

FILE IN Expandable 11 11 2006

Refer to Record No. 0066  
in C0070019, 2006, Incoming  
for additional information

# ANDALEX RESOURCES, INC. CENTENNIAL PROJECT

C/007/019

## CHANGE TO THE MRP REVISED APPENDIX X

TO ADD THREE ADDITIONAL  
GOB GAS VENT HOLES  
GVH#5B, GVH#7A, GVH#8A

SUBMITTED: NOVEMBER 14, 2006

ANDALEX RESOURCES, INC.

**APPENDIX X**

**CENTENNIAL PROJECT  
GOB GAS VENT HOLES**

C/007/019

(Revised)  
NOVEMBER 2006

(Revised)  
NOVEMBER 2006

**CHAPTER 1**  
**LEGAL, FINANCIAL, COMPLIANCE AND**  
**RELATED INFORMATION**

## TABLE OF CONTENTS

### Section

|            |  |            |
|------------|--|------------|
| <b>110</b> | <b>MINIMUM REQUIREMENTS FOR LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION</b> .....     | <b>1-1</b> |
| <b>111</b> | <b>Introduction</b> .....  | <b>1-1</b> |
| <b>112</b> | <b>Identification of Interests</b> .....   | <b>1-3</b> |
|            | 112.100 Business Entity .....  | 1-3        |
|            | 112.200 Applicant and Operator .....   | 1-3        |
|            | 112.300 Officers of the Applicant .....  | 1-3        |
|            | 112.400 Coal Mining and Reclamation Operation Owned or Controlled                              | 1-3        |
|            | 112.500 Legal or Equitable Owner of the Surface and Mineral<br>Properties .....                | 1-3        |
|            | 112.600 Owners of Record of Property Contiguous to Proposed<br>Permit Area .....               | 1-4        |
|            | 112.700 MSHA Numbers .....   | 1-5        |
|            | 112.800 Interest in Contiguous Land .....  | 1-5        |
|            | 112.900 Certification of Submittal Information .....   | 1-5        |
| <b>113</b> | <b>Violation Information</b> .....   | <b>1-5</b> |
| <b>114</b> | <b>Right-of-Entry</b> .....  | <b>1-5</b> |
| <b>115</b> | <b>Status of Unsuitability</b> .....   | <b>1-7</b> |
| <b>116</b> | <b>Permit Term</b> .....   | <b>1-7</b> |
| <b>117</b> | <b>Insurance, Proof of Publication, and Facilities and Structures Used<br/>In Common</b> ..... | <b>1-7</b> |
| <b>118</b> | <b>Filing Fees</b> .....   | <b>1-7</b> |
| <b>120</b> | <b>PERMIT APPLICATION FORMAT AND CONTENTS</b> .....  | <b>1-7</b> |
| <b>130</b> | <b>REPORTING OF TECHNICAL DATA</b> .....   | <b>1-7</b> |
| <b>140</b> | <b>MAPS AND PLANS</b> .....  | <b>1-7</b> |
| <b>150</b> | <b>COMPLETENESS</b> .....  | <b>1-7</b> |

**TABLE OF CONTENTS (Continued)**

**LIST OF TABLES**

|                  |                                    |     |
|------------------|------------------------------------|-----|
| <b>Table 1-1</b> | Well Site Locations .....          | 1-2 |
| <b>Table 1-2</b> | Disturbed Acres by Well Site ..... | 1-6 |

**LIST OF FIGURES**

|                   |                             |
|-------------------|-----------------------------|
| <b>Figure 1-1</b> | Gob Gas Vent Hole Locations |
|-------------------|-----------------------------|

## 110 MINIMUM REQUIREMENTS FOR LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION

### 111 Introduction

This project is a "Ventilation Assistance Program", wherein hazardous "gob gas" from the longwall will be partially vented to the surface. The quantity and quality of the vented gas will be the same as that presently being discharged at the mine fan. The discharged "gob gas" will be of no commercial value.

Five holes have been approved and drilled in 2005. These are holes GVH#1, GVH#3, GVH#4, GVH#5 and GVH#6. Four additional holes were completed in 2006 - GVH#5A, GVH #7, GVH #8 and GVH #9. Three additional holes are proposed with this submittal - GVH #5A, GVH #7A and GVH #8A. (GVH #7A will be drilled on the existing disturbed pad area of GVH #7.)

The holes will be located on surface property owned by Dave R. and Mildred Cave, et al., and Mathis Land, Inc. The mineral rights are owned by Mathis Land, Inc. And the United States Government (B.L.M.) And are under lease by Andalex Resources, Inc.

The existing and proposed hole locations are described in Table 1-1 and are shown on Figure 1-1.

**TABLE 1-1**  
**Gob Gas Well Locations (see Figure 1-1)**  
**Deadman Canyon, Utah Quadrangle, Salt Lake Meridian**

| Hole Number | Status         | Section | Township and Range |
|-------------|----------------|---------|--------------------|
| GVH-1       | Hole Completed | 31      | T.12S., R.11E.     |
| GVH-3       | Hole Completed | 31      | T.12S., R.11E.     |
| GVH-4       | Hole Completed | 1       | T.13S., R.10E.     |
| GVH-5       | Hole Completed | 31      | T.12S., R.11E.     |
| GVH-6       | Hole Completed | 31      | T.12S., R.11E.     |
| GVH-5A      | Hole Completed | 31      | T.12S., R.11E.     |
| GVH-7, 7A*  | Hole Completed | 31      | T.12S., R.11E.     |
| GVH-8       | Hole Completed | 36      | T.12S., R.10E.     |
| GVH-9       | Hole Completed | 36      | T.12S., R.10E.     |
| GVH-5B      | Proposed       | 31      | T.12S., R.11E.     |
| GVH-8A      | Proposed       | 36      | T.12S., R.10E.     |

\* GVH #7A (re-drill) proposed on existing pad area GVH #7.

## **112 Identification of Interests**

Refer to the same section of the approved M&RP.

### **112.100 Business Entity**

Refer to the same section of the approved M&RP.

### **112.200 Applicant and Operator**

Applicant and Operator: Andalex Resources, Inc  
Tower Division  
P.O. Box 902  
Price, Utah 84501  
Telephone: (435) 637-5385

Contact Person and  
Resident Agent: Michael W. Glasson  
Andalex Resources, Inc  
Tower Division  
P.O. Box 902  
Price, Utah 84501  
Telephone: (435) 637-5385

**Responsibility:** Andalex Resources, Inc. is responsible for submission of information and will pay abandoned mine reclamation fees.

### **112.300 Officers of the Applicant**

Refer to the same section of the approved M&RP.

### **112.400 Coal Mining and Reclamation Operation Owned or Controlled**

Refer to the same section of the approved M&RP.

### **112.500 Legal or Equitable Owner of the Surface and Mineral Properties**

The legal and equitable owner of the surface and mineral properties to be affected by this operation during the duration of the permit period are listed below:

Surface Owners

David R. & Mildred Cave, et al.  
144 South 1650 East  
Price, Utah 84501

Mathis Land Co.  
Sunnyside Star Route  
Price, Utah 84501

Sub-Surface Owners

United States of America  
Bureau of Land Management  
Utah State Office  
136 East South Temple  
Salt Lake City, Utah 84111

Mathis Land Co.  
Sunnyside Star Route  
Price, Utah 84501

**112.600 Owners of Record of Property Contiguous to Proposed Permit Area**

Owners of record for surface and mineral properties contiguous to the proposed permit area are listed below:

Contiguous Surface Owners

David R. & Mildred Cave, et al.  
144 South 1650 East  
Price, Utah 84501

Mathis Land Co.  
Sunnyside Star Route  
Price, Utah 84501

F. and D. Shimmin  
711 North 500 East  
Price, Utah 84501

### Contiguous Sub-Surface Owners

United States of America  
Bureau of Land Management  
Utah State Office  
136 East South Temple  
Salt Lake City, Utah 84111

State of Utah  
School Trust Lands Administration  
675 East 500 South  
Salt Lake City, Utah 84102

Mathis Land Co.  
Sunnyside Star Route  
Price, Utah 84501

#### **112.700 MSHA Numbers**

Refer to the same section of the approved M&RP.

#### **112.800 Interest in Contiguous Lands**

Andalex Resources, Inc. has no interest in contiguous lands other than those currently owned as shown on Plate 1A of the approved M&RP.

#### **112.900 Certification of Submittal Information**

No information has changed in the approved M&RP because of this submittal. Refer to the same section of the approved M&RP.

#### **113 Violation Information**

Refer to the same section in the approved M&RP.

#### **114 Right-of-Entry Information**

Refer to the same section of the approved M&RP. A surface use agreement with the private surface owners is in place. A memorandum of this agreement is included in the MRP and is on record at the County Recorder's office. (See Appendix X-1)

Since each proposed well site has not been finally located or surveyed in the field, an assumed disturbance of 1.0 acres is used as an estimate for each site.

See Table 1-2 for actual disturbed acreage for each completed well site. The actual disturbed acres will be added to the total disturbed acreage for the Centennial Project as each site is constructed and surveyed.

**TABLE 1-2  
Disturbed Acres by Well Site**

| Well Site | Status         | Disturbed Acres |          |
|-----------|----------------|-----------------|----------|
|           |                | Original        | Existing |
| GVH-1     | Hole Completed | 1.15            | 0.52     |
| GVH-3     | Hole Completed | 1.11            | 0.55     |
| GVH-4     | Hole Completed | 0.95            | 0.45     |
| GVH-5     | Hole Completed | 0.97            | 0.51     |
| GVH-6     | Hole Completed | 1.49            | 0.46     |
| GVH-5A    | Hole Completed | 0.76            | 0.59     |
| GVH-7, 7A | Hole Completed | 0.50            | 0.33     |
| GVH-8     | Hole Completed | 0.65            | 0.65     |
| GVH-9     | Hole Completed | 0.81            | 0.81     |
| GVH-5B    | Proposed       | -               | -        |
| GVH-8A    | Proposed       | -               | -        |

\* GVH #7A (re-drill) proposed on existing pad area GVH #7.

### **115 Status of Unsuitability Claims**

Refer to the same section of the approved M&RP.

### **116 Permit Term**

Refer to the same section of the approved M&RP.

### **117 Insurance, Proof of Publication, and Facilities and Structures Used in Common**

The certificate of insurance(s) for each well will be obtained if required when the well is drilled. The certificate of insurance(s) will be included in Appendix B of the approved M&RP.

### **118 Filing Fees**

Refer to the same section of the approved M&RP.

## **120 PERMIT APPLICATION FORMAT AND CONTENTS**

This amendment submittal will comply with R645-301-120.

## **130 REPORTING OF TECHNICAL DATA**

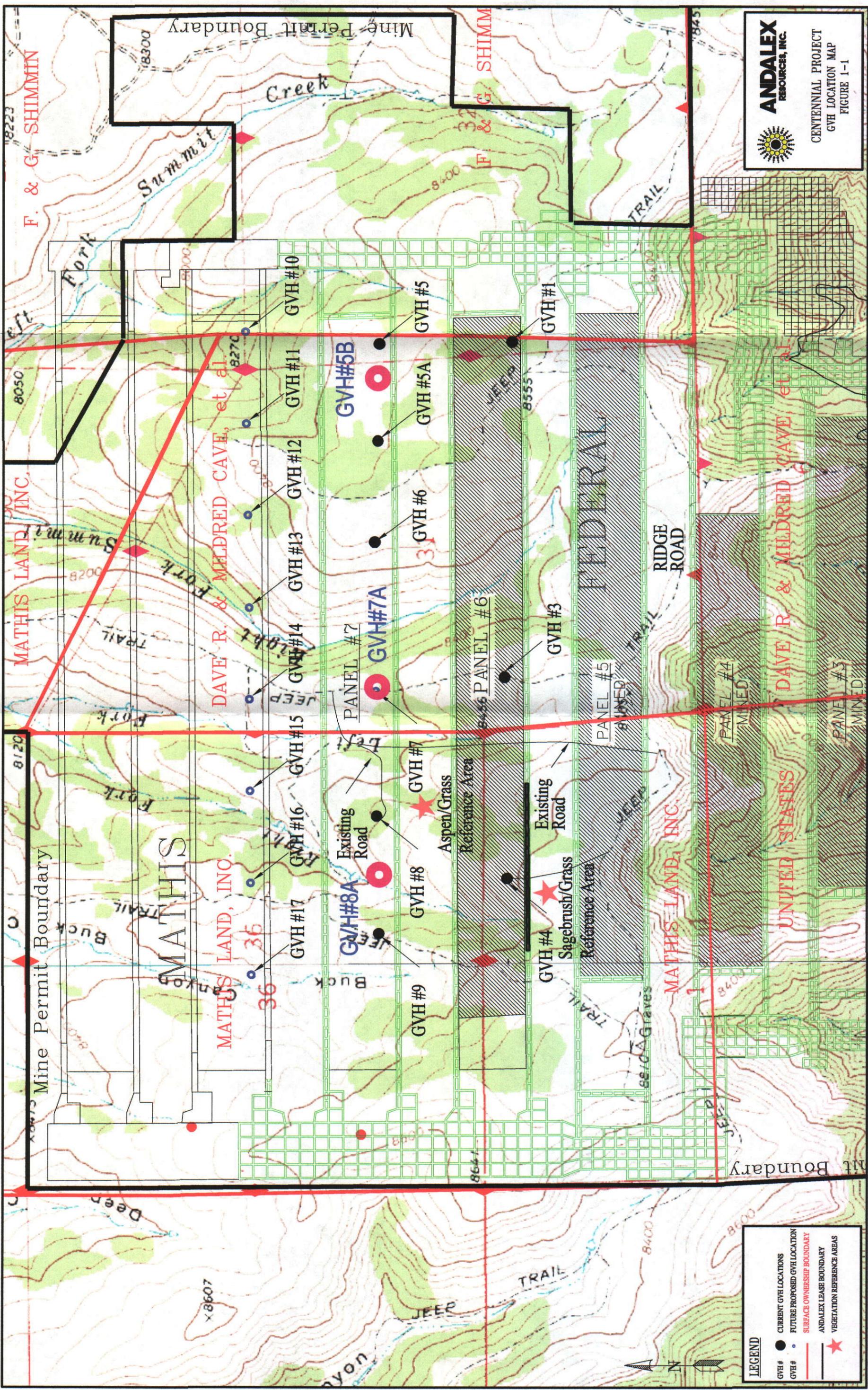
All technical data submitted in the amendment will be accompanied by the name or organization responsible for the collection and analysis of data, dates of collection and descriptions of methodology used. Technical analyses will be planned by or under the direction of a qualified professional in the subject to be analyzed.

## **140 MAPS AND PLANS**

The maps and plans in the Mining and Reclamation Plan will correspond with the requirements in R645-301-140.

## **150 COMPLETENESS**

Andalex Resources, Inc. believes the information in this permit application to be complete and correct.



**LEGEND**

- CURRENT G.V.H. LOCATIONS
- FUTURE PROPOSED G.V.H. LOCATION
- SURFACE OWNERSHIP BOUNDARY
- ANDALEX LEASE BOUNDARY
- ★ VEGETATION REFERENCE AREAS

**ANDALEX**  
RESOURCES, INC.

CENTENNIAL PROJECT  
G.V.H. LOCATION MAP  
FIGURE 1-1

**(Revised)**  
**NOVEMBER 2006**

**CHAPTER 2**  
**SOILS**

## TABLE OF CONTENTS

### Section

|            |  |     |
|------------|--|-----|
| <b>210</b> | <b>INTRODUCTION</b> .....  | 2-1 |
| <b>220</b> | <b>ENVIRONMENTAL DESCRIPTION</b> .....   | 2-1 |
| <b>221</b> | <b>Prime Farmland Investigation</b> .....  | 2-1 |
| <b>222</b> | <b>Soil Survey</b> .....   | 2-1 |
|            | 222.100 Soils Map .....  | 2-1 |
|            | 222.200 Soil Identification .....  | 2-2 |
|            | 222.300 Soil Description .....   | 2-2 |
|            | 222.400 Soil Productivity .....  | 2-2 |
| <b>223</b> | <b>Soil Characterization</b> .....   | 2-3 |
| <b>224</b> | <b>Substitute Topsoil</b> .....  | 2-3 |
| <b>230</b> | <b>OPERATION PLAN</b> .....  | 2-4 |
| <b>231</b> | <b>General Requirements</b> .....  | 2-4 |
|            | 231.100 Removing and Storing Topsoil Methods .....   | 2-4 |
|            | 231.200 Suitability of Topsoil Substituted/Supplements .....                                   | 2-4 |
|            | 231.300 Testing of Topsoil Handling and Reclamation<br>Procedures Regrading Revegetation ..... | 2-5 |
|            | 231.400 Construction, Modification, Use, and Maintenance<br>Of Topsoil Storage Pile .....      | 2-5 |
| <b>232</b> | <b>Topsoil and Subsoil Removal</b> .....   | 2-6 |
|            | 232.100 Topsoil Removal and Segregation .....  | 2-6 |
|            | 232.200 Poor Topsoil .....   | 2-6 |
|            | 232.300 Thin Topsoil .....   | 2-6 |
|            | 232.400 Minor Disturbances Not Requiring Topsoil Removal .....                                 | 2-7 |
|            | 232.500 Subsoil Segregation .....  | 2-7 |
|            | 232.600 Timing .....   | 2-7 |
|            | 232.700 Topsoil and Subsoil Removal Under Adverse Conditions .....                             | 2-7 |

## TABLE OF CONTENTS (Continued)

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| <b>233 Topsoil Substitutes and Supplements</b> .....                         | 2-7         |
| 233.100 Overburden Materials Supplementing and/or Replacing<br>Topsoil ..... | 2-7         |
| 233.200 Suitability of Topsoil Substitutes and Supplements .....             | 2-7         |
| 233.300 Physical and Chemical Analysis .....                                 | 2-8         |
| 233.400 Testing of Substitute Topsoil .....                                  | 2-8         |
| <b>234 Topsoil Storage</b> .....   | 2-8         |
| 234.100 Topsoil Stockpiling .....  | 2-8         |
| 234.200 Topsoil Stockpile .....  | 2-8         |
| 234.300 Topsoil Stockpile Relocation .....                                   | 2-8         |
| <b>240 RECLAMATION PLAN</b> .....  | 2-9         |
| <b>241 General Information</b> .....   | 2-9         |
| <b>242 Soil Redistribution</b> .....   | 2-9         |
| 242.100 Soil Redistribution Practices .....                                  | 2-9         |
| 242.200 Regrading .....  | 2-11        |
| 242.300 Topsoil Redistribution on Impoundments and Roads .....               | 2-11        |
| <b>243 Soil Nutrients and Amendments</b> .....                               | 2-11        |
| <b>244 Soil Stabilization</b> .....  | 2-12        |
| 244.100 Protection and Stabilization of Surface Area .....                   | 2-12        |
| 244.200 Mulch Application .....  | 2-12        |
| 244.300 Rills and Gullies .....  | 2-12        |
| <b>250 PERFORMANCE STANDARDS</b> .....                                       | 2-12        |
| <b>251 Topsoil, Subsoil, and Topsoil Supplements Management</b> .....        | 2-12        |
| <b>252 Stockpile Topsoil and Subsoil</b> .....                               | 2-12        |

**TABLE OF CONTENTS (Continued)**

**LIST OF TABLES**

**Table 2-1** Topsoil Volumes ..... 2-3  
**Table 2-2** Topsoil Stockpile Dimensions ..... 2-6  
**Table 2-3** Topsoil Distribution Thickness ..... 2-10

**LIST OF ATTACHMENTS**

**Attachment 2-1** Soil Inventory and Assessment

## 210 INTRODUCTION

This chapter and associated attachments address the pertinent data required for the 9 degassification well sites for the Centennial Project (GVH#1, GVH#2, GVH#4, GVH#5, GVH#5A, GVH#6, GVH#7, GVH#8 AND GVH#9) as well as the 3 proposed additional well sites (GVH#5B, GVH#7A and GVH#8A). Only those sections of the Division regulations that apply to the well sites have been addressed. The remainder of the regulations have already been addressed in the existing M&RP. The M&RP and this document contain pertinent information relating to the identification, management, and reclamation activities associated with the soil resources.

## 220 ENVIRONMENTAL DESCRIPTION

The well sites range in elevation from approximately 8400 to 8600 feet. The well sites are located in the Summit Creek/Emma Park area of the Book Cliffs. General vegetation includes sagebrush-grass, aspen and oak brush communities.

### 221 Prime Farmland Investigation

Due to limiting terrain, lack of water for irrigation and no evidence of past cultivation of the sites, it is concluded that no prime farmland exists within the area of the well site disturbance.

### 222 Soil Survey

#### 221.100 Soils Map

An order I soil survey has been conducted of the area to help define the previous conditions at well sites 1, 3, 4, 5 and 6. This information will be used for final reclamation for these sites. An order 1 Soil Survey was conducted for completed sites GVH#5A, GVH#7, GVH#8 and GVH#9. Results of the order 1 surveys are provided in Attachment 2-1 "Soil Inventory and Assessment". Due to the amount of soil data gathered during the order 1 surveys done for the existing nine nearby sites and the consistent nature of the soil characteristics in the area, assumptions have been made about the nature of the soils at proposed sites GVH#5B, GVH#7A and GVH#8A. These assumptions include depth of available topsoil and quality of material. It should be noted that site GVH#5B is within and adjacent to the area previously disturbed by OSO Energy's recent pipeline construction, and GVH#7A will

be drilled within the existing disturbed pad area of GVH#7. Site GVH#8A is presently undisturbed. Photos of this site and a discussion of the existing vegetation types can be found in the vegetation report prepared by Mt. Nebo Scientific which is included in Chapter 3, Attachment 3-1. Topsoil at these sites (GVH#5B, GVH#8A) will be sampled and analyzed at time of salvage. The results of these analysis will be added to Attachment 2-1.

**222.200 Soil Identification**

See Attachment 2-1, Order 3 Soil Survey

**222.300 Soil Description**

See Attachment 2-1, Order 3 Soil Survey

**222.400 Soil Productivity**

See Attachment 2-1, Order 3 Soil Survey

**TABLE 2-1  
Topsoil Volumes**

Note: 2400 CY per Well is assumed until final surveys are done. Actual size of the pads could be less than 1 acre, in which case the volume stored will be reduced accordingly.

| Well No.  | Status         | Cubic Yards of Material |            |
|-----------|----------------|-------------------------|------------|
|           |                | Original                | Remaining* |
| GVH-1     | Hole Completed | 2778                    | 1250       |
| GVH-3     | Hole Completed | 2689                    | 1333       |
| GVH-4     | Hole Completed | 2300                    | 1083       |
| GVH-5     | Hole Completed | 2347                    | 1228       |
| GVH-6     | Hole Completed | 3611                    | 1111       |
| GVH-5A    | Hole Completed | 1839                    | 1389       |
| GVH-7, 7A | Hole Completed | 1210                    | 926        |
| GVH-8     | Hole Completed | 1573                    | 1573       |
| GVH-9     | Hole Completed | 1960                    | 1960       |
| GVH-5B    | Proposed       | 2400                    | -          |
| GVH-8A    | Proposed       | 2400                    | -          |

\* Remaining soil is after original pad reduction and contemporaneous reclamation.

