

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

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June 17, 2005

TO: Internal File

FROM: Peter H. Hess, Environmental Scientist III/Engineering, Co-Team Lead  
Wayne Western, Environmental Scientist III/Bond Requirements, Co-Team Lead

RE: Methane Degasification Wells GVH#4, Andalex Resources, Inc., Centennial Project, Aberdeen Mine, C/007/0019, Task ID #2273

### **SUMMARY:**

The permittee submitted a proposal to the Division on June 9, 2005 to permit the potential drilling of methane degasification borehole GVH #4. This well is necessary to vent additional methane volumes from the current longwall panel which is being mined in the Centennial Project Aberdeen Mine (Longwall Panel #6). To date, two holes have been drilled to vent the combustible gases being generated by the extraction process. These holes have only provided marginal success, as the Permittee has still not been able to satisfactorily control and maintain combustible gas levels in ranges acceptable to the U.S. Department of Labor, Mine Safety and Health Administration. Thus, the Permittee feels that the addition of this third hole in Panel #6 will provide the additional venting capability necessary to allow the Mine to produce in an efficient manner.

GVH# 4 will be located in Section 1 of Township 13 South, Range 10 East. Surface ownership is by the Mathis Land, Inc. Coal ownership is by the United States of America, and is managed by the U.S. Department of the Interior, Bureau of Land Management under Federal lease UTU-66060.

The Division has reviewed and approved the following degasification wells prior to the receipt of the GVH#4 application;

- 1) GVH#1, approved March 10, 2005;
- 2) GVH#'s 5 and 6, approved on April 8, 2005;
- 3) GVH#2, approved on May 4, was not drilled in the selected location, but was drilled as GVH #3 in an alternate location.

Holes GVH #'s 5 and 6 are located in Longwall Panel #7, which is the next panel to be mined.

The submittal has been designated as Task ID #2273.

This review is relative to the engineering discipline for gob vent hole GVH #4 only.

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**TECHNICAL ANALYSIS:**

**GENERAL CONTENTS**

**IDENTIFICATION OF INTERESTS**

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

**Analysis:**

The Identification of Interest information is in the Mining and Reclamation Plan, Volume 1, Section R645-301-112, Identification of Interests.

The U.S. Department of Labor, Mine Safety and Health Administration has issued three identification numbers relative to the Centennial Project; these are:

- 1) MSHA No. 42-01474 for the Pinnacle Mine,
- 2) MSHA No. 42-01750 for the Apex Mine, and
- 3) MSHA No. 42-02028 for the Aberdeen Mine.

**Findings:**

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

**VIOLATION INFORMATION**

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

**Analysis:**

Violation information is in Section 113 of the MRP.

**Findings:**

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

## RIGHT OF ENTRY

Regulatory Reference: 30 CFR 778.15; R645-301-114

### Analysis:

The permittee does not have a signed surface-use agreement in place with the surface landowners, David R. and Mildred Cave, et al., and Mathis Land Company.

Federal Coal lease UTU-66060 (Graves Lease) allows the Permittee the authority to access the roof strata above the coal seam relative to Section 1, T13S, R10E, (GVH # 4).

A legal description for this coal lease is located in Chapter 1, pages 1-20 and 1-21 of the approved MRP. This lease contains all coal in Lots 1-4, S1/2N1/2, SE1/4 of Section 1, which is where GVH #4 will be located. UTU-66060 also includes coal in Sections 12, and 31 of T13S, R10E, as well as in sections 31 and 32 of 12S, R11E. The lease was initiated on October 3 1994. Thus, the lease is current and Andalex has all legal right to penetrate the coal seam via drilling at location GVH #4.

### Findings:

The minimum regulatory requirements of this section have been met.

## LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

### Analysis:

TABLE 1-1, Degas Well Locations, Pine Canyon, Utah Quadrangle, Salt Lake Meridian as depicted on Page 1-1 of the submittal provides the legal description for methane degasification wells GVH #4. FIGURE 1-1, included with the submittal depicts the eight proposed well locations as they relate to the permit boundary for the Aberdeen Mine. Therefore, the need for the applicant to address that the permit area is within an area designated as unsuitable for mining is unnecessary. The well locations exist within the area that has been permitted for coal extraction.

