of in the same manner as waste generated at the main mine facilities area.

There will be no noncoal waste disposal at the proposed well sites.

Coal Mine Waste

Chapter 5, page 5-3, section **513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil** addresses this requirement. None of these types of material will exist at the well sites.

Refuse Piles

No refuse piles will exist at the well sites, (Chapter 5, page 5-3, Section **513.400, Refuse Piles**).

Impounding Structures

“No permanent impoundments will exist at the well sites, “ (See Chapter 7, page 7-11, section **733.200 Permanent and Temporary Impoundments** of the submittal).

Burning And Burned Waste Utilization

This section is not applicable to this submittal.

Coal Processing Waste

No coal processing waste will be generated within the well sites, (Chapter 5, page 5-17, section **553.200 Spoil and Waste**).

Excess Spoil:

This section is not applicable to this submittal.

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Findings:

The permittee has addressed those sections that are felt to be relevant to the proposed drilling of methane vent wells G-18, G-31 and the AMV road. The submitted information is adequate to meet the minimum regulatory requirements of this section.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

Analysis:

The proposed methane vent wells are intended to enhance the mine ventilation system, allowing additional venting and dilution capability for the combustible mine gases that are inherent in the coal seam, as well as the adjacent strata. Thus, they are a support facility.

Chapter 5, page 5-8, section **526.200 Utility Installation and Support Facilities** of the submittal addresses this requirement. According to that information, no utilities will be installed at the well sites. A portable methane-exhausting unit will be installed, and the operation of that machine will be initiated with portable propane tanks. Upon start up, the device will be switched over to operate from the methane concentrations venting from the well, and will thus be self-sufficient.

Findings:

The information provided meets the minimum regulatory requirements of this section.

SIGNS AND MARKERS

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

Analysis:

Chapter 5, pages 5-6 and 5-7, section **521.100, Signs and Markers** addresses this requirement of the R645 Coal Mining Rules. The application commits the permittee to install a mine and permit identification sign at each well site that is developed. The identification sign will contain the following information: mine name, company name, company address, and telephone number, MSHA identification number, and the permanent program identification number.

The application commits the permittee to install disturbed area perimeter markers to identify all acreage to be affected before beginning mining activities.

Stream buffer zone signs will not be needed for well sites G-18 and G-31.

Topsoil storage signs will be placed on all topsoil stockpiles.

All signs and markers will be maintained until no longer needed, generally until all Phase III bond release requirements have been met.

Findings:

The information provided meets the minimum regulatory requirements of this section.

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:

Mining Facilities Maps

The methane well submittal includes three maps/drawings for each of the proposed well sites G-18 and G-31. These include:

- 1) A contour map, which depicts the undisturbed surface contour, and the relationship of the well pad.
- 2) A typical cross section for each well pad, depicting the pre-disturbed and final reclamation surface configuration, as well as the operational surface configuration.
- 3) A plan view of the "approximate" drilling layout for each of the proposed well sites showing the drill hole location and the mud pit. The plan view shows the various methods to control and treat intercepted precipitation, including sloping the pad(s), and the installation of berms and silt fences.

All figures for G-18 and G-31 are P.E. certified by Mr. Richard B. White, Utah registered professional engineer.

Mine Workings Maps

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ATTACHMENT 5-2 (Task ID #2828, for Degasification wells G-18, G-31 and AMV access road, received 7/11/2007 in the Price Field Office) contains the drawing Location of Methane Drainage Wells. This drawing was approved and incorporated by the Division on March 23, 2007, for wells G-13 through G-17, and was not re-submitted with the G-19 application. ATTACHMENT 5-2 shows the location of G-19. Degasification wells G-18 and G-31 will also vent gases from the GIL-6 longwall panel.

Monitoring and Sampling Location Maps

All maps relative to this requirement are incorporated into the approved mining and reclamation plan for the Dugout Canyon Mine.

Certification Requirements

As noted above, all plans, drawings, and maps that are relative to this submittal have been certified by a Utah registered professional engineer.

Findings:

The submitted information is adequate to meet the minimum regulatory requirements of this section.

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:

Upon completion of the wells, all drilling machinery will be removed and the mud pits backfilled and compacted. Each disturbed well site will be reclaimed by returning it to approximate original contour, (See Chapter 5, page 5-13, section **537.200, Regrading of Settled and Revegetated Fills**), roughening, and reseeding the area. An exhaust blower will be set up to create a low pressure area across the well head, allowing the combustible mine gases to vent to the atmosphere.