**223 Soil Characterization**

See attachment 2-1, Order 3 Soil Survey

**224 Substitute Topsoil**

Andalex Resources, Inc. does not plan to use substitute topsoil as growth media unless described in Section 222.400.

## **230 OPERATION PLAN**

### **231 General Requirements**

#### **231.100 Removing and Storing Topsoil Methods**

The topsoil will be removed (and replaced) to a depth of 18 inches where the thickness exists, stockpiled and protected with a berm and/or silt fence. A qualified person will be on site during soil salvage to monitor and supervise the operation for the purpose of maximizing salvage volumes. Prior to topsoil salvage shrubs/vegetation will be removed and placed/wind rowed along the inside perimeter of the disturbed area. Stockpiled topsoil will not be allowed to remain at the angle of repose (1h:1v) for a period of longer than two weeks. During contemporaneous reclamation, or after two weeks, the stockpiled topsoil slopes will be reduced to less than 2h:1v. The topsoil will then be immediately seeded after the proper angle is achieved. Reseeding will use the approved seed mixture found in ARI's Mining and Reclamation Plan (page 3-21), or a mix recommended by the Division, and will be hand broadcast, raked in slightly and mulched with straw or alfalfa hay. Hand broadcasting requires twice the seed rate per acre as drilling.

After the topsoil is removed, the mud pit will be excavated and the soils from the mud pit excavation will be stored immediately adjacent to the mud pit. Mud pit excavation of subsoil will be approximately 110 CY at each well site. Generally, it is expected that mud pits will be excavated in an area roughly 200 square feet by 15 feet deep. A larger area is possible, should the depth not be achievable, or multiple pits may be employed. However a mud pit volume of roughly 3000 cubic feet per drill site is needed. A portable container for drilling fluids will be used if necessary, should there not be sufficient subsoil depth to excavate a mud pit (where bed rock is encountered).

Topsoil beneath the topsoil stockpiles will not be removed. Ribbon or a marking fabric will be placed on top of the topsoil prior to placement of the topsoil from the well pad area.

The volume of subsoil to be salvaged and used to create berms around the perimeter of the well including the topsoil stockpile perimeter is approximately 30 cubic yards.

#### **231.200 Suitability of Topsoil Substitutes/Supplements**

See Section 224.

### **231.300 Testing of Topsoil Handling and Reclamation Procedures Regarding Revegetation**

Andalex Resources, Inc. will exercise care to guard against erosion during and after application of topsoil and will employ the necessary measures to ensure the stability on graded slopes. Erosion control measures will include silt fences, berms, seeding, straw bales, soil roughening, and mulching of the soils.

Topsoil will be redistributed and the original soil surface beneath the topsoil stockpile will be roughened as presented in Section 242.100 and seeded with the seed mix described in Chapter 3, Section 356.

### **231.400 Construction, Modification, Use, and Maintenance of Topsoil Storage Pile**

Topsoil removed from the drill pad sites will be stockpiled on the site. The estimated volumes of topsoil stockpile for each site are shown in Table 2-1. The stockpiles will be sized as shown in Table 2-2.

The slopes of the stockpile will be 1H:1V or approximately 45° during the construction phase. Soils in these areas generally have an angle of repose greater than 50 degrees, making a stockpile with 1:1 slopes feasible. The steeper slope also help minimize the area to be disturbed. During the operational phase the remaining topsoil will be stockpiled with slopes of 2H:1V.

**TABLE 2-2  
Topsoil Stockpile Dimensions**

| Well No.  | Status    | Length (ft) | Width (ft) | Height (ft) |
|-----------|-----------|-------------|------------|-------------|
| GVH-1     | Existing  | 75          | 40         | 11          |
| GVH-3     | Existing  | 100         | 40         | 9           |
| GVH-4     | Existing  | 95          | 35         | 9           |
| GVH-5     | Existing  | 100         | 35         | 9.5         |
| GVH-6     | Existing  | 105         | 35         | 8.5         |
| GVH-5A    | Existing  | 100         | 25         | 15          |
| GVH-7, 7A | Existing  | 100         | 25         | 10          |
| GVH-8     | Existing  | 140         | 25         | 12          |
| GVH-9     | Existing  | 100         | 25         | 17.5        |
| GVH-5B    | *Proposed | 100         | 40         | 16          |
| GVH-8A    | *Proposed | 100         | 40         | 16          |

\* These are approximate dimensions of the topsoil stockpile for the proposed well sited, based on the estimated 2400 CY from Table 2-1. Actual construction dimensions may vary.

See section 234.200 for detailed information on the topsoil stockpile(s).

## **232 Topsoil and Subsoil Removal**

### **232.100 Topsoil Removal and Segregation**

All topsoil will be removed as a single layer with no segregation to a depth of 18 inches, where available. Topsoil will be removed using a dozer and/or loader. Refer to Section 231.100 for additional details.

### **232.200 Poor Topsoil**

Not Anticipated

### **232.300 Thin Topsoil**

Not Anticipated

## **232.400 Minor Disturbances Not Requiring Topsoil Removal**

Not Anticipated

## **232.500 Subsoil Segregation**

The B and C soil horizons will generally not be removed. However, in drill pad locations where the A horizon is 18 inches or less, up to six inches of sub-soil may be removed for the purpose of constructing a berm around the perimeter of the drill pad. Construction of this berm, which will be roughly triangular in shape and roughly one foot in height (1V:1H), will accumulate an additional storage of either lower A or possibly B horizon soil of approximately 800 cubic feet or 30 cubic yards of material, per site.

## **232.600 Timing**

Topsoil removal will take place after all vegetation that could interfere with salvaging the topsoil has been grubbed.

## **232.700 Topsoil and Subsoil Removal Under Adverse Conditions**

The topsoil will be removed first and stockpiled and the remaining soil horizons will be left in place, except where natural conditions render removal operations hazardous or detrimental to soils outside the disturbed area then topsoil will not be removed.

**Conventional Machines** - In locations where steep grades, adverse terrains, severe rockiness, limited depth of soils, or other adverse conditions exist that render soil removal activities using conventional machines hazardous, soils will not be salvaged and stockpiled. Such conditions are not likely to occur in these areas.

**Substitute Topsoil** - Importing of substitute topsoil is not anticipated (Section 224).

## **233 Topsoil Substitutes and Supplements**

### **233.100 Overburden Materials Supplementing and/or Replacing Topsoil**

No overburden material will be used.

### **233.200 Suitability of Topsoil Substitutes and Supplements**

No substitute topsoil is planned.

### **233.300 Physical and Chemical Analyses**

See Section 243

### **233.400 Testing of Substitute Topsoil**

No substitute topsoil is planned.

## **234 Topsoil Storage**

### **234.100 Topsoil Stockpiling**

Topsoil will be stockpiled for later use in reclamation operations.

### **234.200 Topsoil Stockpile**

**Stable Stockpile Site** - Stockpiled material will be placed on a stable site.

**Protection from Contaminants and Compaction** - To protect the topsoil from contaminants and unnecessary compaction that could interfere with vegetation, the stockpile will be isolated from the main surface area by a berm and/or silt fence. A sign designating "topsoil" will be installed on the stockpile.

The topsoil stockpile will be constructed in such a manner as to allow access for repair of the pile surfaces and diversion structures.

**Wind and Water Erosion Protection** - The topsoil stockpile will be protected from water erosion by berms, which trap sediment runoff from the stockpile. The berms have been designed to completely contain the 10-year 24-hour storm event (see Attachment 7-1). The stockpile will be surface pitted, gouged and/or roughened and revegetated using the seeds listed in Table 3-2 to prevent wind erosion.

**Topsoil Redistribution** - Stockpile soil will not be moved until redistribution during contemporaneous or final reclamation operations unless approved by the Division.

### **234.300 Topsoil Stockpile Relocation**

Stockpiles soil in jeopardy of being detrimentally affected in terms of its quality by drilling operations may be temporarily redistributed or relocated on approval by the Division and modification of this M&RP.

## 240 RECLAMATION PLAN

### 241 General Information

Reclamation of the sites (topsoil redistribution, amendments, and stabilization) is discussed in Sections 242, 243 and 244 respectively.

### 242 Soil Redistribution

#### 242.100 Soil Redistribution Practices

The topsoil will be placed after recontouring of the site has occurred. Topsoil will be handled when loose or in a friable condition. The moisture content will be visually monitored and water will be added as needed to enhance the soil's condition for handling. The approximate amount of topsoil available for each site is shown in Table 2-1.

The topsoil will be distributed in two phases at each well site. The first phase will be the contemporaneous reclamation of a portion of the pad area used during well construction (see Figures 5-2). During contemporaneous reclamation topsoil from the stockpile will be distributed on each site in the depths shown in Table 2-3.

Final reclamation will occur at all well sites after venting of the gob gas is complete, venting equipment has been removed and the well has been plugged. The topsoil stockpile storage area and any access road required to be removed will be reclaimed during this final phase. If access roads were pre-existing, they will not be reclaimed. Refer to Section 341 for additional information.

**Soil Thickness** - The topsoil will be distributed during contemporaneous and final reclamation in the thickness shown in Table 2-3. (Note: A topsoil thickness of 18" is assumed for all sites until actual measurements can be taken.)

**TABLE 2-3**  
**Approximate Topsoil Distribution Thickness**

| <b>Well Site No.</b> | <b>Status</b> | <b>Topsoil Thickness (inches)</b> |
|----------------------|---------------|-----------------------------------|
| GVH-1                | Actual        | 18                                |
| GVH-2                | Actual        | 18                                |
| GVH-3                | Actual        | 18                                |
| GVH-5                | Actual        | 18                                |
| GVH-5A               | Actual        | 18                                |
| GVH-6                | Actual        | 18                                |
| GVH-7, 7A            | Actual        | 18                                |
| GVH-8                | Actual        | 18                                |
| GVH-9                | Actual        | 18                                |
| GVH-5B               | Proposed      | 18                                |
| GVH-8A               | Proposed      | 18                                |

**Compaction** - Prior to the application of topsoil, compacted subsoils will be roughened or loosened for a depth of 18 to 24 inches. To prevent compaction of topsoil, soil moving equipment will refrain from unnecessary operation over spread topsoil. The topsoil will be in a loosened condition prior to seeding.

Following the drying of the mud pit materials, the dirt excavated to create the mud pit will be mixed with the drill cutting and returned to the pit to prevent a boundary of hard material from forming in the mud pit are that would hamper root penetration and then compacted to minimize settling.

**Erosion** - Care will be exercised to ensure the stability of topsoil on graded slopes to guard against erosion during and after topsoil application. Post reclamation (contemporaneous and final) erosion control measures will be surface roughing, mulching and seeding. Outslopes along all the access roads will be seeded with a fast growing type of seed, western wheatgrass grass for example. This will quickly establish an erosion control measure on the outslopes.

#### **242.200 Regrading**

The areas will be graded to their approximated original topographic configuration.

#### **242.300 Topsoil Redistribution on Impoundments and Roads**

The mud pits will be dismantled and filled following completion of drilling. See Section 242.100, Compaction for additional information. Mud pits will be covered with the same amount of topsoil as the rest of the site. The roads existing prior to starting the drilling program will not be reclaimed. Access roads built to allow entrance to the drilling pads will be reclaimed and will receive topsoil in the same depth as their corresponding pad areas when gob gas venting is complete.

#### **243 Soil Nutrients and Amendments**

The soils will be analyzed directly following salvage to determine if amendments are needed. Testing of the topsoil will be done according to Table 6 of the Division's Topsoil and Overburden Guidelines. The topsoil will be tested at a minimum for the following parameters: Texture, pH, electrical conductivity, total carbon, SAR, water holding capacity, plant available nitrogen, and phosphorus. Results of these analyses will be incorporated into Attachment 2-2.

## **244 Soil Stabilization**

### **244.100 Protection and Stabilization of Surface Area**

All reclaimed areas will be stabilized to control erosion by application of mulch, tackifier, and roughening of the surface. The areas will be graded to the approximately original topographic configuration. Seeding will be accomplished with the application of seeds and mulch with a long fiber tackifier or broadcast. Methods of protection and stabilization are further discussed in Chapter 3, Section 341.

### **244.200 Mulch Application**

Mulch/tackifier will be applied to stabilize the soil on all areas that have been regraded and covered with growth media. For further discussion of revegetation practices to be utilized, see Chapter 3, Section 341.

### **244.300 Rills and Gullies**

**Postmining Land Use and Revegetation** - Rills and gullies that are approximately nine (9) inches in depth and disrupt the postmining land use or reestablishment of vegetative cover will be regraded and seeded.

**Water Quality** - There are no streams immediately adjacent to the well sites.

## **250 PERFORMANCE STANDARDS**

### **251 Topsoil, Subsoil, and Topsoil Supplements Management**

All topsoil, subsoil, and topsoil supplements will be managed as outlined in Sections 230 and 240.

### **252 Stockpiled Topsoil and Subsoil**

All stockpiled topsoil and subsoil will be managed according to plans outlined in Sections 230 and 240.

**ATTACHMENT 2-1**  
**SOIL INVENTORY AND ASSESSMENT**

(Revised)  
NOVEMBER 2006

**CHAPTER 3**  
**BIOLOGY**

## TABLE OF CONTENTS

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| <b>310 INTRODUCTION</b> .....  | 3-1         |
| <b>311 Vegetative, Fish and Wildlife Resources</b> .....                     | 3-1         |
| <b>312 Potential Impacts to Vegetative, Fish and Wildlife Resources</b> .... | 3-1         |
| <b>313 Description of Reclamation Plan</b> .....                             | 3-1         |
| <b>320 ENVIRONMENTAL DESCRIPTION</b> .....                                   | 3-1         |
| <b>321 Vegetation Information</b> .....                                      | 3-1         |
| 321.100 Plant Communities Within the Proposed Permit Area .....              | 3-3         |
| 321.200 Land Productivity Prior to Mining .....                              | 3-3         |
| <b>322 Fish and Wildlife Information</b> .....                               | 3-4         |
| 322.100 Level of Detail .....  | 3-4         |
| 322.200 Site-Specific Resource Information .....                             | 3-4         |
| 322.300 Fish and Wildlife Service Review .....                               | 3-8         |
| <b>323 Maps and Aerial Photographs</b> .....                                 | 3-8         |
| 323.100 Location and Boundary of Proposed Reference Area .....               | 3-8         |
| 323.200 Elevation and Locations of Monitoring Stations .....                 | 3-8         |
| 323.300 Facilities for Protection and Enhancement .....                      | 3-8         |
| 323.400 Vegetation Type and Plant Communities .....                          | 3-8         |
| <b>330 OPERATION PLAN</b> .....  | 3-8         |
| <b>331 Measures Taken to Disturb the Smallest Area</b> .....                 | 3-8         |
| <b>332 Description of Anticipated Impacts of Subsidence</b> .....            | 3-8         |
| <b>333 Plan to Minimize Disturbances and Adverse Impacts</b> .....           | 3-9         |
| 333.100 Minimize Disturbance to Endangered or Threatened Species .           | 3-9         |
| 333.200 Species and Habitats .....   | 3-9         |
| 333.300 Protective Measures .....  | 3-9         |

## TABLE OF CONTENTS (Continued)

| <u>Section</u>  | <u>Page</u> |
|---|-------------|
| <b>340 RECLAMATION PLAN</b> .....   | 3-9         |
| <b>341 Revegetation</b> .....   | 3-9         |
| 341.100 Schedule and Timetable .....  | 3-10        |
| 341.200 Descriptions .....  | 3-10        |
| 341.300 Greenhouse Studies, Field Trials or Other Equivalent<br>Studies ..... | 3-11        |
| <b>342 Fish and Wildlife</b> .....  | 3-11        |
| 342.100 Enhancement Measures .....  | 3-11        |
| 342.200 Plants Used for Wildlife Habitat .....                                | 3-11        |
| 342.300 Cropland .....  | 3-11        |
| 341.400 Residential, Public Service, and Industrial Land Use .....            | 3-11        |
| <b>350 PERFORMANCE STANDARDS</b> .....  | 3-11        |
| <b>351 General Requirements</b> .....   | 3-11        |
| <b>352 Contemporaneous Reclamation</b> .....                                  | 3-11        |
| <b>353 Revegetation: General Requirements</b> .....                           | 3-11        |
| 353.100 Vegetative Cover .....  | 3-12        |
| 353.200 Reestablished Plant Species .....                                     | 3-12        |
| 353.300 Vegetative Exception .....  | 3-14        |
| 353.400 Cropland .....  | 3-14        |
| <b>354 Revegetation: Timing</b> .....   | 3-14        |
| <b>355 Revegetation: Mulching and Other Soil Stabilizing Practices</b> ...    | 3-14        |
| <b>356 Revegetation: Standards for Success</b> .....                          | 3-14        |
| 356.100 Success of Revegetation .....   | 3-14        |
| 356.200 Standards for Success .....   | 3-15        |
| 356.300 Siltation Structures .....  | 3-15        |
| 356.400 Removal of Siltation Structures .....                                 | 3-15        |

## TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Page</u>  |
|----------------|--|
| <b>357</b>     | <b>Revegetation: Extended Responsibility Period . . . . . 3-15</b>           |
|                | 357.100 Extended Period Begins . . . . . 3-15                                |
|                | 357.200 Vegetation Parameters . . . . . 3-15                                 |
|                | 357.300 Husbandry Practices . . . . . 3-16                                   |
| <b>358</b>     | <b>Protection of Fish, Wildlife, and Related Environmental Values . 3-16</b> |
|                | 358.100 Existence of Endangered or Threatened Species . . . . . 3-16         |
|                | 358.200 Bald and Golden Eagles . . . . . 3-16                                |
|                | 358.300 Taking of Endangered or Threatened Species . . . . . 3-16            |
|                | 358.400 Replacement of Wetland or Riparian Vegetation . . . . . 3-16         |
|                | 358.500 Manmade Wildlife Protection Measures . . . . . 3-16                  |

### LIST OF TABLES

|                  |  |
|------------------|--|
| <b>Table 3-1</b> | Productivity and Percent Cover Story . . . . . 3-3                 |
| <b>Table 3-2</b> | Reclamation Seed Mix . . . . . 3-13                                |
| <b>Table 3-3</b> | Federal and State Listed T&E Species - Carbon County . . . . . 3-6 |
| <b>Table 3-4</b> | Potential Water Depletion to Colorado River Drainage . . . . . 3-7 |

### LIST OF ATTACHMENTS

|                       |   |
|-----------------------|---|
| <b>Attachment 3-1</b> | Vegetation Inventory/NRCS Letter                          |
| <b>Attachment 3-2</b> | Threatened, Endangered, and Sensitive Species Information |
| <b>Attachment 3-3</b> | 2005 Raptor Survey (Relocated to Confidential Binder)     |
| <b>Attachment 3-4</b> | Photos of GVH Sites                                       |

## 310 INTRODUCTION

This chapter presents a description of the biological resources found on the completed Centennial Project gob gas vent hole sites GVH#1, GVH#3, GVH#4, GVH#5, GVH#6, GVH#5A, GVH#7, GVH#8 and GVH #9, as well as the proposed sites GVH#5B, GVH#7A, GVH#8A. Details for each of the sites are provided in this Appendix.

### 311 Vegetation, Fish and Wildlife Resources

Vegetative, fish, and wildlife resource conditions in and adjacent to the proposed degassification wells are discussed in Section 320 of this submittal and the approved M&RP.

### 312 Potential Impacts to Vegetative, Fish, and Wildlife Resources

Potential impacts to vegetative, fish, and wildlife resources and the associated mitigation plan is presented in Section 330 and 340 of this chapter.

### 313 Description of Reclamation Plan

The reclamation plan used to restore the vegetative, fish, and wildlife resources to a condition suitable for the post mining land use is presented in Section 340.

## 320 ENVIRONMENTAL DESCRIPTION

### 321 Vegetation Information

This section and the approved M&RP contain the environmental descriptions of the vegetation for the permit and adjacent areas.

Andalex Resources has been drilling "gob" gas vent holes as a safety requirement necessary to conduct their coal mining operations within the plateaus of the Book Cliffs mountain range. Because of the extreme urgency of the situation in early 2005, permitting of some emergency gas holes began in January 2005, with drilling proceeding soon afterwards. Initially, drill holes numbered GVH-01, GVH-02, GVH-03 were proposed for drilling (GVH-02 was later dropped from the plan). Following these drilling activities, additional drilling was necessary in the late-winter/early spring months the same year (sites: GVH-05 and GVH-06). Because it was necessary for the drilling to proceed during in the winter and spring months, or when quantitative assessment of the impacted plant communities was not possible, Andalex employed "Range Site" methods in the permitting process to drive the revegetation plan and provide final revegetation standards of success.

More gas holes were necessary for venting requirements in the spring of 2005 beginning with GVH-04. Prior to disturbance by the drill rig, the plant communities to be impacted by the drilling operations were quantitatively sampled including the proposed access road and drill pad. Additionally, a "Reference Area" with the same plant community was sampled. The Reference Area was used for comparisons of the proposed disturbed site at that time and will also be used at the time of final reclamation for standards of final revegetation success.

The next completed gob gas holes were numbered GVH-05A, GVH-07, GVH-08, and GVH-09. The plant communities that would be impacted by these drilling operations were quantitatively sampled in the growing season of 2005. Reference Areas were also chosen and sampled for these communities during the same time period. The following document was submitted to Andalex to report the results of the 2005 vegetation sampling period; and is included as Attachment 3-1 of this Appendix:

VEGETATION OF THE GAS VENT HOLES:  
GVH-04, GVH-05A, GVH-07, GVH-08,  
GVH-09 & REFERENCE AREAS  
2005

for the  
CENTENNIAL MINE

by  
MT. NEBO SCIENTIFIC, INC.

January 2006

Because the aforementioned emergency drill sites GVH-01, GVH-03, GVH-05 and GVH-06 were constructed in the winter and early spring months, or before vegetation sampling could be conducted, Reference Areas for them were chosen later in the growing season of 2005 when a better assessment of them could be made. These Reference Areas will be used later as standards for final revegetation success at these sites instead of using the Range Site method mentioned above. Based on a qualitative assessment of these sites, the **Sagebrush/Grass Reference Area** as reported in the above document will be used for the emergency, or first drill sites.