### Findings:

The minimum regulatory requirements have been addressed.

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**PERMIT TERM**

Regulatory References: 30 CFR 778.17; R645-301-116.

**Analysis:**

The current State of Utah mining permit issued by the Division of Oil, Gas and Mining was renewed on May 24, 2002. Same remains in effect until January 6, 2007. The proposal to drill well GVH-4 for the Centennial Project / Aberdeen Mine operation has been received during the current permit term.

**Findings:**

The minimum regulatory requirements have been met.

**PUBLIC NOTICE AND COMMENT**

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

**Analysis:**

The proposal to permit and drill well GVH #4 at the Aberdeen Mine will occur on private surface land owned by Mathis Land Company. The permittee has surface use lease agreement in place with Mathis Land Inc., effective June 15, 2005 which allows the Permittee access to the surface in Section 1, T13S, R10E for the purpose of “drilling 12 inch shafts from the surface to their mining operation.....to vent methane gas from the Mine”. As all surface activities will occur on private land and a surface landowner agreement is in place, there is no need for a public notice and comment period.

**Findings:**

The requirements of this regulation have been addressed.

**PERMIT APPLICATION FORMAT AND CONTENTS**

Regulatory Reference: 30 CFR 777.11; R645-301-120.

**Analysis:**

This proposal is an amendment or modification to the currently approved mining and reclamation plan, which is an integral part of the permit. The determination that the permit

application consisted of the proper format and adequately addressed the requirements of the disciplines relative to completeness was made prior to the receipt of this application.

**Findings:**

A determination that the permit application was administratively complete was made prior to receipt of this amendment. This requirement is not relative.

**MAPS AND PLANS**

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

**Analysis:**

The only map submitted with this application is Figure 1-1, Aberdeen Mine, GVH Proposed Location Map. Figure 1-1 generally shows surface topography, and the underground workings of the Aberdeen Mine, with an accurate depiction of the longwall panels. Also depicted are surface property boundaries / ownership, and coal ownership. The map is not P.E. certified by a Utah registered professional engineer.

The application states on page 1-1, section **110 Introduction**, paragraph one that the GVH drilling program's purpose is to assist the Mine's ventilation program by allowing the degasification wells to vent similar quantities and qualities of combustible methane gas to the atmosphere which the Mine's main ventilation fan vents. As previously noted, four other degasification wells have been permitted for the Centennial Project.

Undisturbed surface contours can be established; the final hole locations are unknown, but are approximated on the FIGURE 1-1, uses a 600 feet per inch horizontal scale, as well as fifty-foot contour intervals. It can be visualized that the well locations will be in gently rolling terrain, at a high elevation. Previously submitted / approved text indicates that the permittee is assuming a disturbance of one acre for well site GVH #4. This assumption is excessive; most degas well sites are actually much smaller relative to the pad area.

The permittee has submitted the following maps / plans as part of the application for the GVH #1 through GVH #8 review:

- 1) Figure 5-1 is an **approximate** drill pad layout for the drilling phase of GVH #1-#8. The plan view depicts the proposed locations for the drill hole location, the mud pit location, the topsoil pile location, approximate pad dimensions, runoff controls and treatments, etc.

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- 2) Figure 5-2 is an approximate operational (degasification phase) layout of the pad. This figure depicts the area of the pad which is to be contemporaneously reclaimed, the topsoil pile location, runoff controls and treatments, access road, drill hole location, methane pump location, etc. The fence and gates surrounding the disturbed area are not depicted. However, page 5-6, section **529 Management of Mine Openings** states that “the perimeter of the sites, including the topsoil stockpiles will be fenced, with gates on the access roads”.
- 3) Figure 5-3 shows a typical cross section (profile) of the pad. Pre-disturbance, operational and reclamation contours are depicted on the figure. Also shown are the mud pit, topsoil stockpile, and runoff containment berms.
- 4) Figure 5-5 depicts a cross section of the “to be constructed” access roads necessary to develop the drill pad. A developed roadway width of sixteen feet is depicted. Topsoil that is recovered during road development is depicted as being “removed and stockpiled”.