Upon completion of the venting phase (as determined by Canyon Fuel Company management), wells G-18 and G-31 will be sealed in accordance with Federal Regulations 43 CFR Chapter 11, Subpart 3484 (3), per a decision by the BLM and UDOGM. The remaining disturbed area will be returned to approximate original contour (See Chapter 5, page 5-15, **542.700 Final Abandonment of Mine Openings and Disposal Areas**). Revegetation activities will commence; the only remaining equipment will be the disturbed area perimeter fence, and the permittee identification sign, which will remain until authorization is granted by the Division to remove the sign.

Findings:

The minimum regulatory requirements have been addressed.

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:

Upon completion of the drilling phase of the well(s), the disturbance(s) will be reclaimed by regrading that portion not necessary for the venting phase to approximate original contour, (See Chapter 5, page 5-17, section **553.100 Disturbed Area Backfilling and Grading, Approximate Original Contour**) roughening the area to enhance moisture retention and re-seeding the area with the seed mix approved by the Division. See page 5-13, Chapter 5, section **537.200, Regrading of Settled and Revegetated Fills** (TASK ID# 2828). As indicated, "upon completion of the well site, the areas not required for the exhaust blower will be regraded to approximate original contour". If any settling should occur within the reshaped area, the permittee's submittal makes the commitment to regrade the settled areas.

After the venting phase of the degasification wells has been completed, the remainder of the disturbance will be reclaimed, returning the acreage associated with the venting phase to approximate original contour. This will be followed by roughening and reseeded of the area. The disturbed area perimeter fence and the associated permittee identification signs will remain in place until the Division has made a determination that all reclamation standards have been adequately addressed.

Findings:

The submitted information meets the minimum regulatory requirements of this section.

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BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

General

See previous analysis under **APPROXIMATE ORIGINAL CONTOUR RESTORATION**.

Previously Mined Areas

The area has not been mined previously; the requirements of this section are not applicable to the methane well submittal.

Backfilling and Grading On Steep Slopes

Chapter 4, page 4-1, section **411.120 Land Capability** (Task ID #2828), indicates, "the well site areas are located on the flatter mesa tops and rolling terrain". A review of FIGURES 1, and 2, (2 sets of each for the two wells proposed) which are the contour maps / cross sections for well site G-18 and G-31, reveals that the lateral cross sections identified as B-B' exist at a vertical angle of ten degrees or less. The R645 Coal Mining Rules define steep slopes as any slope which is twenty degrees or more as measured from horizontal. The fill slope which will be constructed as part of this reclamation will not require special consideration(s) to achieve a stable back filled area.

Special Provisions for Steep Slope Mining

This requirement is not applicable to this submittal, as mining is not being conducted..

Findings:

The information submitted meets the minimum regulatory requirements of this section.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

Reclamation of the methane vent wells is addressed in Chapter 5; section **540 RECLAMATION PLAN**, section **542.700, Final Abandonment of Mine Openings and Disposal Areas**, and section **560, PERFORMANCE STANDARDS**. The commitments made within these sections address both the requirements of R645-301-529 and 43 CFR Chapter 11, Subpart 3484 (3).

Section **541.100, Commitment** indicates, "Upon the permanent cessation of methane venting, Dugout Canyon Mine will seal the wells and permanently reclaim all affected areas in accordance with the R645 regulations and this reclamation plan."

The sealing of wells involves meeting the minimum regulatory requirements associated with R645-301-765. Page 7-13, **Chapter 7, HYDROLOGY**, section **748, Casing and Sealing Wells**, refers one to **Chapter 5, ENGINEERING**, section **542.700, Final Abandonment of Mine Openings and Disposal Areas**. Page 5-13 states, "upon the permanent cessation of methane venting, Dugout Canyon Mine will seal the wells and permanently reclaim all affected areas in accordance with the R645 regulations and this reclamation plan". The casings on de-gas well sites G-18 and G-31 will be plugged at the bottom to hold concrete. A lean concrete mixture will be poured into the casing until the concrete is within five (5) feet of the surface. At that time, the casing will be cut off at ground level and the rest of the casing will be filled with lean concrete. The concrete will be allowed to harden before the final reclamation is completed."