Three new gob gas holes are being proposed for this submittal - GVH #5B, GVH #7A and GVH #8A. It should be noted that site GVH#5B is within and adjacent to the area previously disturbed by OSO Energy's recent pipeline construction, and GVH#7A will be drilled within the existing disturbed pad area of GVH#7. Required vegetation information for each of the proposed sites is included in a new report generated by Mt. Nebo Scientific which has been included in Attachment 3-1.

### 321.100 Plant Communities Within the Proposed Permit Area

Plate 19A of the M&RP shows the sites to be generally in the sagebrush-grass, aspen and oak brush communities. Vegetation specific to each of the sites is provided in this Appendix. A qualitative vegetative inventory (analysis) was completed during the summer of 2005. (See Attachment 3-1)

Also, ARI has taken photographs of the proposed sites prior to disturbance. These photo locations are identifiable and repeatable. Although the photo locations were not staked, landmarks in the photos provide for identification as well as direction and location. The photos are included in Attachment 3-4.

### 321.200 Land Productivity Prior to Mining

TABLE 3-1  
Land Productivity

| Well No.  | Range Site         | Productivity (lbs.)<br>Per Acre |
|-----------|--------------------|---------------------------------|
| GVH-1     | High Mountain Loam | 1800                            |
| GVH-3     | High Mountain Loam | 1800                            |
| GVH-4     | High Mountain Loam | 1800                            |
| GVH-5     | High Mountain Loam | 1800                            |
| GVH-5A    | High Mountain Loam | 1800                            |
| GVH-6     | High Mountain Loam | 1800                            |
| GVH-7, 7A | High Mountain Loam | 1800                            |
| GVH-8     | High Mountain Loam | 1800                            |
| GVH-9     | High Mountain Loam | 1800                            |
| GVH-5B    | High Mountain Loam | 1800                            |
| GVH-8A    | High Mountain Loam | 1800                            |

## 322 Fish and Wildlife Information

Fish and wildlife information associated with the degas wells is provided in this chapter. A summary of the fish and wildlife resource information for the permit and adjacent areas is contained in Section 322.100 through 322.200 of the approved M&RP.

### 322.100 Level of Detail

The scope and level of detail within the "Gob Gas Vent Holes" amendment are sufficient to design the protection and enhancement plan for wildlife and fish associated with the degas wells. Additional information pertaining to fish and wildlife in the permit area is located in the M&RP.

### 322.200 Site-Specific Resource Information

**Raptors** - An aerial raptor nest survey was done of the area by the Utah Division of Wildlife Resource personnel in 2004. The results of the survey are provided in Appendix D of the M&RP. *Additional surveys have been done in 2005 and 2006, and are included with this submittal in the Confidential Binder for the Centennial Project.*

A raptor survey will be conducted of the well site areas, each year that the wells are in operation.

**Bats** - No known open mine shafts, caves, adits or other man made structures that might provide habitats for bats are known to exist in the degas project area. The sites are open and the lack of a food source would force the bats to seek habitat and nourishment elsewhere.

**Threatened and Endangered Plant and Wildlife Species** - There are no known federally or state listed threatened and endangered plant and wildlife species within the sites planned for degassification wells. This is based on research and analysis by Mt. Nebo Scientific of Springville, Utah and EIS of Helper Utah. The Bureau of Land Management has also reviewed the access and drill sites and has stated that although this area represents important habitat for both Mule deer and Elk, it is not characterized as crucial or critical.

There are no known groundwater or surface water flows to the Colorado or Green Rivers with potential for impact by the drilling of the degas wells. Potential adverse effects to the four Colorado River endangered fish species (refer to Table 3-3) would not be likely since there is no direct route to the Colorado River or Green River from the proposed well locations. Per the Windy Gap Process consumption estimates for the degas wells are as follows: Drilling - approximately 100,000 gallons per hole; road watering - approximately 5,000 gallons per day for 70 days per year; evaporation from ventilation - zero, drill holes will not intersect the coal seam being mined, therefore no access to mine ventilation until after area is sealed; coal preparation - zero, no coal preparation at degas sites (see Sections 522 and 523); sediment pond evaporation - zero, no sediment pond at degas sites (see Section 732.200); subsidence effects on springs - zero, no anticipated subsidence at degas sites (see Section 525); alluvial aquifer abstraction into mines - zero, no alluvial

aquifer abstractions associated with degas drill holes (see Sections 513.500 and 600); postmining inflow to workings - zero, no workings for postmining inflow associated with degas wells (see Sections 513.500 and 600); coal moisture loss - zero, no coal therefore no moisture loss (See Sections 522 and 523). The overall impact of the mining operations, (including the degas holes) is shown on Table 3-4. Based on these calculations, the mining operation has a net positive impact to the Colorado River Drainage by the addition of 45.001 ac.ft./year.

**Table 3-3**  
**Federal and State Listed, Threatened, Endangered and Candidate Species**  
**Plants and Wildlife**  
**Carbon County, Utah**  
**October, 2002**

**CARBON**

|  |   |
|--|---|
| Graham Beardtongue                     | <i>Penstemon grahamii</i>               |
| Uinta Basin Hookless Cactus            | <i>Schlerocactus glaucus</i>            |
| Bonytail <sup>4, 10</sup>              | <i>Gila elagans</i>                     |
| Colorado Pikeminnow <sup>4, 10</sup>   | E<br><i>Ptychocheilus lucius</i>        |
| Humpback Chub <sup>4, 10</sup>         | <i>Gila cypha</i>                       |
| E<br>Razorback Sucker <sup>4, 10</sup> | <i>Xyrauchen texanus</i>                |
| E<br>Bald Eagle <sup>3</sup>           | <i>Haliaeetus leucocephalus</i>         |
| T<br>Mexican Spotted Owl <sup>4</sup>  | <i>Strix occidentalis lucida</i>        |
| T<br>Western Yellow-billed Cuckoo      | <i>Coccyzus americanus occidentalis</i> |
| Black-footed Ferret <sup>6</sup>       | <i>Mustela nigripes</i>                 |
| E                                      |   |

- 1 Nests in this county of Utah
- 2 Migrates through Utah, no resident populations.
- 3 Wintering populations (only five known nesting pairs in Utah).
- 4 Critical habitat designated in this county.
- 5 Critical habitat proposed in this county
- 6 Historical range.
- 7 Experimental nonessential population
- 8 Introduced, refugia population.
- 9 Candidate species have no legal population under the Endangered Species Act. However, these species are under active consideration by the Service for addition to the Federal List of Endangered and Threatened Species and may be proposed or listed during the development of the proposed project.
- 10 Water depletions from any portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery programs.

For additional information contact: U.S. Fish and Wildlife Service, Utah Field Office, 2369 West Orton Circle, Suite 50, West Valley City, Utah 84119 Telephone (801) 975-3330.

**Table 3-4**  
**Potential Water Depletion**  
**to**  
**Colorado River Drainage**

The following calculations are intended to define the potential depletion or addition of water to the Colorado River Drainage System, as a result of mining at this operation. It should be noted that the criteria is based on the U.S. Fish and Wildlife Service Windy Gap Process, and only those parameters that apply to this operation have been calculated.

**Projected Water Depletion**

- 1- Bathhouse/Office
    - a. 140 people @ 35 gpd/ea x 240 days/yr = 1,176,000 gal/yr
  
  - 2- Ventilation
    - a. Evaporation
      - 1) 450,000 cfm = 236,520 M cf/yr
      - 2) 2.5 gallon/M cf = 591,300 gal/yr
  
  - 3- Drilling GVH Wells
    - a. 5 holes/yr @ 100,000 gal/hole = 500,000 gal/yr
  
  - 4- Road Watering (GVH Sites)
    - a. 5,000 gpd x 70 days/yr = 350,000 gal/yr
- Total Loss = 2,617,300 gal/yr  
8.033 ac ft/yr

**Projected Water Addition**

- 1- Mine Discharge
    - a. 100 gpm x 120 days/yr = 17,280,000 gal/yr
- Total Gain = 17,280,000 gal/yr  
53.034 ac ft/yr

**Summary**

|                       |                         |
|-----------------------|-------------------------|
| Projected Depletion = | -8.033 ac ft/yr         |
| Projected Addition =  | +53.034 ac ft/yr        |
| Total Addition =      | <u>+45.001 ac ft/yr</u> |

Note: Moisture loss from mined coal and use of sprays have not been included, since the spray water is derived from perched aquifers and is recycled within the mine. Any excess water from the perched aquifers is eventually discharged, resulting in the addition to streamflow.

### **322.300 Fish and Wildlife Service Review**

If requested, Andalex Resources, Inc. authorizes the release of information pertaining to Section 322 and 333 to the U.S. Fish And Wildlife Service Regional and Field Office for their review.

### **323 Maps and Aerial Photographs**

Location of the well sites can be seen in Figure 1-1 of this submittal.

### **323.100 Location and Boundary of Proposed Reference Area**

Reference areas for all well sites have been established as described in Section 321. Subsequent holes will also use standard reference areas including baseline data.

### **323.200 Elevation and Locations of Monitoring Stations**

N/A

### **323.300 Facilities for Protection and Enhancement**

Section 333.300 and 358.500 of the approved M&RP contain additional discussion pertaining to protective measures to be taken by Andalex Resources, Inc.

### **323.400 Vegetation Type and Plant Communities**

Vegetative types and plant communities are outlined in the vegetative report in Attachment 3-1.

## **330 OPERATION PLAN**

### **331 Measures Taken to Disturb the Smallest Possible Area**

The well sites will be sized to disturb the smallest acreage possible and still meet the requirements for the drilling equipment. The drainage control required will be built to satisfy the environmental requirements. Please refer to the typical proposed site plans for the gob gas wells which show estimated dimensions, location and type of sediment control, location of topsoil storage as well as approximate size and set-up of equipment.

### **332 Description of Anticipated Impacts of Subsidence**

Refer to Section 525.

### **333 Plan to Minimize Disturbances and Adverse Impacts**

General control and mitigation measures addressing potential related biological impacts will include the following:

- Well sites will be fenced per landowner requirements and suitable for wildlife protection.
- Minimizing the total area of disturbance.
- Yearly raptor surveys during operations.
- Utilizing existing roads where possible.
- Water used for drilling and dust suppression is pumped from mine.
- Providing erosion protection and dust control as needed on roads.
- Design, construction and operation of well sites to minimize adverse impacts.
- Coordination and planning with the interdisciplinary wildlife team.
- Reclamation of disturbed areas when no longer needed.

#### **333.100 Minimize Disturbance to Endangered or Threatened Species**

Andalex Resources, Inc. will apply all methods necessary to minimize disturbances or any adverse effects to threatened or endangered species. Note that T&E species are not anticipated to be discovered, however, should ARI determine that such species exist, the regulatory authority will be notified and appropriate remedial action taken. Also, See Section 322.200.

#### **333.200 Species and Habitats**

All species and habitats within the permit area will be protected to the best of Andalex Resources, Inc. ability. Note that T&E species are not anticipated to be discovered, however, should ARI determine that such species exist, the regulatory authority will be notified and appropriate remedial action taken.

#### **333.300 Protective Measures**

Refer to Section 333.300 of the approved M&RP, and Section 333 above. All well sites will be fenced and road construction will be minimized by utilizing existing roads where possible.

### **340 RECLAMATION PLAN**

#### **341 Revegetation**

Revegetation of the sites will occur in two phases. The first phase is to redistribute topsoil and seed the well area not needed for access and operation of the gas exhaust blower. The second phase will consist of plugging the well and distributing the remaining topsoil and seeding on the remaining pad area. Refer to Section 242.100 for additional detail.

The second phase will consist of plugging the well and distributing the remaining topsoil and seeding on the remaining pad area. Refer to Section 242.100 for additional detail.

The short-term goal of this revegetation plan is the immediate stabilization of the disturbed sites through erosion control this objective will be achieved through controlled grading practices, proper seedbed preparation to encourage rapid plant establishment, inclusion of rapidly establishing species in the seed mixture to be planted, and mulch application.

The long-term goals are to establish useful, and productive range. These goals will be attained through the selection and placement of desirable and productive plant species and a commitment to monitor and maintain revegetated areas throughout the bond liability period.

The well sites will be fenced to discourage wildlife and livestock from grazing the reclaimed areas until bond release.

### **341.100 Schedule and Timetable**

The reclamation timetable shown in Figures 5-6 of this submittal and the reclamation monitoring schedule is found in Chapter 2, R645-301-240 of the approved M&RP.

### **341.200 Descriptions**

**Species and Amounts of Seed** - The well sites will be planted with the seed mix listed on Table 3-2. The seed mix will be used in both contemporaneous and final reclamation phases. The seed will be incorporated with a small amount of wood fiber mulch and applied by hydroseeding equipment or broadcast. Refer to Section 234.200 for topsoil stockpile seeding description.

**Methods Used for Planting and Seeding** - The degassification sites will be graded to final contour, then ripped to relieve compaction. The depth of ripping will be from 18 to 24 inches. Following ripping, topsoil will be applied to the ripped surface and left in a gouged and roughened state.

**Mulching Techniques** - Wood fiber mulch will be applied on top of the seed with hydroseeding equipment at the rate of 2,000 pounds per acre and anchored with a tackifier.

**Irrigation, Pest, and Disease Control** - No irrigation is planned and pesticides will not be used unless previously approved by the Division.

**Measures Proposed for Revegetation Success** - Refer to Section 356.

**341.300 Greenhouse Studies, Field Trials, or Other Equivalent Studies**

Refer to the Section 341.300 of the approved M&RP.

**342 Fish and Wildlife**

**342.100 Enhancement Measures**

Post bond release enhancement measures will include the establishment of vegetation for wildlife food, cover, and the break up of large blocks of monoculture to diversify habitat.

**342.200 Plants Used for Wildlife Habitat**

**Nutritional Value** - The nutritional value will be consistent with that of vegetation in the surrounding areas.

**Cover** - Cover will be comparable to the cover on the associated reference area.

**342.300 Cropland**

Cropland is not a postmining land use.

**342.400 Residential, Public Service, and Industrial Land Use**

No residential, industrial or public service use is planned.

**350 PERFORMANCE STANDARDS**

**351 General Requirements**

Andalex Resources, Inc. commits to conduct all operations in accordance with the plans submitted in Sections R645-301-330 through R645-301-340 of the permit application.

**352 Contemporaneous Reclamation**

Reclamation activities prior to final reclamation will, to the extent feasible, be performed contemporaneously. Contemporaneous reclamation will be performed at the well sites following construction of the wells. Refer to Section 341 for additional details.

**353 Revegetation: General Requirements**

A vegetative cover will be established on all reclaimed areas to allow for the designated postmining land use of grazing. Refer to Section 411 for additional information.

### **353.100 Vegetative Cover**

The seed mix proposed for revegetation is intended to provide vegetative cover that will be diverse, effective, and permanent. The seed mixture was selected with respect to the climate, potential seedbed quality, erosion control, drought tolerance, and the mixture's ability for quick establishment and spreading.

**Native Species** - The reclamation vegetation mixture will be comprised of species indigenous to the area and capable of achieving the postmining land use. Diversity of species should allow utilization of plants by wildlife and domestic livestock. The recommended seed mix is comprised of native species.

**Extent of Cover** - The vegetative cover will be at least equal in extent to the cover at the designated reference areas.

**Stabilizing** - The vegetative cover mixture is capable of stabilizing the soil surfaces from erosion.

### **353.200 Reestablished Plant Species**

**Compatible** - The reestablished plant species have been selected to ensure their compatibility with the approved postmining use.

**Seasonal Characteristics** - The revegetation plant species will have the same growing season as the adjacent areas.

**Self-Generation** - The reestablished plants are species capable of self-generation and plant succession.

**Compatibility** - The seed mix suggested for revegetation contains plants native to the area and compatible with the plant and animal species of the permit area.

**Federal and Utah Laws or Regulation** - The seed mix purchased to revegetate the degassification well sites will contain no poisonous or noxious plants (see Section 234.200). No species will be introduced in the area without being approved by the Division.

**Table 3-2  
Reclamation Seed Mix**

The final reclamation seed mixture from the Centennial MRP will also be used for all interim, contemporaneous reclamation on the Gob Gas project sites and road slopes:

| <u>SPECIES</u>  | <u># PLS/acre</u> |
|---|-------------------|
| <u>Grasses:</u>   |                   |
| <u>Leymus cinereus</u><br>Great Basin Wildrye                             | 2.0               |
| <u>Agropyron spicatum</u><br>Bluebunch Wheatgrass                         | 2.0               |
| <u>Agropyron trachycaulum</u><br>Slender Wheatgrass                       | 2.0               |
| <u>Bromus inermis</u><br>Smooth Brome                                     | 3.0               |
| <u>Oryzopsis hyminoides</u><br>Indian Ricegrass                           | 2.0               |
| <u>Poa sandbergii (secunda)</u><br>Sandberg Bluegrass                     | 0.25              |
| <u>Forbs:</u>   |                   |
| <u>Artimisia ludoviciana</u><br>Louisiana Sagebrush                       | 0.1               |
| <u>Hedysarum borealis</u><br>Northern Sweetvetch                          | 1.0               |
| <u>Linum lewisii</u><br>Lewis Flax  | 1.0               |
| <u>Penstemon strictus</u><br>"Bandera" Rocky Mountain Penstemon           | 0.25              |
| <u>Shrubs:</u>  |                   |
| <u>Amelanchier alnifolia</u><br>Serviceberry                              | 1.0               |
| <u>Artemisia tridentara vaseyana</u><br>Mountain Big Sagebrush            | 0.2               |
| <u>Cercocarpus montanus</u><br>True Mountain Mahogany                     | 1.0               |
| <u>Cercocarpus ledifolius</u><br>Curleaf Mountain Mahogany                | 1.0               |
| <u>Chrysothamnus nauseosus albicaulis</u><br>Whitestem Rubber Rabbitbrush | 1.0               |
| <u>Purshia tridentata</u><br>Bitterbrush                                  | 3.0               |
| <u>Symphoricarpos oreophilus</u><br>Mountain Snowberry                    | 1.0               |
| Total   | 21.8              |

Rate is pounds Pule Live Seed per acre for drill seeding. Broadcast seeding is double the drill rate.

### **353.300 Vegetative Exception**

Andalex Resources, Inc. does not require vegetative exception at this time.

### **353.400 Cropland**

The permit area contains no land designated as cropland.

### **354 Revegetation: Timing**

Andalex Resources, Inc. will follow the recommended guidelines for revegetation and planting during the first normal period for favorable planting conditions after replacement of the topsoil. In Utah the planting period is usually Fall due to the precipitation events.

### **355 Revegetation: Mulching and Other Soil Stabilizing Practices**

Mulch and/or other soil stabilizing practices (roughing, etc.) Will be used on all areas that have been regraded and covered by topsoil (Section 341.200). Andalex, Resources, Inc. will exercise care to guard against erosion during and after application of topsoil.

### **356 Revegetation: Standards for Success**

#### **356.100 Success of Revegetation**

The success of revegetation will be judged on the effectiveness of the vegetation for postmining land use, the extent of cover on each degassification well site compared to their respective reference areas as described in Section 321 and in Attachment 3-1.

**Sampling Techniques** - Andalex Resources, Inc. will comply with the standards for success, statistically valid sampling techniques for measuring success, and the approved methods outline in the Division's "Vegetation Information Guidelines, Appendix A" for sampling.

The sampling methods to be used during reclamation will be specific to the requirements at the time of reclamation. Nonetheless, according to the currently approved UDOGM guidelines, these sampling methods would be used: sample adequacy, cover (line interception), density (belt transects or plots) and productivity (clipping). The Jaccard's Community Coefficient will be used to calculate acceptable plant similarity and diversity.

**Standards for Success** - The standards for success will include criteria representative of undisturbed lands in the area of the degas wells as means to evaluate ground cover, production and stocking of the reclaimed site.

### **356.200 Standards for Success**

Standards of success will be applied in accordance with the approved postmining land use as described in this section.

**Grazing Land and Pasture Land** - The ground cover and production of living plants on the revegetated area will be at least equal to the reference area.

**Cropland** - There is no area designated as cropland within the degassification well sites.

**Fish and Wildlife Habitat** - The postmining land use for the degas well sites will be wildlife habitat on pre-existing roads. Pre-existing roads will be returned to their approximate original contour and compacted.

**Industrial, Commercial or Residential** - The postmining land use for the permit area is not designated for industrial, commercial, or residential use.

**Previously Disturbed Areas** - N/A

### **356.300 Siltation Structures**

Siltation structures will be maintained until the disturbed areas have been stabilized and revegetated. For additional details on siltation structures, see Sections 542 and 763 of this amendment.

### **356.400 Removal of Siltation Structures**

The land on which siltation structures are located will be revegetated in accordance with the reclamation plan discussed in Section 353 and 357. Refer to Section 763 for additional information pertaining to the removal of siltation structures.

### **357 Revegetation: Extended Responsibility Period**

Andalex Resources, Inc. will be responsible for the success of revegetation for a period of 10 years following seeding of the reclaimed area or upon Diviison bond release.

### **357.100 Extended Period Begins**

The period of extended responsibility will begin after disturbed areas have been reseeded.

### **357.200 Vegetation Parameters**

Vegetation parameters will equal or exceed the approved success standard during the last 2 years of the responsibility period. The success standards are outlined in Section 356 of this application.

### **357.300 Husbandry Practices**

The use of husbandry practices are not being requested.

### **358 Protection of Fish, Wildlife, and Related Environmental Values**

Andalex Resources, Inc. will minimize disturbances and adverse impacts on wildlife and their related environments as outlined in Section 333 of the approved M&RP and Section 342 of this submittal. See Chapter 7, Section 731.100 of the approved M&RP for methods to protect water sources in the area.

#### **358.100 Existence of Endangered or Threatened Species**

The well sites will not be constructed or operated where they might jeopardize the existence of any endangered or threatened species. Refer to Section 322.200 and Attachments 3-1, 3-2 and 3-3 for additional information pertaining to threatened, endangered, and sensitive species.

State or federally listed endangered or threatened species will be reported to the Division upon its discovery.

#### **358.200 Bald and Golden Eagles**

Andalex Resources, Inc. understands that there is no permission implied by these regulations for taking of bald or golden eagles, their nest, or eggs. If found, nests will be reported to the Division.

#### **358.300 Taking of Endangered or Threatened Species**

Andalex Resources, Inc. understands that there is no permission implied by these regulations for taking of endangered or threatened species, their nest, or eggs.

#### **358.400 Replacement of Wetland or Riparian Vegetation**

The sites contain no wetland or riparian vegetation.