All of the above maps have a P.E. certification by a registered Utah engineer. All maps have scale shown.

**Findings:**

The minimum regulatory requirements have been addressed.

**COMPLETENESS**

Regulatory Reference: 30 CFR 777.15; R645-301-150.

**Analysis:**

The permittee’s initial application to permit the degasification well GVH #1 through GVH #8 for the Aberdeen Mine long-walling system was received on February 23, 2005. The provided information is lacking; however, the document contains commitments to address missing information as the well site is being developed.

**Findings:**

The provided information does not meet the minimum regulatory requirements for completeness. Before approval, the Permittee must provide the following in accordance with:

**R645-301-150**, the permittee must provide information requested by the Division relative to biological data, archeological clearance, etc., as determined necessary by those disciplines to meet the minimum regulatory requirements.

## **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 well 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. It has been determined that well GVH #4 is necessary to provide additional venting capability for the #6 longwall panel in the Aberdeen Mine. At the present time, the operating efficiency of the long wall has been greatly reduced in the Aberdeen Mine due to a determination by MSHA that the ventilation requirements mandated by 30 CFR Part 75 are still not being met.

The Task ID #2161 application contains a typical well design (See FIGURE 5-4) depicting the amount of cover over the coal seam, the depth and diameter of any proposed surface casing(s), or nominal hole diameters / casing sizes as depth increases.

De-gas wells are generally drilled to a depth which is approximately 25 feet above the upper horizon of the coal seam being extracted.

Figure 5-4 is not relative to well GVH #4, as the coal seam has already been extracted from beneath the locations where the degasification well is depicted. GVH #4 will be drilled until the boring holes through into the longwall "gob" area.

The Division is concerned about how controls will be implemented to restrict venting in the hole before the drilling equipment can be extracted, and the wellhead is set. The permittee needs to address this not only with the Division, but also with the U.S. Department of Labor, Mine Safety and Health Administration. MSHA is the government agency responsible for reviewing and approving the Mine's ventilation plan. The gob degasification boreholes are an amendment to that plan.

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**The permittee must have safety controls / methods (i.e., a “blow-out” prevention device) or other methods / plans acceptable to MSHA for controlling pre-mature venting of gases in place prior to the initiation of drilling activities at wells GVH #1, #2 and #3.**

**Chapter 6, Geology**, page 6-2, section **624.300 Test Boring and Drill Hole Data**, states, “no test borings or drill cores are planned at the sites”. None of the coal seam will be extracted for analysis; the coal seam will not be intercepted. The wells will be permitted as a mining related activity under the R645 coal rules.

None of the gob degasification holes GVH #1 through GVH #8 will be plugged post drilling, 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, (See page 5-5, Chapter 5 of the application, section **526.200 Utility and Support Facilities**).

Degasification wells have proven to be an effective method of lowering levels of combustible gases in other underground coal mines. However, each of these wells, is by their very nature, another opening to the atmosphere which is capable of supplying oxygen to the mine’s workings. Thus, each well has the potential to be a liability in the event of a mine emergency.

The Division also has a concern relative to the number of holes which are being permitted for development, but are being allowed to remain unplugged for an undetermined length of time. Although Appendix X contains a reclamation timetable for all of the degasification wells being permitted within the Centennial Project permit area, that schedule lacks clarity and is not specific as to when the **final** reclamation activities (i.e., permanent closure of the well casings, etc.) will commence.

Relative to the plugging portion of the reclamation process, the Division feels that more finite criteria need to be established to determine when methane venting has been completed for each well and when plugging of the well(s) can be initiated. The Division believes that the plugging of each of the degasification wells associated with the completed longwall panel should begin within two weeks of the completion of the underground section sealing process. The oldest of the degas wells should be plugged first, but no criteria exists regarding a specific plugging sequence. The Division believes that a Permittee should not have more than three unplugged wells in existence at a time. Regarding the remaining reclamation at each of the permitted well sites, the Division expects the Permittee to live up to the commitment made in Figure 5-6 of Appendix X.