Methane degasification wells are unique in that they are drilled to a depth that is approximately twenty-five feet above the coal seam that is being extracted. As the longwall face retreats and extracts the coal from the area beneath the borehole, the roof caves as the longwall shields are advanced in order to protect the machinery. Hopefully, the roof caves up to the bottom of the degasification well, completing the circuit, and allowing atmosphere containing mine gases to be vented to the surface. An exhaust blower will sit on the surface creating a low pressure across the wellhead, venting the mine gases from the underground gob area.

It is generally accepted that more than 90% of the subsidence associated with coal extraction via longwall mining methods will occur within the first year after completion of the extraction process. The casing of the methane vent well may be subjected to crushing or shearing anywhere along its length, due to the shifting, bending and/or breaking of the strata adjacent to the well. Thus, the venting of combustible gases from the gob areas of the mine may be short lived. The plugging of these casings may only be effective in preventing adverse environmental or health and safety effects to a certain extent. The prevention of cross contamination of aquifers may not be possible in consideration of the fact that the plugging of the hole may not be possible for its entire depth.

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Findings:

The permittee has committed to plugging the degasification well casings to the extent possible to prevent adverse environmental damage or possible effects to health and safety. This commitment is the best that can be given at this point in time, as only the future will tell if the partial plugging of the wells will be adequate. The minimum regulatory requirements of this section have been addressed.

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

Chapter 5, page 5-14, section **542.600 Roads** of the methane well submittal addresses this requirement. Well sites G-18 and G-31 will require new road construction having a length of 7, 300 feet. The road has been classified as ancillary, as it will be constructed on a route established by grazing cattle. This trail has also seen use as a loggers drag path, and hiking foot trail. The road will be reclaimed after the venting phase is completed at wells G-18 and G-31.

Retention

As mentioned elsewhere in this technical memorandum, the roads which existed prior to the development of any of the degasification wells at Dugout Canyon will remain, as they are under the control of the surface owners, the heirs of the Milton and Ardith Thayn Trust. The ancillary road constructed to access well sites G-18 and G-31 will be reclaimed as soon as possible after the venting phase for each of those wells is completed. The surface use agreement in place between Canyon Fuel Company and the Trust allows the permittee the use of the roads for the length of the agreement.

Findings:

The submitted information meets the minimum regulatory requirements of this section.

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

General

Upon completion of the drilling phase of the well(s), approximately 60-70% of the disturbance(s) will be reclaimed by regrading that portion to approximate original contour, (See Chapter 5, page 5-15, section **-553.100 Disturbed Area Backfilling and Grading, Approximate Original Contour**) roughening the area to enhance moisture retention and re-seeding the area with the seed mix approved by the Division. See page 5-12, Chapter 5, section **-537.200, Regrading of Settled and Revegetated Fills**. As indicated, "upon completion of the well site, the areas not required for the exhaust blower will be regraded to approximate original contour". If any settling should occur within the reshaped area, the permittee's submittal makes the commitment to regrade the settled areas.

Findings:

The submitted information meets the minimum regulatory requirements.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Affected Area Boundary Maps

The general location of the proposed wells is depicted on PLATE 1-4, which shows the permit boundary for the Dugout Canyon Mine. The proposed disturbance for wells G-18, G-31 and the AMV road is depicted on FIGURES 1 and 3, and Attachment 5-4, PLATE 1. All figures are P.E. certified by a Utah registered professional engineer.

Bonded Area Map

The bonded area for wells G-18 and G-31, and the new AMV access road construction is depicted by FIGURES 1, and Attachment 5-4, PLATE 1.

Final Surface Configuration Maps

TECHNICAL MEMO

The permittee has committed to returning the drill pad areas to approximate original contour. The final surface configurations at the well sites will resemble the pre-mining surface contours depicted on FIGUREs 1 and 2.

Certification Requirements

All maps and drawings requiring certification as listed under R645-301-512 are P.E. certified by Mr. Richard B. White, Utah registered professional engineer.

Findings:

The submitted information meets the minimum regulatory requirements of this section.

RECOMMENDATION:

The application is deficient. In accordance with the requirements of

1. **R645-301 527.210, 527.220**, the Permittee must submit designs for inlet and outlet protection for the five proposed undisturbed bypass road culverts, a design for the water bars which will be implemented to route road drainage to the outslope of the access road, and provide a commitment to minimize erosion to the extent possible at each water bar location where flows will report off the road into undisturbed soils.

The Permittee must address these requirements prior to receiving a recommendation for approval