#### **358.500 Manmade Wildlife Protection Measure**

**Electric Power Lines** - No utilities will exist at the well sites.

**Potential Barriers** - No potential barriers will exist at any of the well sites. No ponds exist at the well sites. Refer to Section 231.100 and 242 for information pertaining to the mud pit.

**INSERT BEHIND**

**ATTACHMENT 3-1  
(VEGETATION INVENTORY)**

VEGETATION OF THE  
EMERGENCY GAS VENT HOLES:  
GVH-5B, GVH-07A, GVH-08A  
& REFERENCE AREA  
2006

FOR THE  
CENTENNIAL MINE



*Prepared by*

**MT. NEBO SCIENTIFIC, INC.**  
330 East 400 South, Suite 6  
Springville, Utah 84663  
(801) 489-6937

Patrick D. Collins, Ph.D.

*for*

**ANDALEX RESOURCES**  
Centennial Mine  
Post Office Box 902  
Price, Utah 84501



November 2006

# TABLE OF CONTENTS

|   |   |
|---|---|
| INTRODUCTION .....                          | 1 |
| METHODS .....                               | 2 |
| Photographs .....                           | 3 |
| Sensitive Species .....                     | 3 |
| RESULTS .....                               | 4 |
| GVH-05B .....                               | 4 |
| GVH-07A .....                               | 5 |
| GVH-08A .....                               | 5 |
| Threatened & Endangered Plant Species ..... | 6 |
| STUDY AREA MAP .....                        | 7 |
| COLOR PHOTOGRAPHS OF THE STUDY AREAS .....  | 9 |

## INTRODUCTION

Andalex Resources unexpectedly found it necessary to drill 3 additional boreholes in an emergency situation to vent "gob" gas as a safety procedure prior to mining the areas beneath them. Each drill site will disturb approximately one acre of land, however, the plant communities of two of the sites have been disturbed previously by other activities. The proposed new vent sites have been named and numbered: GVH-5B, GVH-7A, and GVH-8A.

Because this is more of an emergency situation in an attempt to develop more ventilation sites for mine safety conditions, pre-planning was difficult for the mine operator. Consequently, planning and development will be in-between growing seasons, so pre-disturbance collection of quantitative field data of the existing plant communities at the drill sites would have been unreliable.

In the recent past, Mt. Nebo Scientific, Inc. has sampled the vegetation of several other gob gas vent sites prior to the drilling activities necessary for development of them. Drill sites GVH-04, GVH-05A, GVH-07, GVH-08, GVH-09, and the reference areas chosen for revegetation success standards were sampled in the growing season of 2005. Additionally, quantitative data were also recorded for sites GVH-10, GVH-11, GVH-12, GVH-13, GVH-14, GVH-15, GVH-16, and GVH-17 in the growing season of 2006. Appropriate reference areas were also chosen and sampled at that time.

Because of the existing body of work from previous studies associated with the plant communities in the area, representatives from the State of Utah, Division of Oil, Gas & Mining (DOGM) and Andalex Resources met and decided that existing data may be able to represent the proposed new drill sites if so determined beforehand by field visits to them. Accordingly, these site visits were accomplished by biologists from Mt. Nebo Scientific, Inc. and DOGM prior to preparations of this report.

## METHODS

Proposed drill sites were surveyed, mapped, and staked in the field by Andalex prior to the field work performed. As mentioned above, drill sites GVH-5B, GVH-7A, and GVH-8A were visited in the field by biologists from DOGM and Mt. Nebo Scientific, Inc. This work was accomplished on November 7, 2006. At each site, dominant plant species were noted along with general physiognomy of the site. This information was used to correlate the site with similar sites that have been quantitatively sampled previously, or those areas that have been proposed or developed for other gob gas sites including the reference areas chosen for future revegetation standards. The reference areas chosen were approximately one-acre in size and have been marked in the field using a GPS instrument. The coordinates for the proposed GVH drill pads and reference areas are given below. A map showing these locations has been included in this report (see Study Area Map).

**GPS COORDINATES  
FOR CENTENNIAL MINE  
VEGETATION STUDY SITES**

| Site Name  | Community Type  | Waypoint Name | Zone | Easting (m) | Northing (m) |
|--|-----------------|---------------|------|-------------|--------------|
| GVH-05B  | Sagebrush/Grass | ANGV5B        | 12S  | 0523492     | 4398199      |
| GVH-07A  | Sagebrush/Grass | AGV07A        | 12S  | 0522404     | 4398208      |
| GVH-8A   | Sagebrush/Grass | AGVH10        | 12S  | 0521533     | 4398202      |
| Sagebrush/Grass Reference Area (lower diversity S/G) | Sagebrush/Grass | AGVHSR        | 12S  | 0522309     | 4398459      |

Photographs

Color photographs of the study areas were taken at the time of the survey and have been submitted with this report.

Sensitive Species

To initiate the previous studies in the area, appropriate agencies were consulted and other sources were reviewed (sensitive species files at *Mt. Nebo Scientific, Inc.*) for potential plant species that are known to be rare, endemic, threatened, endangered or otherwise sensitive in the study area.

## RESULTS

Below are the results of the survey for each study site in this report. Locations of these sites are shown on the Study Area Map. Color photographs of each sample site have also been provided in this document.

As mentioned in the INTRODUCTION, *other areas* had been proposed or developed before the emergency drill sites studied and described this report. Some of these sites would, or already have, impacted very similar Sagebrush/Grass plant communities as those studied here. The earlier drill sites were sampled quantitatively along with their reference areas in the growing seasons of 2005 and 2006. The Sagebrush/Grass Reference Area chosen and sampled in 2006 would be an appropriate standard for final revegetation success for all the emergency sites described herein.

Due to the critical time period for approval of the emergency sites, this report was written before completion of the final report of the other 2006 study sites. Consequently, the data set for the 2006 reference area will be submitted later in another report along with other proposed drill sites. Or, more simply stated, the data for the reference area chosen to be used for revegetation standards of the emergency sites in this report will be submitted in another final report.

### GVH-05B

The drill site for GVH-5B is located between two developed gas vent sites, GVH-5 and GVH-5A. Most of the proposed new drill site has been disturbed by roads between the other sites. The

community that existed prior to the disturbance here was Sagebrush/Grass. The new drill site may impact more of this same community on the edges of the current disturbance (see photograph).

The dominant plant species of this site were big sagebrush (*Artemisia tridentata*), Kentucky bluegrass (*Poa pratensis*), and viscid rabbitbrush (*Chrysothamnus viscidiflorus*).

#### GVH-07A

Drill site GVH-7B is located at the exact same location as GVH-7 because this site needs to be drilled again to reopen the ventilation operation. No additional disturbance to the existing plant community will be done to the site (see photograph).

The dominant plant species in this area prior to disturbance were big sagebrush, viscid rabbitbrush, Kentucky bluegrass and bluebunch wheatgrass (*Elymus spicatus*).

#### GVH-08A

The drill site for GVH-8A is the only site in the emergency drilling program that is proposed to disturb a plant community that has had no previous disturbance. This community is another Sagebrush/Grass type (see photograph). Similar plant species as mentioned above for the other sites also dominate this site.

### Threatened & Endangered Plant Species

No rare, endemic, threatened or endangered or otherwise sensitive plant species have been found in any of the previous studies in the same plant communities as the proposed new emergency sites, nor is there habitat at the new sites for the plant species that could potentially occur in the area.

STUDY AREA MAP

◦ DEADMAN CANYON, UT  
◦ 7.5 Minute Series Quadrangle Map

# UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

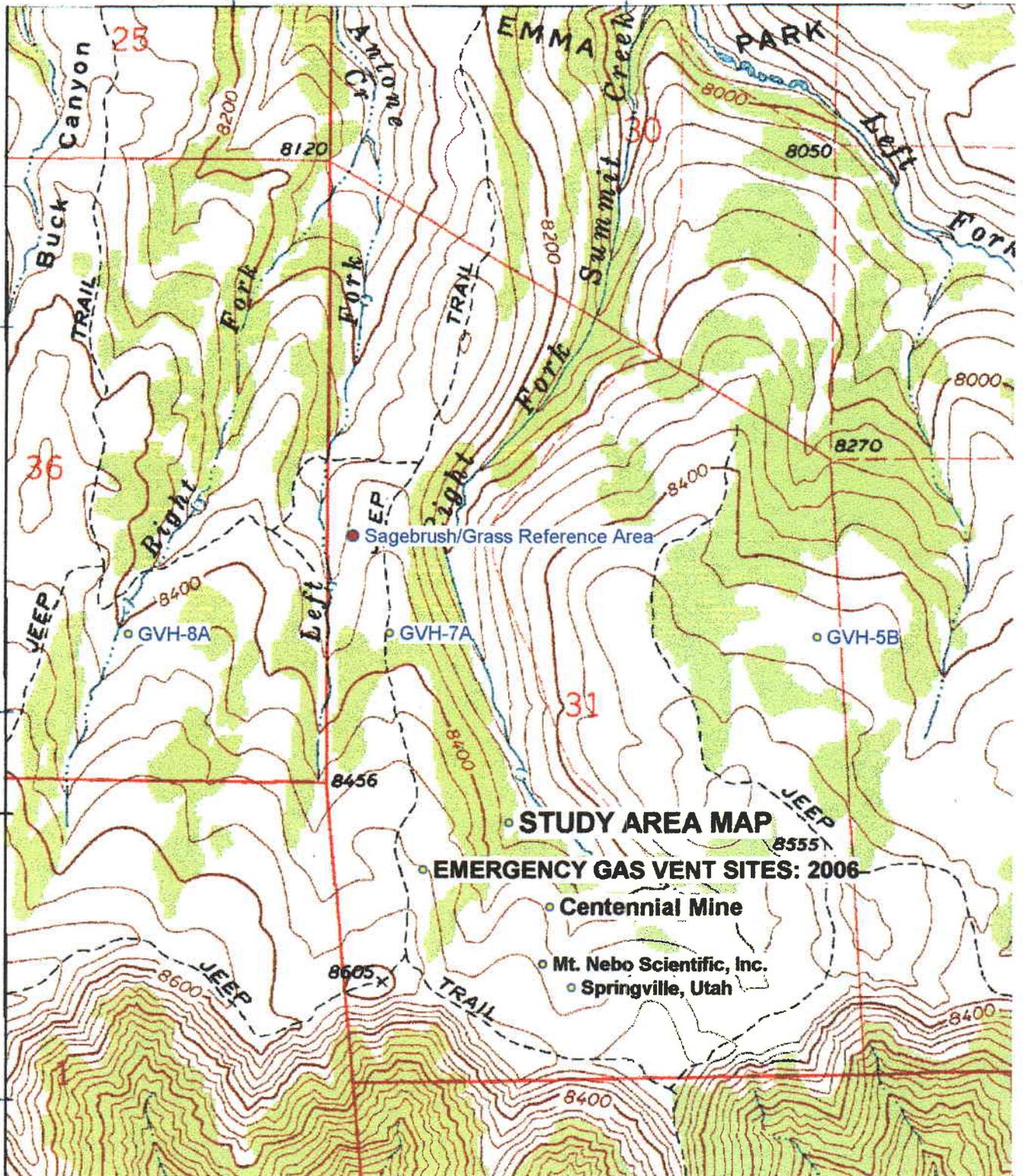
SE  
SUMMIT

110° 45'  
39° 45'

522000m.E. R 10 E R 11 E

523

4399000m.N.



4398

T 12 S

T 13 S

4397

STUDY AREA MAP

EMERGENCY GAS VENT SITES: 2006

Centennial Mine

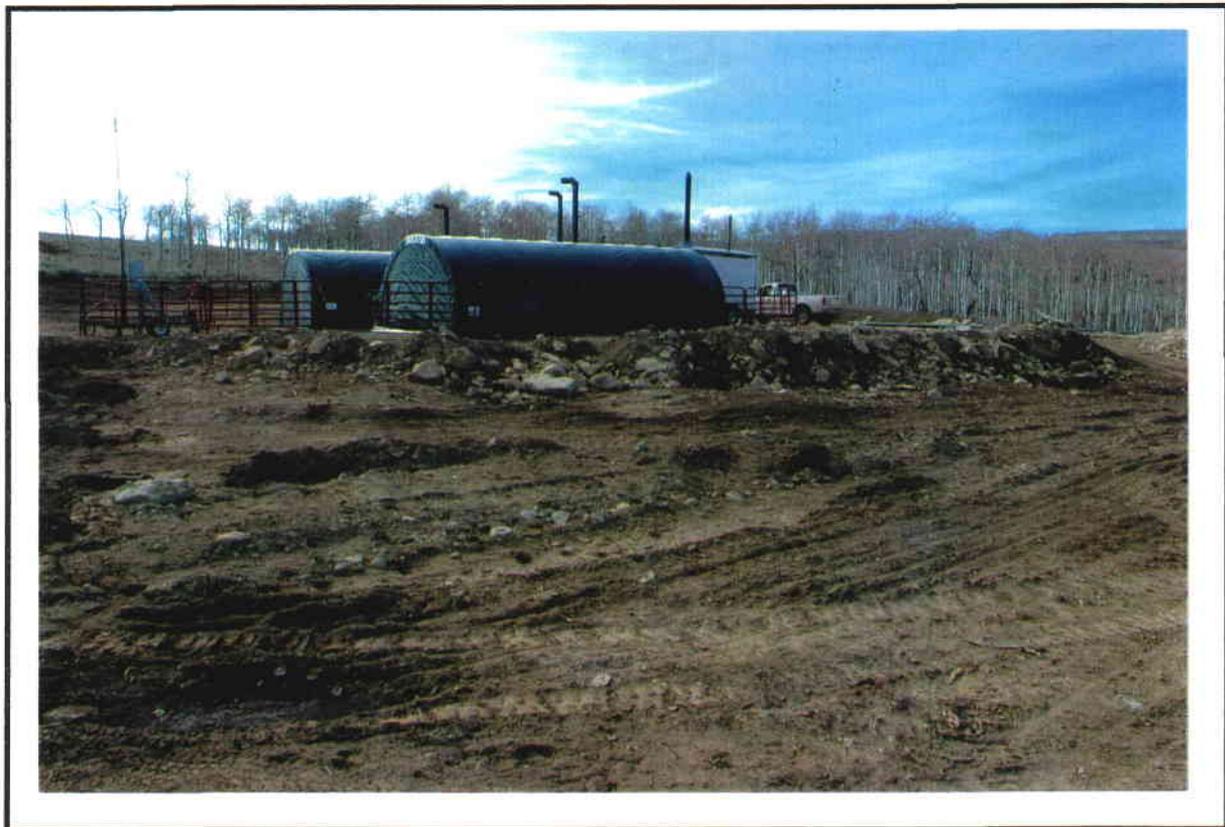
Mt. Nebo Scientific, Inc.

Springville, Utah

COLOR PHOTOGRAPHS  
OF THE  
STUDY AREAS



GVH-05B



GVH-07A



GVH-08A



Sagebrush/Grass Reference Area

(Revised)  
NOVEMBER 2006

**CHAPTER 4**  
**LAND USE AND AIR QUALITY**

## TABLE OF CONTENTS

| <u>Section</u>  | <u>Page</u> |
|---|-------------|
| <b>410 LAND USE</b> .....                                   | <b>4-1</b>  |
| <b>411 Environmental Description</b> .....                  | <b>4-1</b>  |
| 411.100 Premining Land Use .....                            | 4-1         |
| 411.110 Land Use Map and Narrative .....                    | 4-1         |
| 411.120 Land Capacity .....                                 | 4-1         |
| 411.130 Land Use Description .....                          | 4-1         |
| 411.140 Cultural and Historic Resources Information .....   | 4-1         |
| 411.200 Previous Mining Activity .....                      | 4-2         |
| <b>412 Reclamation Plan</b> .....                           | <b>4-2</b>  |
| 412.100 Postmining Land-Use Plan .....                      | 4-2         |
| 412.200 Land Owner or Surface Manager Comments .....        | 4-2         |
| <b>413 Performance Standards</b> .....                      | <b>4-2</b>  |
| 413.100 Postmining Land Use .....                           | 4-2         |
| 413.200 Determining Premining Uses of Land .....            | 4-2         |
| 413.300 Criteria for Alternative Postmining Land Uses ..... | 4-3         |
| <b>414 Alternate Land Use</b> .....                         | <b>4-3</b>  |
| <b>420 AIR QUALITY</b> .....                                | <b>4-3</b>  |
| <b>421 Air Quality</b> .....                                | <b>4-3</b>  |
| <b>422 Compliance Efforts</b> .....                         | <b>4-3</b>  |
| <b>423 Monitoring Program</b> .....                         | <b>4-3</b>  |
| <b>424 Fugitive Dust Control Plan</b> .....                 | <b>4-3</b>  |
| <b>425 Additional Division Requirements</b> .....           | <b>4-3</b>  |

## LIST OF ATTACHMENTS

**Attachment 4-1** Cultural Resource Survey and Inventory  
**Attachment 4-2** Surface Land Owner Notification (Moved to Confidential Binder)

## **410 LAND USE**

### **411 Environmental Description**

A statement of the conditions and capabilities of the land to be affected by mining and reclamation operations follows in this section.

#### **411.100 Premining Land Use**

The area is utilized for the landowners private use, including hunting and as open range for livestock and wildlife.

#### **411.110 Land Use Map and Narrative**

Refer to the same section of the approved M&RP.

#### **411.120 Land Capability**

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.

#### **411.130 Land Use Description**

The wells are located on land administered by Dave R. & Mildred Cave, et al., and Mathis Land, Inc. and zoned by Carbon County for mining and grazing (MG-1).

No industrial or municipal facilities are located on or immediately adjacent to the well sites.

#### **411.140 Cultural and Historic Resources Information**

Archeological surveys will be conducted on any future proposed well sites as soon as weather and ground conditions allow. The Cultural Resource Survey will be included in Attachment 4-1 of this application. For Gob Gas Holes 1, 3, 4, 5 and 6, preliminary research and file search has been conducted by Senco-Phenix of Price, Utah and the research indicates that there is a very low probability of the occurrence of cultural resources at the proposed drill sites. Senco-Phenix has also completed a Cultural Resource Survey of the approved sites GVH#5A, GVH#7, GVH#8 and GVH#9, and the proposed sites GVH#5B and GVH #8A. (GVH #7A will be a re-drill on the existing disturbed pad of GVH #7, which has been previously surveyed for archeological resources.) Results of these surveys are included in Attachment 4-1. (Confidential Binder)

Andalex Resources, Inc. agrees to notify the Division and State Historical Preservation Office (SHPO) of previously unidentified cultural resources discovered in the course of operations. Andalex also agrees to have any such cultural resources evaluated in terms of NRHP eligibility criteria. Protection of eligible cultural resources will be in accordance with Division and SHPO requirements. Andalex will also instruct its employees that it is a violation of federal and state law to collect individual artifacts or to otherwise disturb cultural resources.

#### **411.200 Previous Mining Activity**

Andalex Resource, Inc. has no knowledge of the removal of coal or other minerals in the well site areas.

### **412 Reclamation Plan**

#### **412.100 Postmining Land-Use Plan**

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 Resource, Inc. intends the postmining 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 to parallel the premining land use.

#### **412.200 Land Owner or Surface Manager Comments**

Surface lands are owned by Dave R. & Mildred Cave, et al., and Mathis Land, Inc. Appropriate landowner approvals have been obtained for the proposed wells. Required notification of drilling will be sent to the landowners prior to start. Copies of the notification letters have been included in Attachment 4-2.

### **413 Performance Standards**

#### **413.100 Postmining Land Use**

Postmining land uses are discussed in Section 412.100. The postmining lands will be reclaimed in a timely manner and capable of supporting such uses (see Chapters 2, 3, 5 and 7).

#### **413.200 Determining Premining Uses of Land**

Refer to Section 411.100.

### **413.300 Criteria for Alternative Postmining Land Use**

No alternative postmining land uses have been planned.

#### **414 Alternative Land Use**

No alternative postmining land uses have been planned.

### **420 AIR QUALITY**

#### **421 Air Quality Standards**

Gas vent hole activities will be conducted in compliance with the requirements of the Federal Clean Air Act and the Utah Air Conservation Rules.

#### **422 Compliance Efforts**

See Fugitive Dust Control Plan, Section 424.

#### **423 Monitoring Program**

Refer to the same section in the approved M&RP.

#### **424 Fugitive Dust Control Plan**

Operational areas that are used by mobile equipment will be water sprayed to control fugitive dust. 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.

#### **425 Additional Division Requirements**

Refer to the same section of the approved M&RP.