**Findings:**

The minimum requirements of this section have not been met. In accordance with

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**R645-301-529.100, R645-301-541.300, and R645-301-551** the Permittee must commit to the following;

- 1) **initiate plugging in order to permanently close all degasification wells which have been determined as no longer being necessary** for venting purposes from the completed long wall panel within two weeks of the sealing off of the underground section.
- 2) The Permittee must notify the Division one week prior to the completion of mining in the active longwall panel when mining will terminate;
- 3) The Permittee must notify the Division when underground sealing operations will commence, and when it is anticipated that the underground sealing operations will be completed.
- 4) The Permittee must commit to plugging as many degasification wells as possible which have been determined to no longer be needed each year during the third quarter up to and/or prior to the onset of winter weather conditions.

### EXISTING STRUCTURES:

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

#### Analysis:

The proposal to construct the methane degasification well 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. No blasting will be done during the construction / reclamation process of the wells. This regulation is not applicable.

#### Findings:

There are no known structures in the area of the methane well development site. This regulation is not applicable.

### PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR784.17; R645-301-411.

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**Analysis:**

There are no public parks in the area where the well is being proposed. Archaeological surveys of the well sites have, to date, not been performed. There are no cemeteries, or units of the National System of Trails or the Wild and Scenic Rivers System located within the well site boundaries. All surface land is privately owned.

Although all activities will be conducted on privately owned surface, the permittee has agreed to notify the Utah State Historic Preservation Office of previously unidentified cultural resources discovered during the course of operations of the wells (see page 4-1, section **411.140 Cultural and Historic Resources Information** of the application).

**Findings:**

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

**RELOCATION OR USE OF PUBLIC ROADS**

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

**Analysis:**

All access roads within section 1, T13S, R10E, section 31, T12S, R11E, and section 36, T12S, R10E are owned by the surface landowners. 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 watering of the access roads (both the private surface roads as well as the portions to be constructed). See Chapter 4, page 4-3, section **424, Fugitive Dust Control Plan**, Task ID #2273. 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 2,250 to 2,670 feet, depending on the amount of overburden at the well location. Boreholes #5, 6, 7 and 8 will be stopped at a depth that correlates to twenty-five feet above the roofline elevation of the coal seam. No coal will be recovered from these boreholes. No test borings or drill cores are planned at the well sites. Boreholes #1, 3, and 4 in Long Wall panel #6 will intercept the Mine workings in an area where the coal seam has already been extracted.

**Findings:**

This regulation is not applicable to this amendment.

**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 a **Survey of Structures and Renewable Resource Lands** is included as part of Chapter 5, page 5-149 of the Centennial Project mining and reclamation plan. Same indicates that there are no structures present other than those constructed for mining operations, on the permit area. The land is presently used for grazing and wildlife habitat that constitutes a renewable resource area. All roads in the area are the property of David R. and Mildred Cave, et al or the Mathis Land Company. "Andalex Resources, Inc. commits to mitigate all subsidence related damage to renewable resources including, but not limited to water, grazing, and wildlife habitat including raptor nests", (See aforementioned section of MRP)."

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**Subsidence Control Plan**

Chapter 5, page 5-5, section **525 Subsidence** (Task ID #2161) 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 sites because of underground mining...”. The application references Section 525 of the approved mining and reclamation plan.

As previously noted, the coal seam where holes GVH #1, #3, and #4 are located has already been extracted. The roof has caved, and the broken material has swollen to a certain extent. Andalex utilizes a unique method of ground control for minimizing bounces (energy releases) while the longwall pillar is being extracted. Five hundred foot wide barriers are left between the panels. Annual subsidence information that has been submitted prior to 2004 indicates that these barrier pillars eliminate any and all settling of the overburden over the mined area.