**ATTACHMENT 4-1**  
**CULTURAL RESOURCE SURVEY**  
(Relocated to Confidential Binder)

**ATTACHMENT 4-2  
SURFACE LAND OWNER NOTIFICATION**

The surface owner land use agreement is also on file at the Carbon County Recorder's office in Price, Utah

**INSERT BEHIND**

**ATTACHMENT 4-1**

*See Confidential File*

**(Revised)**  
**NOVEMBER 2006**

**CHAPTER 5**  
**ENGINEERING**

## TABLE OF CONTENTS

| <u>Section</u>  | <u>Page</u> |
|---|-------------|
| <b>510 INTRODUCTION</b> .....   | 5-1         |
| <b>511 General Requirements</b> .....   | 5-1         |
| <b>512 Certification</b> .....  | 5-1         |
| 512.100 Cross Sections and Maps .....   | 5-1         |
| 512.200 Plans and Engineering Designs .....   | 5-1         |
| <b>513 Compliance with MSHA Regulations and MSHA Approval</b> .....                     | 5-2         |
| 513.100 Coal Processing Waste Dams and Embankments .....                                | 5-2         |
| 513.200 Impoundments and Sedimentation Ponds .....                                      | 5-2         |
| 513.300 Underground Development Waste, coal Processing Waste,<br>and Excess Spoil ..... | 5-2         |
| 513.400 Refuse Piles .....  | 5-2         |
| 513.500 Underground Openings to the Surface .....                                       | 5-2         |
| 513.600 Discharge to Underground Mine .....   | 5-2         |
| 513.700 Surface Coal Mining and Reclamation Activities .....                            | 5-2         |
| 513.800 Coal Mine Waste Fire .....  | 5-2         |
| <b>514 Inspection</b> .....   | 5-3         |
| 514.100 Excess Spoil .....  | 5-3         |
| 514.200 Refuse Piles .....  | 5-3         |
| 514.300 Impoundments .....  | 5-3         |
| <b>515 Reporting and Emergency Procedures</b> .....                                     | 5-3         |
| 515.100 Slides .....  | 5-3         |
| 515.200 Impoundments Hazards .....  | 5-3         |
| 515.300 Temporary Cessation of Operations .....   | 5-3         |
| <b>520 OPERATION PLAN</b> .....   | 5-3         |
| <b>521 General</b> .....  | 5-3         |
| 521.100 Cross Sections and Maps .....   | 5-3         |
| 521.200 Signs and Markers .....   | 5-4         |

## TABLE OF CONTENTS (Continued)

| <u>Section</u>  | <u>Page</u> |
|---|-------------|
| 522 Coal Recovery .....   | 5-4         |
| 523 Mining Methods .....  | 5-4         |
| 524 Blasting and Explosives .....   | 5-5         |
| 525 Subsidence .....  | 5-5         |
| 526 Mine Facilities .....   | 5-5         |
| 526.100 Mine Structures and Facilities .....                                  | 5-5         |
| 526.200 Utility installation and Support Facilities .....                     | 5-5         |
| 527 Transportation Facilities .....   | 5-5         |
| 527.100 Road Classification .....   | 5-5         |
| 527.200 Description of Transportation Facilities .....                        | 5-5         |
| 528 Handling and Disposal of Coal, Excess Spoil, and Coal Mine<br>Waste ..... | 5-6         |
| 529 Management of Mine Openings .....   | 5-6         |
| 530 OPERATIONAL DESIGN CRITERIA AND PLANS .....                               | 5-6         |
| 531 General .....   | 5-6         |
| 532 Sediment Control .....  | 5-6         |
| 533 Impoundments .....  | 5-6         |
| 534 Roads .....   | 5-6         |
| 535 Spoil .....   | 5-7         |
| 536 Coal Mine Waste .....   | 5-7         |
| 537 Regraded Slopes .....   | 5-7         |
| 537.100 Division Approval .....   | 5-7         |

## TABLE OF CONTENTS (Continued)

| <u>Section</u>  | <u>Page</u> |
|---|-------------|
| 537.200 Regrading of Settled and Revegetative Fills .....                             | 5-7         |
| <b>540 RECLAMATION PLAN .....</b>   | <b>5-7</b>  |
| <b>541 General .....</b>  | <b>5-7</b>  |
| 541.100 Commitment .....  | 5-7         |
| 541.200 Surface Coal Mining and Reclamation .....                                     | 5-7         |
| 541.300 Underground Coal Mining and Reclamation Activities .....                      | 5-7         |
| 541.400 Environmental Protection Performance Standards .....                          | 5-7         |
| <b>542 Narratives, Maps, and Plans .....</b>  | <b>5-8</b>  |
| 542.100 Reclamation Timetable .....   | 5-8         |
| 542.200 Plan for Backfilling, Soil Stabilization, Compacting,<br>and Grading .....    | 5-8         |
| 542.300 Final Surface Configuration Maps and Cross Sections .....                     | 5-8         |
| 542.400 Removal of Temporary Structures .....   | 5-8         |
| 542.500 Removal of Sedimentation Pond .....   | 5-8         |
| 542.600 Roads .....   | 5-8         |
| 542.700 Final Abandonment of Mine Openings and Disposal Areas ..                      | 5-8         |
| 542.800 Estimated Cost of Reclamation .....   | 5-9         |
| <b>550 RECLAMATION DESIGN CRITERIA AND PLANS .....</b>                                | <b>5-9</b>  |
| <b>551 Casting and Sealing of Underground Openings .....</b>                          | <b>5-9</b>  |
| <b>552 Permanent Features .....</b>   | <b>5-9</b>  |
| 552.100 Small Depressions .....   | 5-9         |
| 552.200 Permanent Impoundments .....  | 5-9         |
| <b>553 Backfilling and Grading .....</b>  | <b>5-9</b>  |
| 553.100 Disturbed Area Backfilling and Grading .....                                  | 5-9         |
| 553.200 Spoil and Waste .....   | 5-9         |
| 553.250 Refuse Piles .....  | 5-10        |
| 553.300 Exposed Coal Seams, Acid and Toxic Forming Materials<br>and Combustible ..... | 5-10        |
| 553.400 Cut and Fill Terraces .....   | 5-10        |

## TABLE OF CONTENTS (Continued)

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| 553.500 Highwall From Previously Mined Areas . . . . .       | 5-10        |
| 553.600 Previously Mined Areas . . . . .                     | 5-10        |
| 553.700 Backfilling and Grading - Thin Overburden . . . . .  | 5-10        |
| 553.800 Backfilling and Grading - Thick Overburden . . . . . | 5-10        |
| 553.900 Regrading of Settled and Revegetated Fills . . . . . | 5-10        |
| <b>560 PERFORMANCE STANDARDS . . . . .</b>                   | <b>5-10</b> |

### LIST OF FIGURES

|                    |  |
|--------------------|--|
| <b>Figure 5-1</b>  | Typical Gob Gas Vent Hole Drilling Plan          |
| <b>Figure 5-2</b>  | Typical Gob Gas Vent Hole Operation Plan         |
| <b>Figure 5-3</b>  | Typical Gob Gas Vent Hole Pad Cross Section      |
| <b>Figure 5-4</b>  | Typical Gob Gas Vent Hole                        |
| <b>Figure 5-5</b>  | Typical Road Cross Sections                      |
| <b>Figure 5-6</b>  | Projected Gob Gas Vent Hole Reclamation Schedule |
| <b>Figure 5-7</b>  | GVH #1 - As-Constructed                          |
| <b>Figure 5-8</b>  | GVH #3 - As-Constructed                          |
| <b>Figure 5-9</b>  | GVH #4 - As-Constructed                          |
| <b>Figure 5-10</b> | GVH #5 - As-Constructed                          |
| <b>Figure 5-11</b> | GVH #6 - As-Constructed                          |
| <b>Figure 5-12</b> | GVH #5A - As-Constructed                         |
| <b>Figure 5-13</b> | GVH #7 - As-Constructed                          |
| <b>Figure 5-14</b> | GVH #8 - As-Constructed                          |
| <b>Figure 5-15</b> | GVH #9 - As-Constructed                          |

## **510 INTRODUCTION**

This chapter provides a discussion of general engineering aspects, an operation plan, a reclamation plan, design criteria, and performance standards related to the degassification well sites. The activities associated with the construction and reclamation of the well sites have been or will be designed, located, constructed, maintained, and reclaimed in accordance with the operation and reclamation plans.

Designs and other information herein presented will be of a general nature or in the form of typicals, since the proposed sites are not yet accessible for detailed surveying or studies. Site specific information will be provided in this chapter as it becomes available.

### **511 General Requirements**

The permit application includes descriptions of construction, maintenance, and reclamation operations of the proposed well sites with maps and plans. Potential environmental impact as well as methods and calculations utilized to achieve compliance with the design criteria are also presented.

### **512 Certification**

Where required by the regulations, cross sections and maps in this permit application have been prepared by or under the direction of, and certified by, qualified registered professional engineers or land surveyors. As appropriate, these persons were assisted by experts in the fields of hydrology, geology, biology, etc.

#### **512.100 Cross Sections and Maps**

Cross sections for the degassification well pads will be provided upon completion of surveys. Typical road cross sections are shown on Figures 5-5.

#### **512.200 Plans and Engineering Designs**

**Excess Spoil** - No excess spoil will be generated from the well sites.

**Durable Rock Fills** - No durable rock fills will exist at the well sites.

**Coal Mine Waste** - No coal mine waste will exist at the well sites.

**Impoundments** - Refer to Section 733.200 of this submittal.

**Ancillary Roads** - Short sections of road may be required to access certain well sites. Topsoil will be stripped from the road alignment and stored with the topsoil stripped from the pad area prior to grading the new access road. When possible, well sites will be placed on existing roads.

As shown on Figure 1-1, proposed GVH sites 5B, 7A and 8A are located on existing access roads.

**Variance from Approximate Original Contour** - No variance from approximate original contour is required for the well sites.

**513 Compliance with MSHA Regulations and MSHA Approval**

**513.100 Coal Processing Waste Dams and Embankments**

No coal processing waste dams and embankments will exist at the well sites.

**513.200 Impoundments and Sedimentation Ponds**

Refer to Section 733.200 of this submittal.

**513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil**

No underground waste, coal processing waste, and excess spoil will exist at the well sites.

**513.400 Refuse Piles**

No refuse piles will exist at the well sites.

**513.500 Underground Openings to the Surface**

The well will be equipped with a valve that will be closed and locked when not in use. A typical well head is shown in Figure 5-4.

**513.600 Discharge to Underground Mine**

No discharge to the underground mine will occur at the well sites.

**513.700 Surface Coal Mining and Reclamation Activities**

No surface coal mining, or reclamation activities associated with surface coal mining will occur at the well sites.

**513.800 Coal Mine Waste Fire**

No coal waste will be developed, therefore, no coal waste fires will occur at the well sites.

## **514 Inspection**

### **514.100 Excess Spoil**

No excess spoil will be stored at the well sites.

### **514.200 Refuse Piles**

No refuse piles will exist at the well sites.

### **514.300 Impoundments**

Refer to Section 7133.200 of this submittal.

## **515 Reporting and Emergency Procedures**

### **515.100 Slides**

Refer to Section 515.100 in the approved M&RP.

### **515.200 Impoundment Hazards**

No impoundments will exist at the well sites.

### **515.300 Temporary Cessation of Operations**

If temporary cessation of the mining operations does occur, the wells will remain open. Once liberation of the gob gas is completed, the wells will be sealed as discussed in Section 542.700 of this submittal.

## **520 OPERATION PLAN**

### **521 General**

Detailed maps will be provided of each of the well sites when conditions allow access.

### **521.100 Cross Sections and Maps**

**Existing Surface and Subsurface Facilities Features** - No buildings are located on or within 1,000 feet of any of the well sites.

**Landowner, Right-of-Entry, and Public Interest** - The land which the wells will be drilled on is owned by Dave R. & Mildred Cave, et al., and Mathis Land, Inc. Andalex Resources, Inc. will complete landowner agreements to allow access for the construction and drilling

of the wells (see Attachment 4-2).

**Mining Sequence and Planned Subsidence** - Refer to Section 525.

**Land Surface Configuration** - Surface contours of undisturbed well sites will be included when completed.

**Surface Facilities** - No permanent surface facilities will exist at the well sites.

### **521.200 Signs and Markers**

**Mine and Permit Identification Signs** - A mine and permit identification sign will be displayed at each well site. This sign will be a design that can be easily seen and read, will be made of durable material, will conform to local regulation, and will be maintained until after the release of all bonds for the well site areas. The sign will contain the following information:

- Mine name,
- Company name,
- Company address and telephone number,
- MSHA identification number, and
- Permanent program permit identification number

**Perimeter Markers** - The perimeter of all areas affected will be clearly marked before beginning drilling activities. The markers will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area.

**Buffer Zone Markers** - Stream buffer zone markers will not be required at any of the well sites.

**Topsoil Markers** - Markers will be placed on all topsoil stockpiles. These markers will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until topsoil is redistributed on the well sites.

**Construction Markers** - Not applicable.

### **522 Coal Recovery**

No coal recovery will be performed at the well sites.

### **523 Mining Methods**

No mining will be performed at the well sites.

## **524 Blasting and Explosives**

No explosives are to be used at the well sites.

## **525 Subsidence**

No subsidence will occur at the well sites, as a result of drilling and development of the degassification well sites. Subsidence could occur at the well site because of underground mining see Section 525 of the approved M&RP.

## **526 Mine Facilities**

### **526.100 Mine Structures and Facilities**

No buildings exist or are proposed at the well sites; therefore, no existing building will be used in connection with or to facilitate this proposed coal mining and reclamation plan.

### **526.200 Utility and Support Facilities**

No utilities are to be installed at the well sites. A portable exhaust unit will be temporarily installed to draw gob gas to the surface from the mined panel. The exhaust blower will be started by using propane from portable tanks. Once started and running, the unit will be powered by burning the extracted gas. Excess gob gas will be vented to the atmosphere. The blower is approximately 12-feet long by 6-feet wide and about 10-feet tall. It is not known how long the degassification of the longwall panel will take.

## **527 Transportation Facilities**

### **527.100 Road Classification**

Well sites will be developed near existing private roads whenever possible. The new access roads will be classified as ancillary roads and will be maintained by the permittee.

### **527.200 Description of Transportation Facilities**

The well sites have been chosen close to existing roads whenever possible in the area to limit surface disturbance. The existing roads were constructed and are maintained by the land owner. The existing roads are approximately 16 feet wide. See Figure 5-5 for a typical cross section of the existing roads.

The following is a description of each of the roads used to access the GVH Sites:

Right Fork of Deadman Canyon - This road is located in the bottom of Deadman Canyon north of the Centennial Project Minesite surface facilities. The road was existing,

constructed by the surface owner; however, it did require minor drainage control upgrades in the form of 18" and 24" culverts, and slight widening of sharp turns for drilling equipment access. This road is approximately 12,300' long with an average slope of 11.79% and is approximately 16' wide. The road runs from the Centennial Minesite to the top of the ridge. The road is native rock and gravel surfaced, and is protected from runoff by a combination of berms, road ditches and culverts. This road will remain in place upon completion of the drilling project.

GVH-5 - This road runs from the top of Deadman Canyon to the GVH-5 Site. This is an existing road, approximately 16' wide, 4400' in length, with an average slope of approximately 5.00%. The road is constructed on native material and protected from runoff by berms, ditches and culverts as needed.. There are no plans to remove or reclaim this road.

GVH-5A - This road was constructed from GVH-5 west approximately 800' to GVH-5A. The road is approximately 16' wide with a slight slope to the pad.

GVH-5B - This site is located approximately ½ way between GVH-5 and GVH-5A and is on the existing road to GVH-5A. The newly constructed OSO Energy pipeline and associated disturbance also runs through this site.

GVH-1 - This is a short section of road running from Road GVH-5 to the GVH-1 Site. The road was constructed on native material by ARI, and is approximately 16' wide, 300' in length and has an average slope of 3.33%. The drainage is controlled by ditches and berms, with runoff retained on the pad. This road will be removed and reclaimed unless requested otherwise by the landowner.

GVH-6 - This is a constructed access road running from Road GVH-5 to the GVH-6 Site. The road is approximately 16' wide, 4300' long and has an average slope of 2.67%. It is constructed on native material, with gravel used as needed on soft areas. Drainage is controlled by a combination of ditches and berms. This road will be removed and reclaimed unless otherwise directed by the landowner.

Ridge Road - This is an existing road along the ridge above the Right and Left Forks of Deadman Canyon. The road is approximately 16' wide, 7100' long and has an average grade of 3.10%. It runs westward from the top of the Right Fork of Deadman Canyon to the turnoff to the road to GVH-9. The road is constructed on native material and being on the ridgeline, has need for only minimal drainage control in the form of ditches where needed. This road will remain in place after the project is completed.

GVH-3 - This is an existing road from the Ridge Road to the GVH-3 Site. The road is approximately 16' wide, 1200' long and has an average grade of 4.17%. The road is constructed on native material and hydrologic controls consist of berms and ditches. This road is not scheduled for removal after the project is completed.

GVH-7 - This section of road is from GVH-3 to GVH-7 and is a continuation of the existing road to GVH-3. This section is approximately 16' wide, 1600' long and at an average grade of 8.13%. The road is constructed on native material and hydrologic controls are primarily from ditches. This road is also scheduled to remain after the project.

GVH-7A - This site will be a re-drill of existing site GVH-7, and will use the existing access road to GVH-7.

GVH-8 - This road is from GVH-4 to GVH-8. The road is approximately 16' wide, 1700' long and at an average grade of 8.0%. The road is on native material and hydrologic controls are primarily from ditches.

GVH-8A - This is an existing road from the area of GVH-9 eastward into the draw between GVH-8 and GVH-9. The road is approximately 16' wide and has an average grade of approximately 8.5%. The road is constructed on native material with runoff control primarily by ditches.

GVH-4 - This road runs from the Ridge Road to the GVH-4 Site. This road was constructed by ARI, and is approximately 16' wide, 1100' long at an average grade of approximately 3.64%. The road was constructed on native material, and runoff is controlled by ditches and berms with containment on the pad. This road will be removed and reclaimed unless otherwise requested by the landowner.

GVH-9 - This is an existing road from the Ridge Road to the GVH-9 Site. The road is approximately 16' wide, 3500' long and has an average grade of approximately 8.14%. The road is constructed on native material and runoff is controlled by ditches and berms. Since this is also an existing road, it will not be removed unless requested by the landowner.

All roads described above are shown on Figure 1-1 of this Appendix.

## **528 Handling and Disposal of Coal, Excess Spoil, and Coal Mine Waste**

No disposal of coal, excess spoil, and coal mine waste will occur at the well sites.

## **529 Management of Mine Openings**

The perimeter of the sites, including the topsoil stockpiles will be fenced with gates on the access roads. The well casing will have a valve that is closed and locked. The valve will also prevent access by animals or other material. Mine openings will be monitored in accordance with Federal and State Regulations.

During the life of the wells, the sites will be inspected as needed by mine personnel to verify the continued operation of the pumping equipment and general site conditions.

## **530 OPERATIONAL DESIGN CRITERIA AND PLANS**

### **531 General**

This section contains the general plans for the construction of sediment controls and general construction and maintenance of the well sites.

The decision to construct each well will be based on the amount of gas encountered during mining. If small amounts of gas are encountered and the mine's ventilation system can dilute the gob gas, no well will be drilled. The proposed well site locations are shown on Figure 1-1.

### **532 Sediment Control**

Sediment control measures for the well sites are described in Sections 732 and 742 of this submittal. Runoff control structures at the well sites have been designed to convey runoff in a non-erosive manner. Sediment yields in the well permit area are minimized by:

- Disturbing the smallest practicable area during the construction of the well site and
- Contemporaneously reclaiming areas suitable for such reclamation.

### **533 Impoundments**

No impoundments will exist at the well sites.

### **534 Roads**

Refer to Section 527 of this submittal.

**535 Spoil**

No spoil will be generated at the well sites.

**536 Coal Mine Waste**

No coal mine waste will be stored at the well sites.

**537 Regraded Slopes**

**537.100 Division Approval**

No mining or reclamation activities will be conducted in the permit area that requires approval of the Division for alternative specifications or for steep cut slopes.

**537.200 Regrading of Settled and Revegetated Fills**

Upon completion of the well site, the areas not required for the exhaust blower will be regraded to approximate original contour. Because of the nature of the well site, settling is not anticipated. However, if settlement does occur, these areas will be regraded.

**540 RECLAMATION PLAN**

**541 General**

**541.100 Commitment**

Upon the permanent cessation of gob gas venting, Andalex Resources, inc. permanently reclaim all affected areas in accordance with the R645 regulations and this reclamation plan.

**541.200 Surface Coal Mining and Reclamation Activities**

Not applicable.

**541.300 Underground Coal Mining and Reclamation Activities**

Upon completion of the gob gas venting activities the wells will be reclaimed.

**541.400 Environmental Protection Performance Standards**

The plan presented is designed to meet the requirements of R645-301 and the environmental protection performance standards of the State Program.

## **542 Narratives, Maps, and Plans**

### **542.100 Reclamation Timetable**

A general timetable for the completion of each major step in the reclamation plan is presented in Figure 5-6.

### **542.200 Plan for Backfilling, Soil Stabilization, Compacting, and Grading**

Following completion of the venting activities, the well site will be prepared for contouring and soil distribution. Details regarding topsoil placement and revegetation are provided in Section 242 and Section 353, respectively.

**Sedimentation Pond Removal and Interim Sediment Control** - See Section 542.500 of this submittal.

### **542.300 Final Surface Configuration Maps and Cross Sections**

The sites will be regraded to the approximate original contour, the contours representing the pre-disturbance topography also represent the reclamation topography. Cross sections representing the final surface configuration will be included upon completion.

### **542.400 Removal of Temporary Structures**

The well sites will not have surface structures.

### **542.500 Removal of Sedimentation Pond**

No sedimentation pond will be constructed at the well sites.

### **542.600 Roads**

The roads which existed prior to the drilling program will be retained after reclamation. The access roads established during the drilling program will be reclaimed after gob gas extraction has been completed. See Section 242 for additional detail concerning the reclamation plan.

### **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 final reclamation is completed.

## **542.800 Estimated Cost of Reclamation**

Refer to Appendix B of the existing M&RP. It is anticipated that the cost of reclamation of the well sites is adequately covered by the Centennial Project Reclamation Bond. Refer to Chapter 8 for additional detail.

## **550 RECLAMATION DESIGN CRITERIA AND PLANS**

### **551 Casing and Sealing of Underground Openings**

Permanent sealing is described in Section 542.700.

### **552 Permanent Features**

#### **552.100 Small Depressions**

No permanent small depressions will be created as part of the well site construction and reclamation.

#### **552.200 Permanent Impoundments**

See Section 515.200 of this submittal.

### **553 Backfilling and Grading**

#### **553.100 Disturbed Area Backfilling and Grading**

**Approximate Original Contour** - The well sites will be returned to their approximate original contour after reclamation is completed.

**Erosion and Water Pollution** - 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.

**Post-Mining Land Use** - The disturbed area will be reclaimed in a manner that supports the approved post-mining land use. Refer to Section 411 and 412 for additional detail.

#### **553.200 Spoil and Waste**

**Spoil** - No Spoil will be generated within the well sites.

**Coal Processing Waste** - No coal processing waste will be generated within the well sites.

### **553.250 Refuse Piles**

No refuse piles will exist at the well sites.

### **553.300 Exposed Coal Seams, Acid and Toxic Forming Materials and Combustible Materials**

No coal seams will be left exposed at the well sites. All wells will be sealed according to Federal and State regulations.

### **553.400 Cut and Fill Terraces**

No cut and fill terraces will be constructed at the well sites.

### **553.500 Highwall From Previously Mined Areas**

No highwalls exist or will be built at the well sites.

### **553.600 Previously Mined Area**

No previously mined areas exist at the well sites.

### **553.700 Backfilling and Grading - Thin Overburden**

No surface mining and reclamation activities involving thin overburden will occur at the well sites.

### **553.800 Backfilling and Grading - Thick Overburden**

No surface mining and reclamation activities involving thick overburden will occur at the well sites.

### **553.900 Regrading of Settled and Revegetated Rills**

If settlement or rills occur at the well sites, they will be regraded and revegetated. Refer to Section 244.300.

## **560 PERFORMANCE STANDARDS**

Performance of the well sites will be conducted in accordance with the approved permit and the requirements of R645-301-510 through R645-301-553.