These should be no subsidence or minimal subsidence at GVH #1, #3, or #4 for two reasons:

- 1) Its close proximity to one of these 500 foot barriers, and
- 2) The coal seam has been extracted; any subsidence that may have been possible has more than likely already occurred.

**Performance Standards For Subsidence Control**

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

**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**

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The privately owned access roads will remain in place after the venting phase of the wells is completed. Each of the road lengths that will be constructed to access the sites has been classified as “primary”. Each will be reclaimed upon the final reclamation of the well site (See page 5-8 (Task ID #2161), section -**542.600, Roads**. FIGURE 5-5, TYPICAL ROAD CROSS SECTIONS (Task ID #2161) depicts the basic design that will be used to construct the roadway lengths that are necessary to access the methane well pads. A roadway width of sixteen feet will be cut/filled for the distance necessary to access each well site. FIGURE 5-5 is P.E. certified by Mr. Dan Guy, Utah registered professional engineer.

### **Plans and Drawings**

The application contains a typical road cross section for the length of access which requires construction, FIGURE 5-5. The drawing depicts an access roadway width of sixteen feet. The drawing is P.E. certified by Mr. Dan Guy, Utah registered professional engineer. Each well site will have a different access road length; this will make it difficult to estimate a reclamation bond amount for each well.

There are no plan views of the “to be constructed” access road lengths for wells GVH #1 through GVH #8, as the exact locations of each site have not been determined. All “generalized” or “typical” figures are P.E. certified by a Utah registered professional engineer.

### **Primary Road Certification**

The permittee’s application classifies the roadway lengths that require construction for wells GVH #1 through GVH #8 as primary. These roads will have surface constructed of compacted native subsoil material. The road is depicted on FIGURE 5-1, (general). The roadway length that is developed to access each well pad location will be reclaimed upon the completion of the methane venting process.

### **Findings:**

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

## **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.

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**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 6, Geology**, page 6-2, section **625**, (Task ID #2161) states, "A sampling waiver is not requested at this time for the well sites". Section **624.300**, page 6-2 also states "no test borings or drill cores are planned at the well sites". Therefore, none of the coal seam will be extracted for analysis. The wells will be permitted as a mining related activity under the R645 coal rules, and not as a minor coal exploration application.

None of the methane wells will be plugged post drilling, as their purpose is to bleed off the combustible gases within the Mine, improving safety conditions and mining productivity. The anticipated life/usage of each degasification hole is unknown at this time.

**Findings:**

The minimum regulatory requirements of this section have been addressed.

**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 proposed 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:**

There are no known structures in the area of the methane well development sites. This regulation is not applicable.

## AIR POLLUTION CONTROL PLAN

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

### Analysis:

The permittee's submittal commits to watering of the access roads (both the private surface roads as well as the portions to be constructed). See Chapter 4, page 4-3, section **424, Fugitive Dust Control Plan**, Task ID #2161. 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.

## 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, the gob area, and the adjacent strata. Thus, they are a support facility.

Chapter 5, page 5-5, section **526.200 Utility 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 bottles. Upon start up, the device will be switched over to operate from the methane concentrations venting from the well, and thus, will be self-sufficient.

### Findings:

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

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## **SIGNS AND MARKERS**

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

### **Analysis:**

Chapter 5, page 5-4, section **521.200, Signs and Markers** addresses this requirement of the R645 coal 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 required at the proposed well site.

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 (Task ID#2161) includes three maps/drawings for the well that is being proposed; these include:

- 1) A plan view drawing, which depicts the “venting phase” of the pad area, showing a portion of the acreage that has been contemporaneously reclaimed.

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- 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 three figures for each of the three proposed wells are P.E. certified by Mr. Dan Guy, Utah registered professional engineer.

### **Mine Workings Maps**

Not applicable to this amendment.

### **Monitoring and Sampling Location Maps**

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

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**Analysis:**

Upon completion of the drilling activities, all machinery will be removed and the mud pits backfilled and compacted. The area of the pad not needed for the venting process will be reclaimed by returning it to approximate original contour, (See Chapter 5, page 5-7, 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. This will remain at the site for the length of the life of the well.

Upon completion of the venting phase, the blower and wellhead will be removed and the well casing will be plugged to the maximum depth possible, up to an elevation five feet below the surface. The casing will then be cut off, and final reclamation activities will then commence, returning the remaining disturbed area to approximate original contour (See Chapter 5, page 5-8, section **542.700 Final Abandonment of Mine Openings and Disposal Areas**).

Task ID# 2161, (Appendix X) contains as Figure 5-6, a reclamation schedule for all of the degasification wells being permitted for the Centennial Project permit area.

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 same.

**Findings:**

The minimum regulatory requirements have been addressed.

**POSTMINING LAND USES**

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

**Analysis:**

Chapter 5, page 5-9, section **553.100 Disturbed Area Backfilling and Grading, Post-Mining Land Use** indicates, “the disturbed area will be reclaimed in a manner that supports the approved post-mining land use. Refer to Sections 411 and 412 for additional detail.”

Chapter 4, page 4-1, section **411.100 Pre-mining Land Use** of the submittal (Task ID #2161) indicates, “the area is utilized for the landowners private use, including hunting and as open range for livestock and wildlife.” The area is also zoned by Carbon County for “mining

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and grazing, (MG-1)”, (See section **411.130 Land Use Description**, Chapter 4, page 4-1 of the submittal, Task ID #2166). “There are no industrial or municipal facilities located on or immediately adjacent to the well sites.”

Chapter 4, page 4-2, section **412.100 Post Mining Land Use Plan** indicates that the permittee will conduct all activities in the area such that “all uses of the land prior to the wells construction/operation and the capacity of the land to support prior alternate uses will remain available throughout the life of the sites.” “Andalex Resources, Inc., intends (for) the post mining land use to be livestock and wildlife grazing and other uses as indicated by the land owner (hunting, etc.). Final reclamation activities will be completed in a manner to provide the lands able to parallel the pre-mining land use.” Thus, the permittee intends to conduct all mining operations in a manner such that the post-mining land use and the pre-mining land use are comparable.

### Findings:

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

## 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 Task ID #2273 application makes the following commitment relative to approximate original contour; “the well site will be returned to its approximate original contour after reclamation is completed, (See Chapter 5, page 5-11, section **553.100 Disturbed Area Backfilling and Grading, Approximate Original Contour**). This is understood to mean that final regrading to AOC will not be achieved until after the well is plugged to its entire depth, and the methane pump and other structures have been removed from the site.

“Sediment controls will consist of gouging the surface to create depressions and mounds which store and impede the movement of water. As vegetation becomes established on the reclaimed surface, erosion potential will be further minimized”, (See Task ID# 2273 submittal, Chapter 5, page 5-11, section **553.100 Disturbed Area Backfilling and Grading / Erosion and Water Pollution**).

Page 5-12, Chapter 5, section **553.900, Regrading of Settled and Revegetated Fills** (TASK ID# 2272) makes the following commitment; “if settlement or rills occur at the well site,

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they (it) will be regarded and revegetated. Refer to Section 244.300". After the venting phase of the longwall panel has been completed, the remainder of the disturbance will be reclaimed, returning the acreage associated with venting phase to approximate original contour. This will be followed by roughening and reseeding 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.

**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 #2161), indicates the following, "the major plant communities at the well sites are identified in Section 321. No cultivated lands lie within the well boundaries, due to the limiting terrain and lack of water for irrigation. Refer to Section 321.200, Table 3-1 of this submittal for forage production per acre for each well site." Examination of well site locations on Figure 1-1 reveals that the proposed locations are generally in a gently sloping area, (although the elevation is above 8,000 feet). Therefore, there are no steep slopes (by definition, where the vertical angle is twenty degrees or more) associated with this application.

**Special Provisions for Steep Slope Mining**

This requirement is not applicable to this submittal.

**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 **550, RECLAMATION DESIGN CRITERIA AND PLANS**, and section **560, PERFORMANCE STANDARDS**.