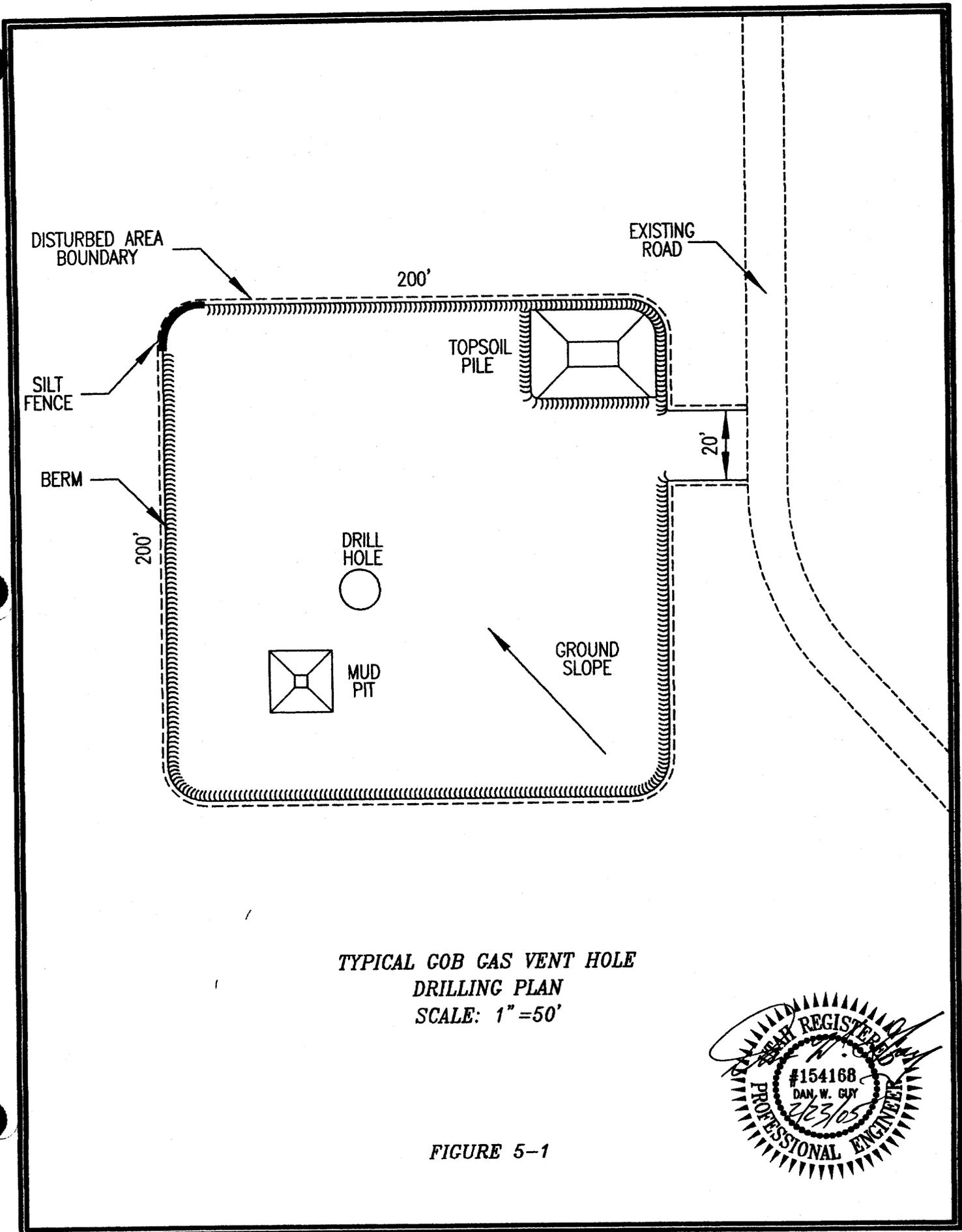
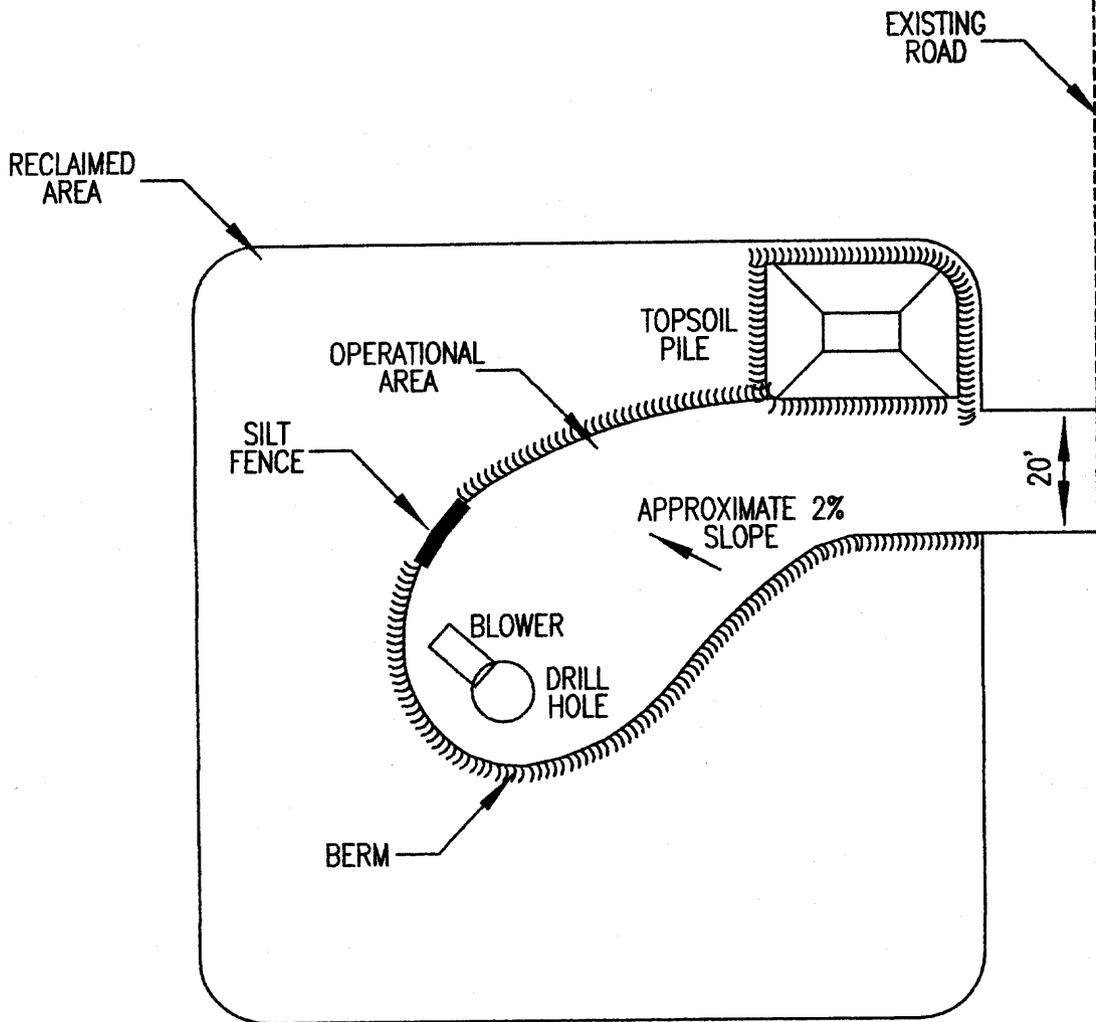


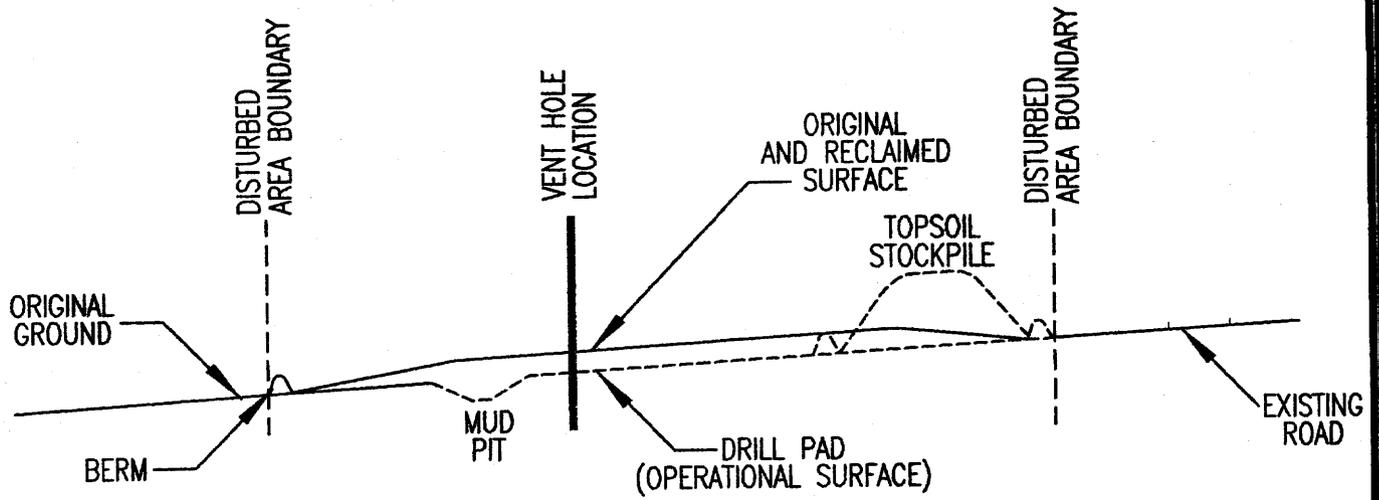
FIGURE 5-1



TYPICAL COB GAS VENT HOLE  
 OPERATIONAL PLAN  
 SCALE: 1" = 50'



FIGURE 5-2



TYPICAL COB GAS VENT HOLE  
 PAD CROSS SECTION  
 SCALE: 1" = 50'



FIGURE 5-3

TYPICAL GOB GAS VENT HOLE

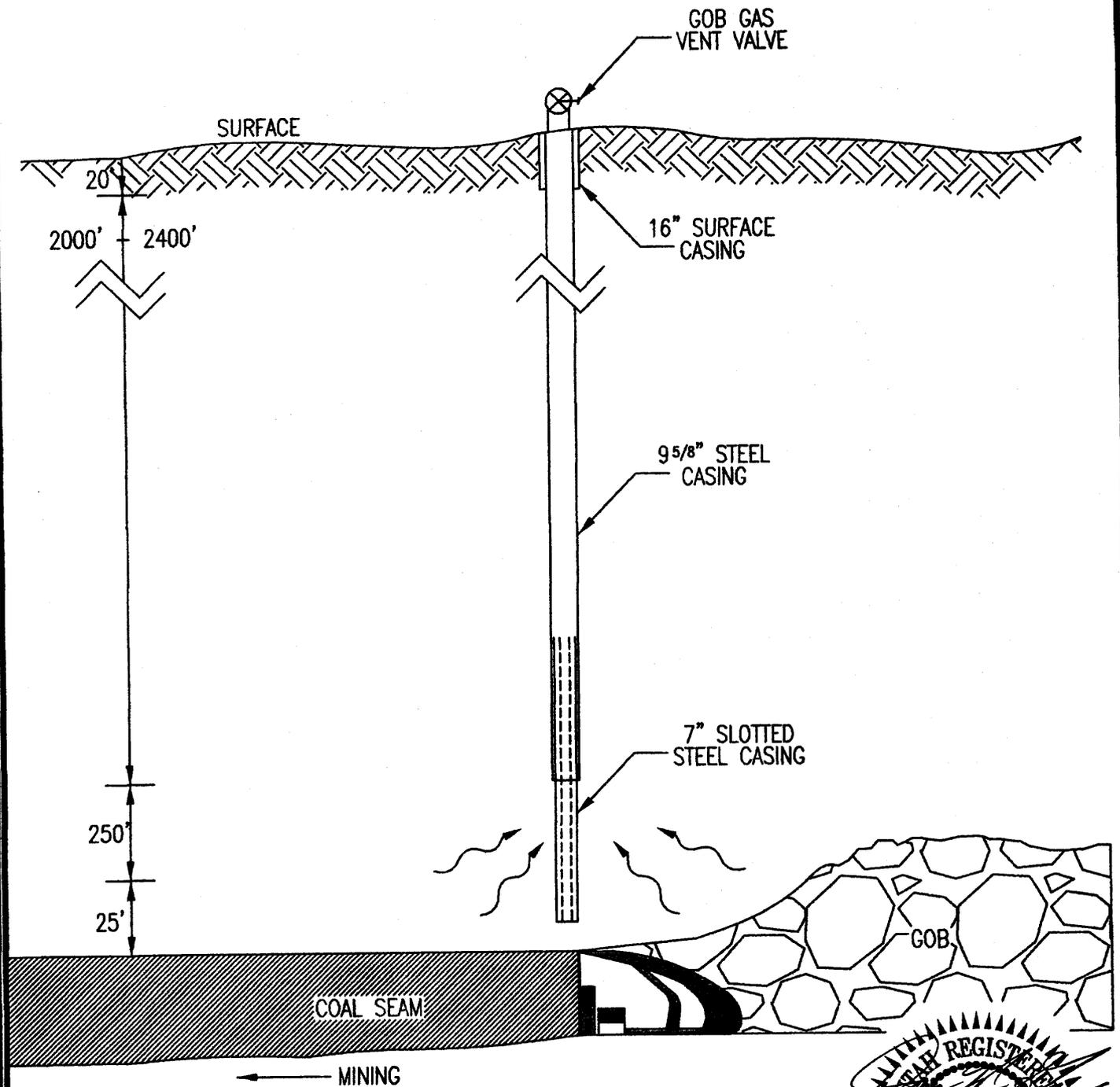


FIGURE 5-4



TYPICAL ROAD  
CROSS SECTIONS

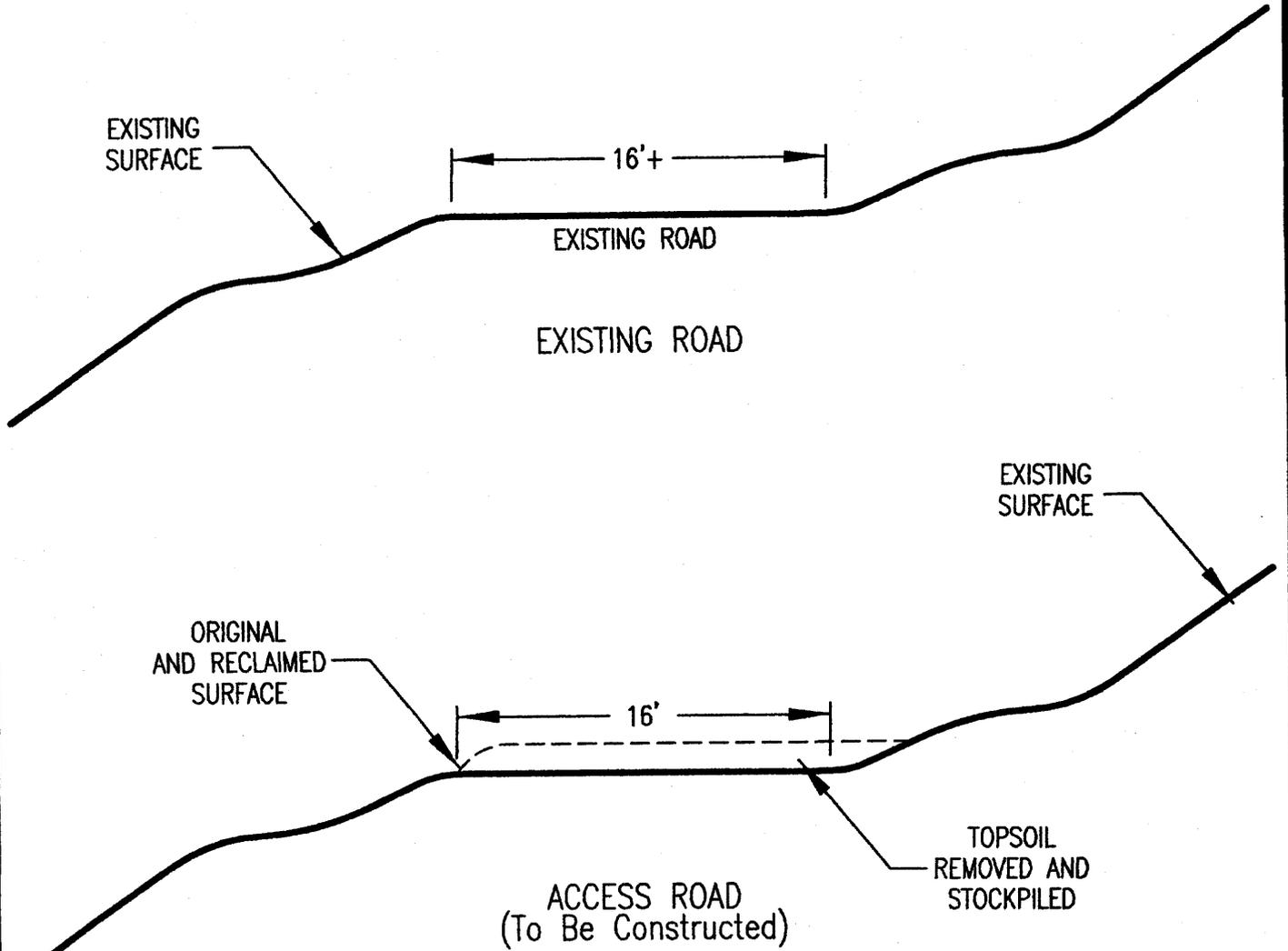


FIGURE 5-5



**PROJECTED GOB GAS VENT HOLE  
RECLAMATION SCHEDULE**

---

**\* CONTEMPORANEOUS RECLAMATION**

|  |        |
|--|--------|
| 1- Regrading                           | 1 Days |
| 2- Ripping                             | 1 Day  |
| 3- Spread Topsoil/Roughen              | 1 Days |
| 4- Re-establish Berms/Drainage Control | 1 Days |
| 5- Seed/Mulch                          | 1 Day  |

Estimated Total Time - 5 Days

\* After drilling and installation of all operational equipment.

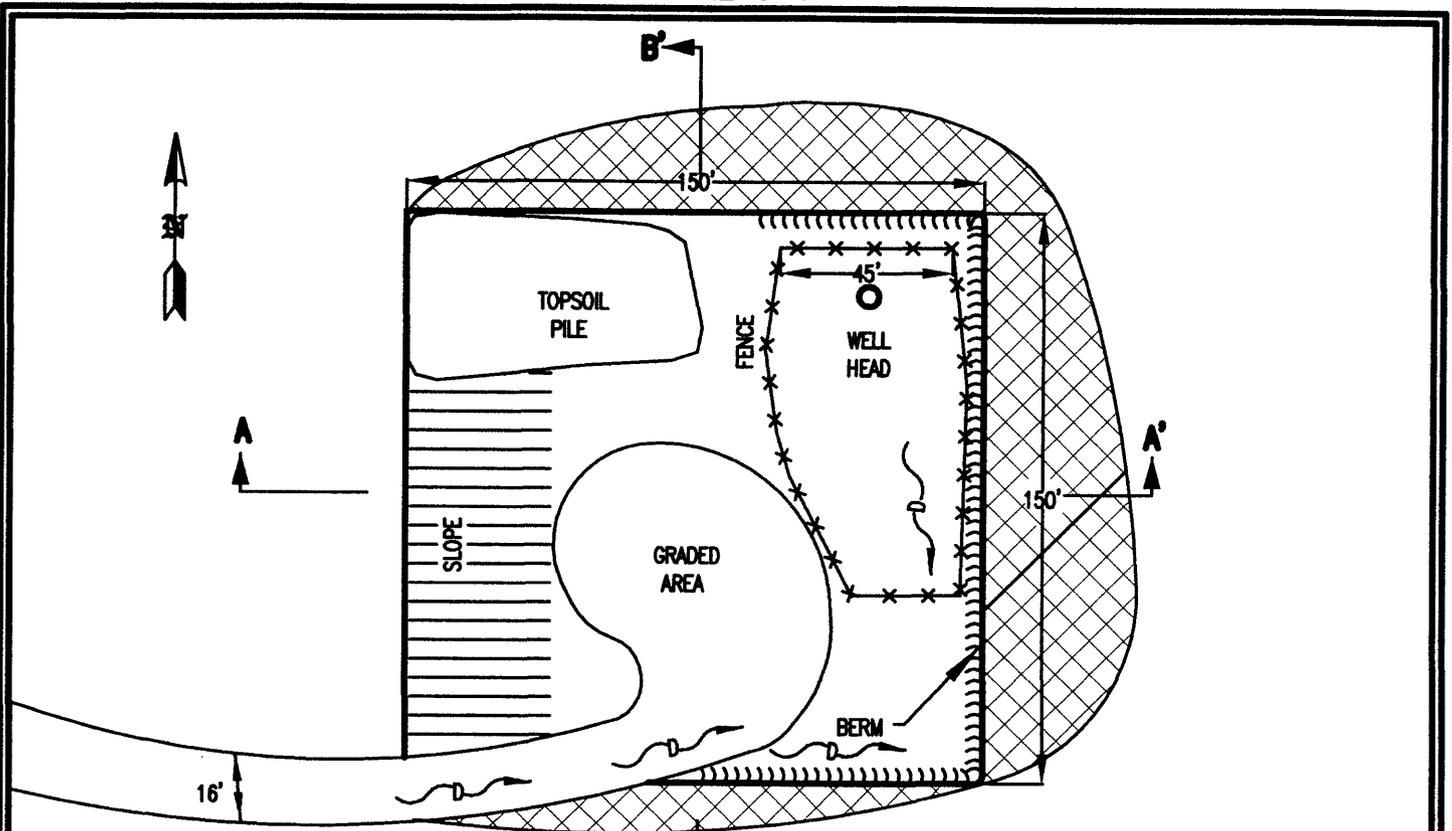
**FINAL RECLAMATION**

|                       |        |
|-----------------------|--------|
| 1- Structure Removal  | 1 Days |
| 2- Plug Well          | 1 Days |
| 3- Regrading          | 2 Days |
| 4- Ripping            | 1 Day  |
| 5- Topsoil/Roughening | 1 Days |
| 6- Seed/Mulch         | 1 Day  |

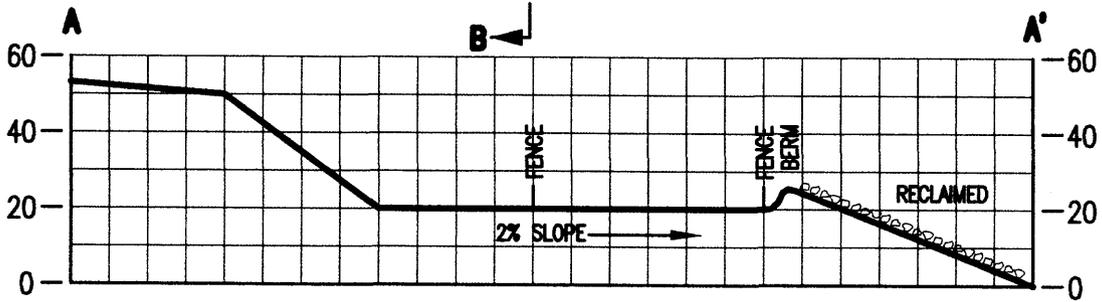
Estimated Total Time - 7 Days

**FIGURE 5-6**

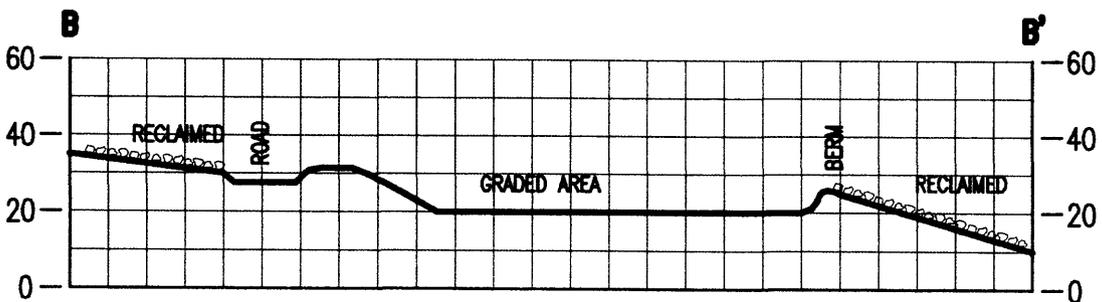
FIGURE 5-7



PLAN VIEW



SECTION A-A'



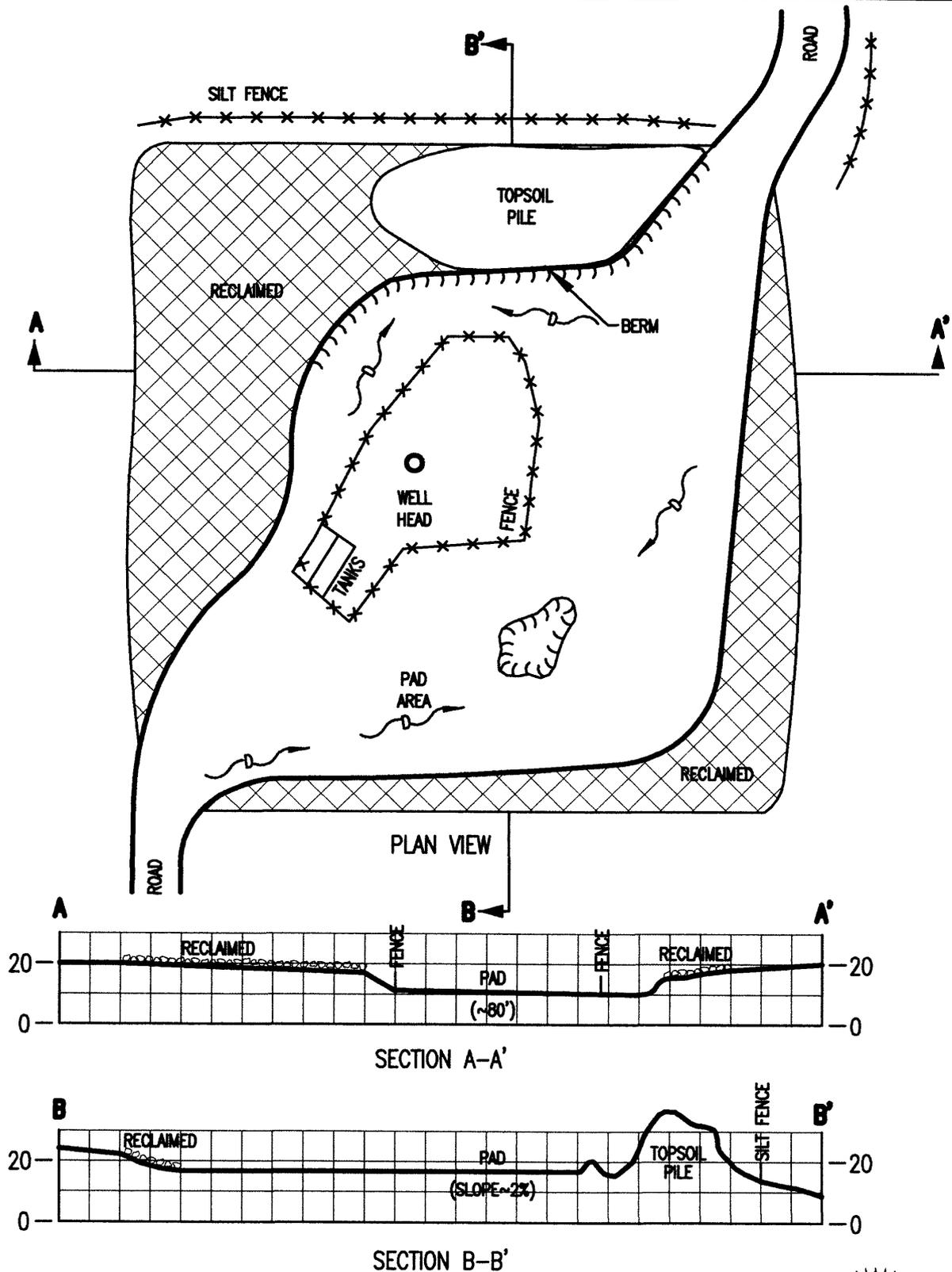
SECTION B-B'

Note: Runoff contained by berm.

GVH #1  
As-Constructed  
1" = 50'



FIGURE 5-8

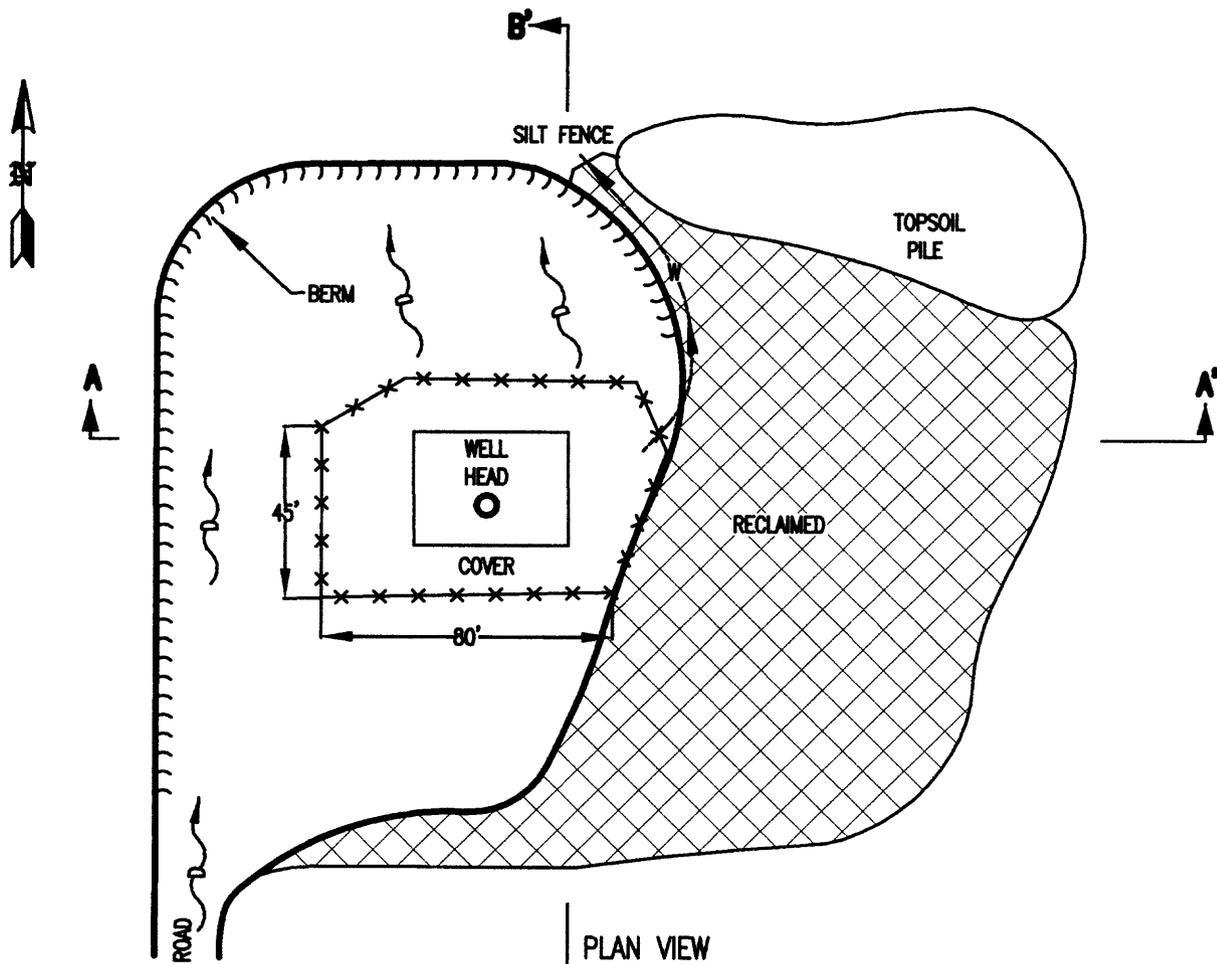


Note: Runoff contained by berm.

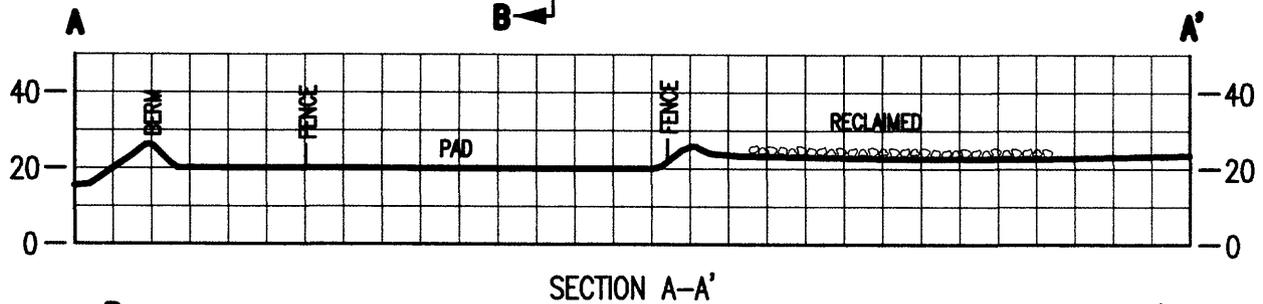
GVH #3  
As-Constructed  
1" = 50'



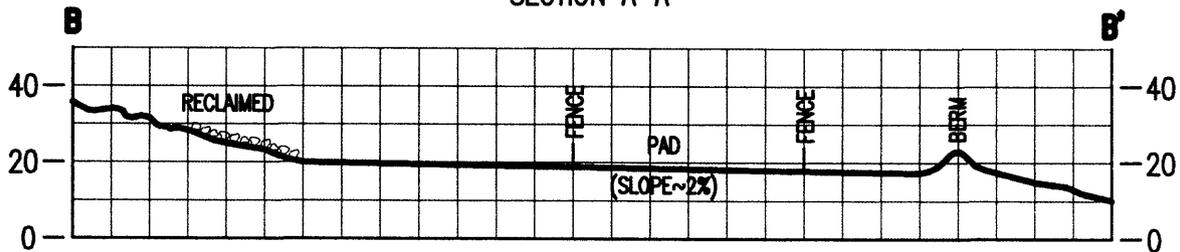
FIGURE 5-9



PLAN VIEW



SECTION A-A'



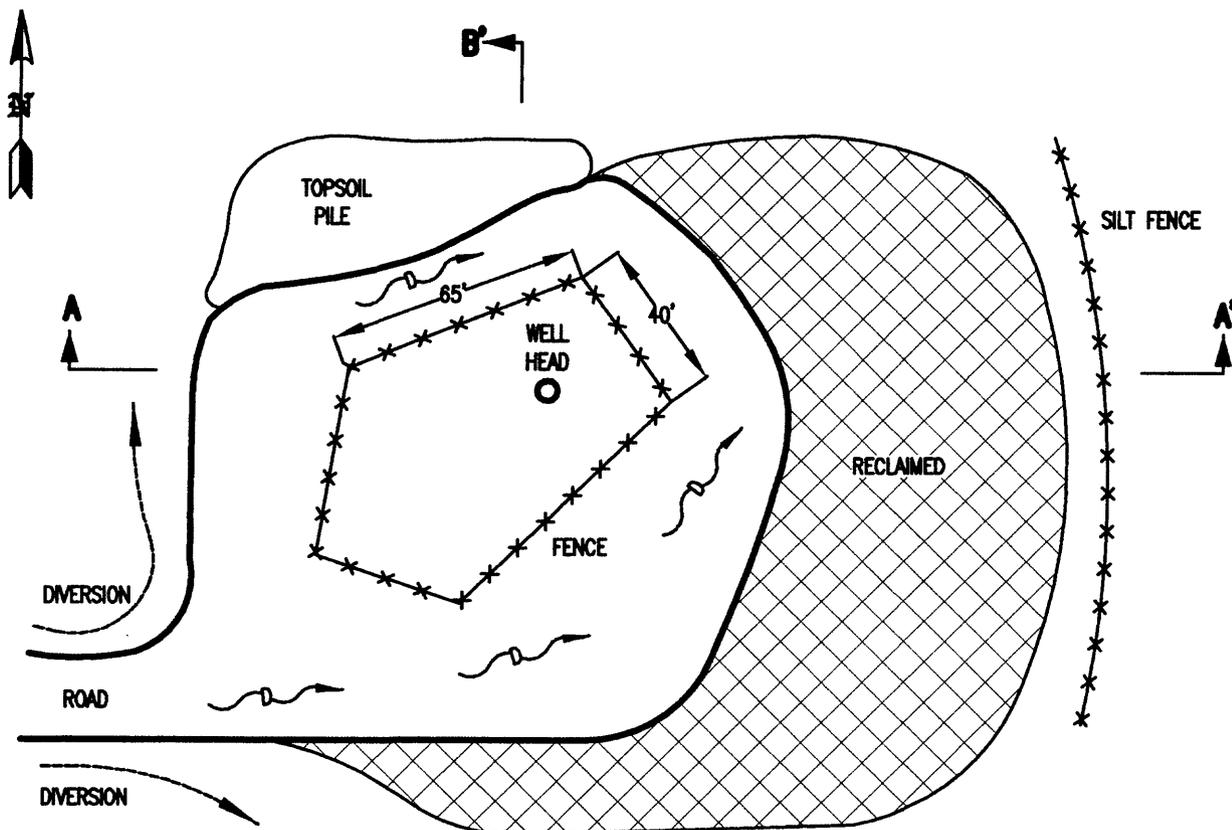
SECTION B-B'

Note: Runoff contained by berm. Water from hole treated by silt fence.

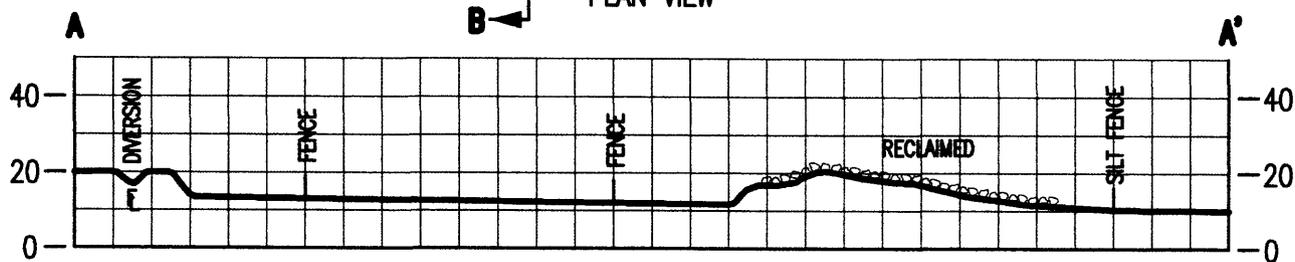
GVH #4  
As-Constructed  
1" = 50'



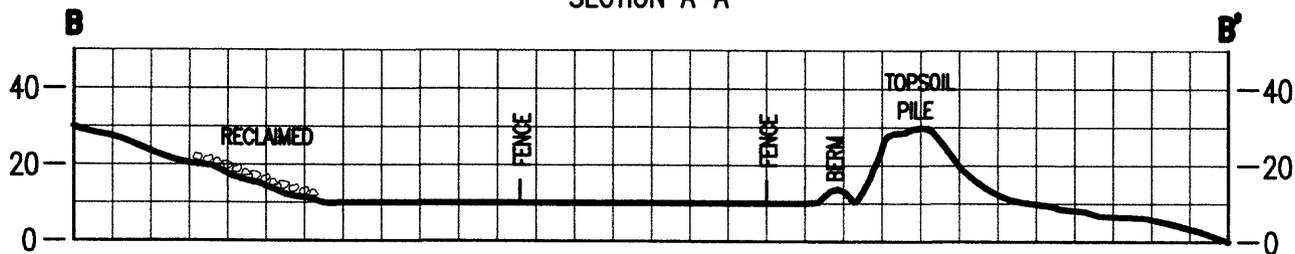
FIGURE 5-10



PLAN VIEW



SECTION A-A'



SECTION B-B'

Note: Water from road diverted. Runoff from pad contained by berms.

GVH #5  
As-Constructed  
1" = 50'



FIGURE 5-11

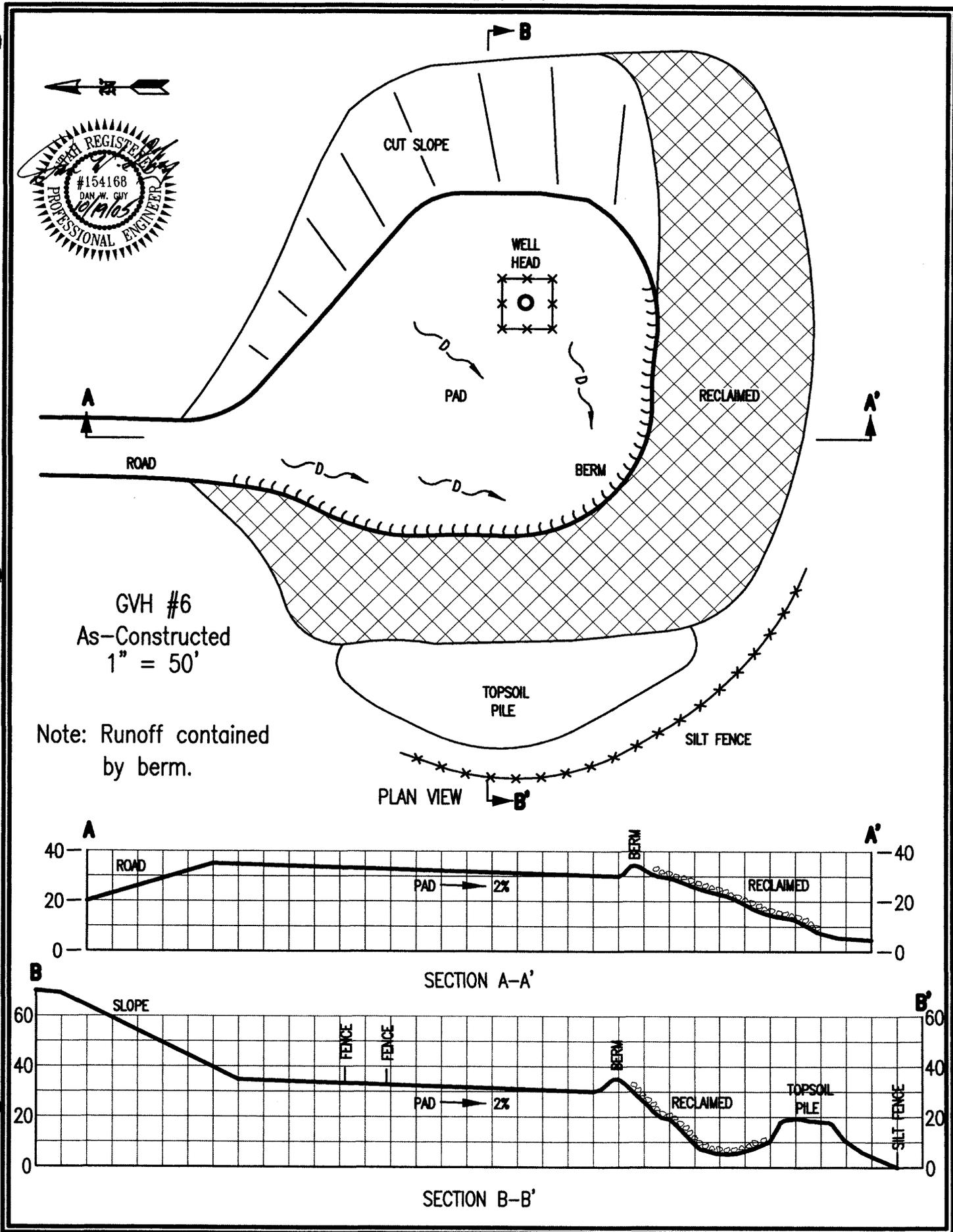
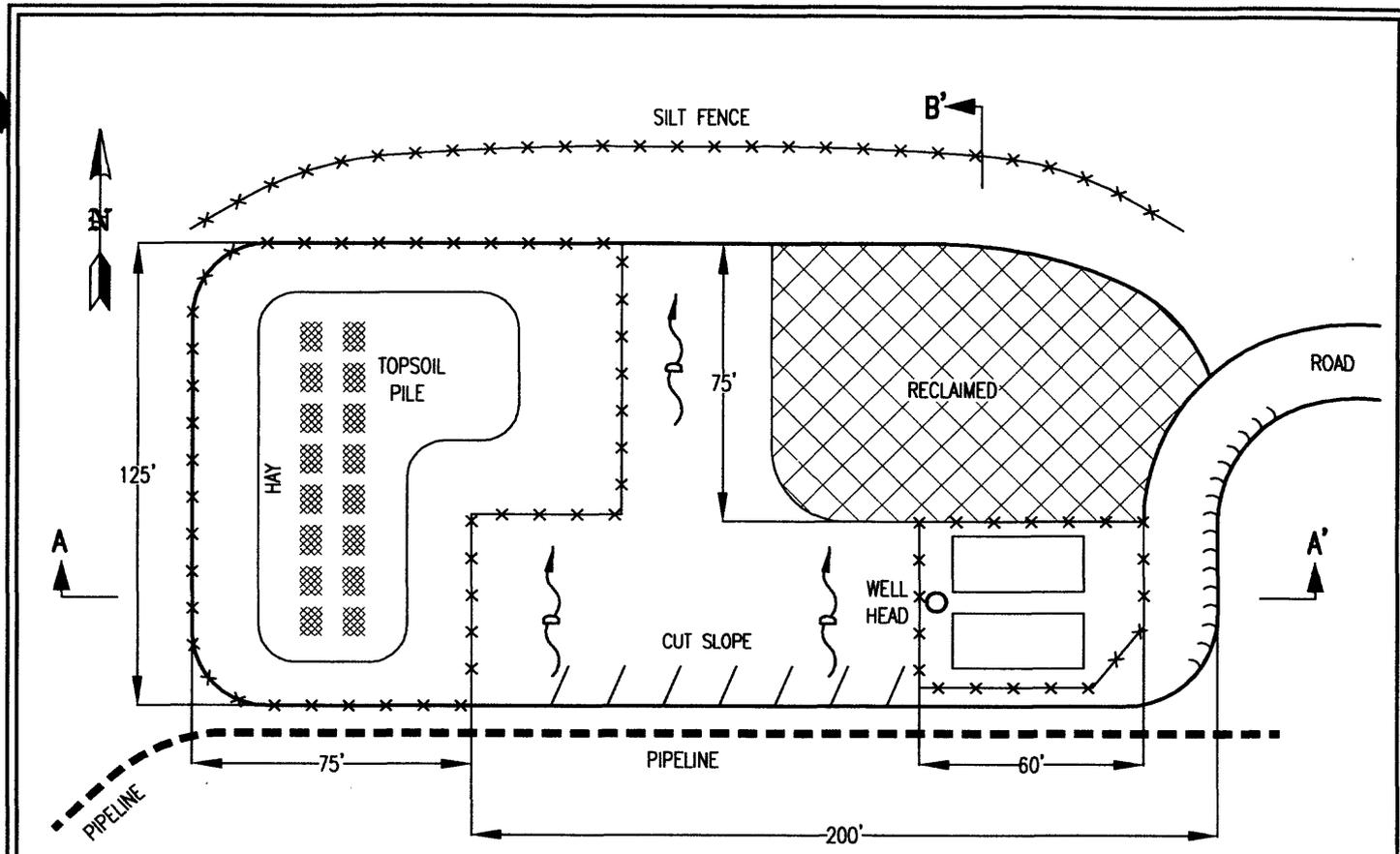
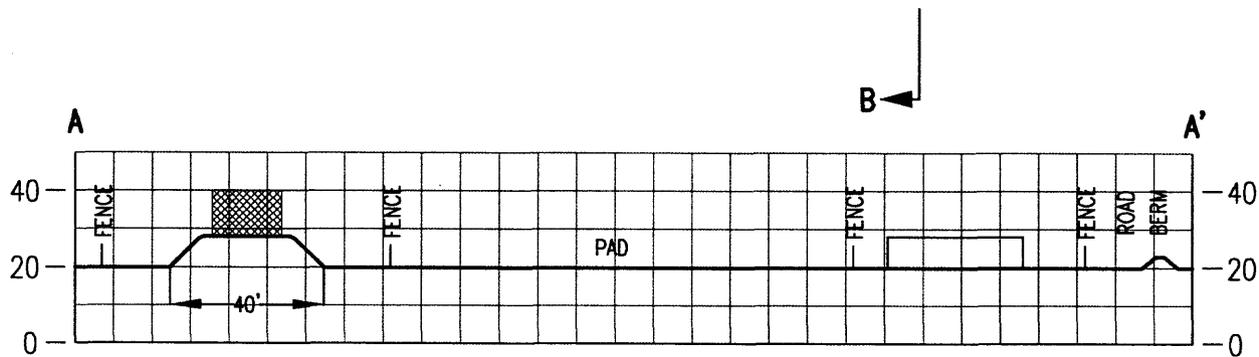