Section **541.100, Commitment** indicates, “Upon permanent cessation of methane venting, Andalex Resources, Inc., will 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**, page5-8, section **542.700, Final Abandonment of Mine Openings and Disposal Areas**. “All openings will be sealed in accordance with Federal and State Regulations. The casings 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 on the surface creates 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

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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.

**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 5-8, section **542.600 Roads** of the methane well submittal addresses this requirement. All road lengths necessary for development of the wells have yet to be determined. Section **-542.600** states the following; “the access roads established during the drilling program will be reclaimed after gob gas extraction has been completed.” A reference is made to **Chapter 2, Section 242 Soil Redistribution** (Task ID #2161); same is in reference to that topic, which is not addressed by this section.

**Retention**

As mentioned elsewhere in this technical memorandum, the roads in place at the present time are the property of David R. and Mildred Cave, et al., and the Mathis Land Company. They will stay in place after the venting phase of the wells has been completed. The surface use agreement in place between Andalex Resources, Inc., and the two surface land owning entities allows 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 reshaped to approximate original contour, (See Chapter 5, page 5-7, 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 FIGURE 1-1, which shows the permit boundary for the Centennial Project. The proposed disturbance for each well is depicted on FIGURE 5-1 (general drawing for all wells). The figure is P.E. certified by a Utah registered professional engineer.

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**Bonded Area Map**

The bonded area for each well is depicted by FIGURE 5-1.

**Final Surface Configuration Maps**

The permittee has committed to returning the drill pad areas to approximate original contour. The final surface configuration should very closely resemble the contours depicted on FIGURES 1-1.

**Certification Requirements**

Figure 1-1 is being utilized as the “pre-mining” surface configuration, as well as the “final surface configuration” map, in conjunction with the permittee’s commitment to reclaim each of the well sites to approximate original contour. Figure 1-1 is not P.E. certified. In order to meet the requirements of **R645-301-512.130** and **542.300**, FIGURE 1-1 must be P.E. certified.

**Findings:**

The submitted information does not meet the minimum regulatory requirements of this section. Before approval, the Permittee must provide the following in accordance with:

**R645-301-512.130** and **542.300**, FIGURE 1-1 must be P.E. certified.

**BONDING AND INSURANCE REQUIREMENTS**

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

**Analysis:**

**Determination of Bond Amount**

The current bond amount for the Centennial Project is \$1,080,839. The Division last updated the reclamation cost estimate as part of Task ID #2119 in 2004.

The Division reviewed the bond information relevant to Task ID #2161. The Permittee did not include specific information about reclamation costs, particularly the “to be constructed” access road lengths. Since the amount of disturbance is small, the Division calculated the reclamation cost based on the following assumptions:

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- One acre would be disturbed (this is consistent with the information in the operation section of the amendment, section **532, Sediment Control**).
- 5,000 cubic yards of material would be disturbed.
- An additional 1,600 cubic yards of topsoil would be spread over the site. This is based on the assumption that there is one foot of topsoil, and all of the area would be disturbed.
- The revegetation methods would be similar to those at the mine site.
- Reclamation would include plugging the well and removal of equipment.

The Division determined in March 2005, that the reclamation cost for the Centennial Project would be \$984,000 in 2009 dollars. Since the current bond is for \$1,080,839, the bond is adequate.

The Permittee must update the bond calculations in the MRP to include the cost to reclaim GVH #1 through #8. The Division will supply the Permittee with a copy of the updated bond calculations.

**Findings:**

The information provided does not adequately addresses the minimum requirements of the Reclamation Plan – Bonding and Insurance Requirements section of the regulations. Before approval, the Permittee must provide the following in accordance with:

**R645-301-830.110 and R645-301-121.300**, The Permittee must update the reclamation cost estimates for Task ID #2161. The Division will provide the Permittee with a copy of the bond in either electronic or hard copy.

**RECOMMENDATION:**

The permittee must address the deficiencies listed above before a recommendation for approval can be given.