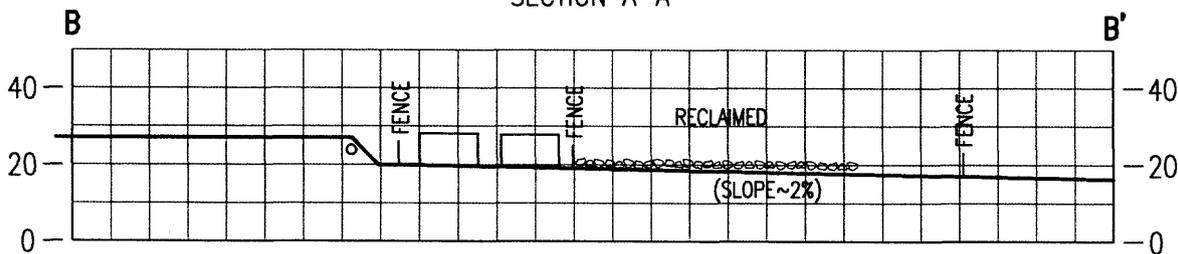
FIGURE 5-12



PLAN VIEW



SECTION A-A'



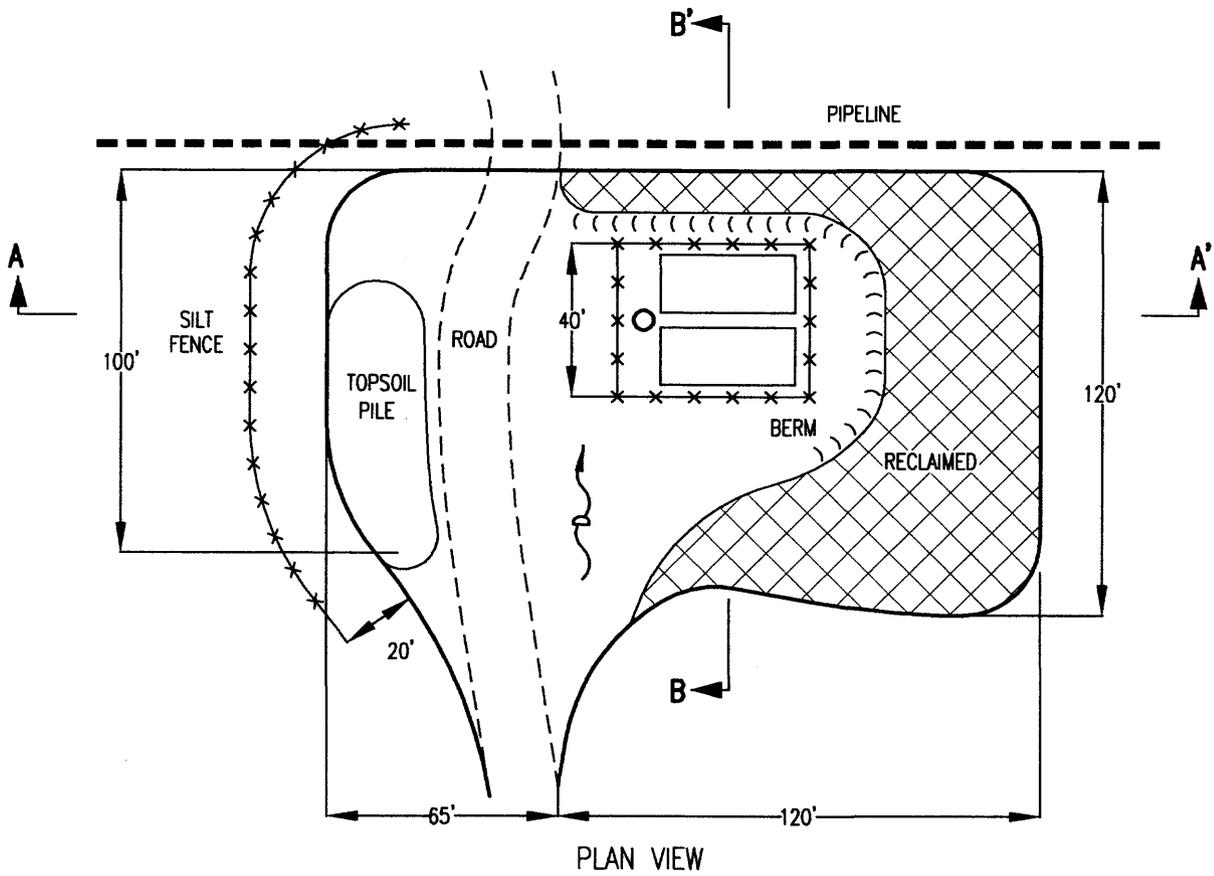
SECTION B-B'

Note: Runoff from pad treated by silt fence.

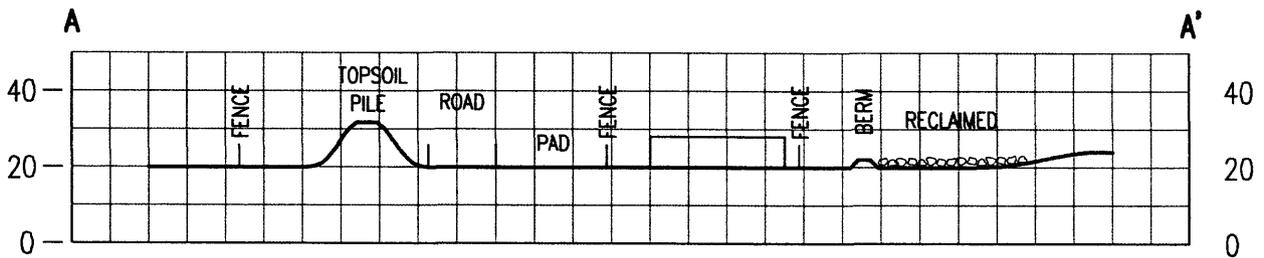
GVH #5A  
As-Constructed  
1" = 50'



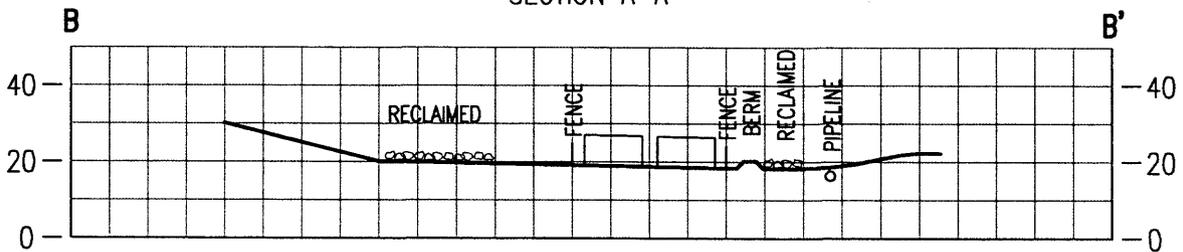
FIGURE 5-13



PLAN VIEW



SECTION A-A'



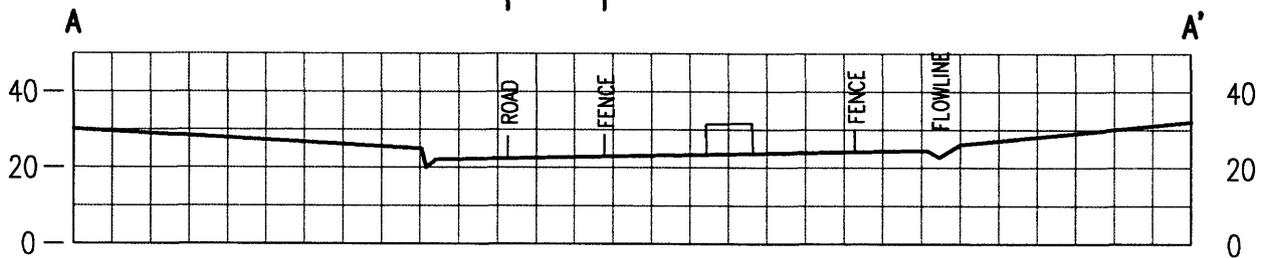
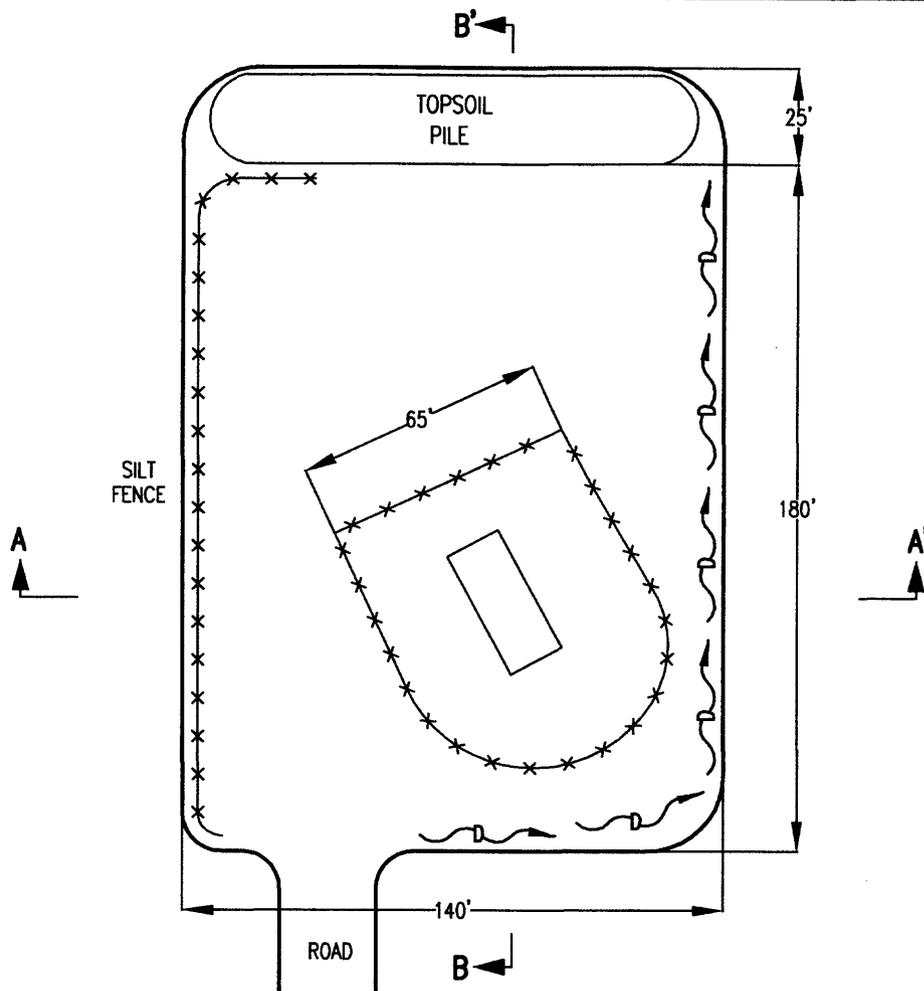
SECTION B-B'

Note: Runoff from pad treated by silt fence.

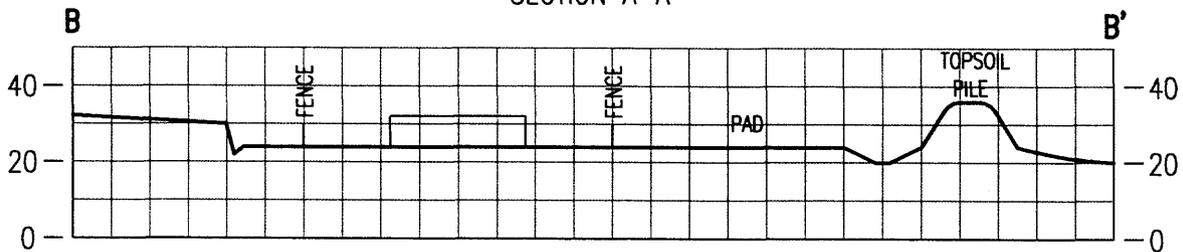
GVH #7/7A  
As-Constructed  
1" = 50'



FIGURE 5-14



SECTION A-A'



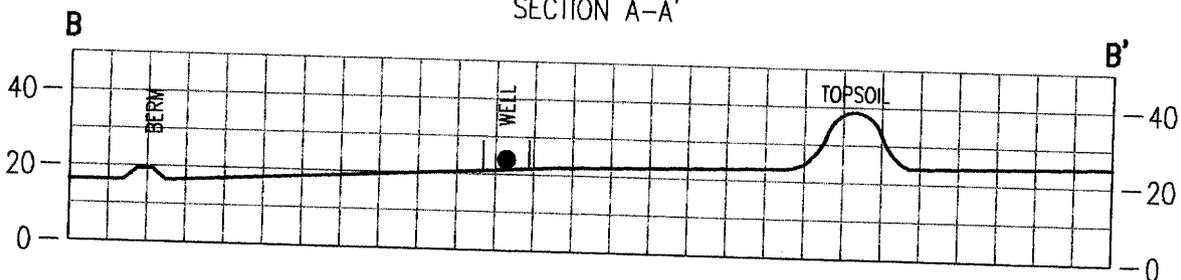
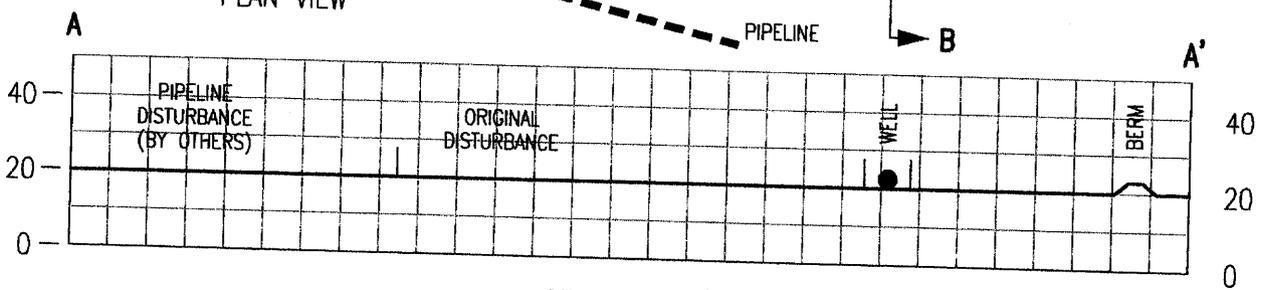
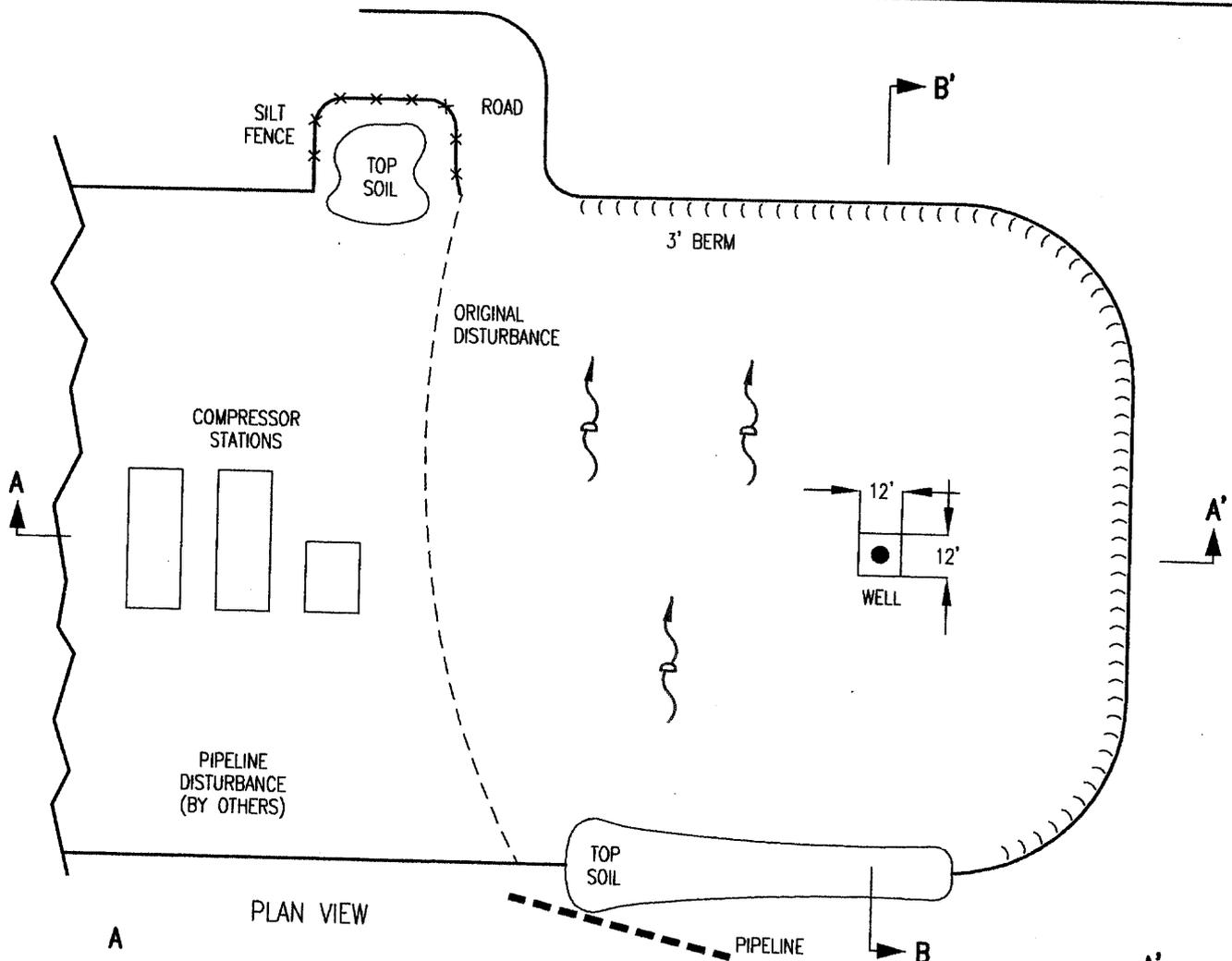
SECTION B-B'

Note: Runoff from pad treated by silt fence.

GVH #8  
As-Constructed  
1" = 50'



FIGURE 5-15



Note: Runoff contained by berm.

GVH #9  
As-Constructed  
1" = 50'



**(Revised)**  
**NOVEMBER 2006**

**CHAPTER 6**  
**GEOLOGY**

## TABLE OF CONTENTS

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| <b>610 INTRODUCTION</b> .....  | 6-1         |
| <b>611 General Requirements</b> .....  | 6-1         |
| <b>612 Certification</b> .....   | 6-1         |
| <b>620 ENVIRONMENTAL DESCRIPTION</b> .....                                     | 6-1         |
| <b>621 General Requirements</b> .....  | 6-1         |
| <b>622 Cross Sections, Maps and Plans</b> .....                                | 6-1         |
| <b>623 Geologic Determinations</b> .....                                       | 6-1         |
| <b>624 Geologic Information</b> .....  | 6-1         |
| 624.100 Regional Setting .....   | 6-1         |
| 624.200 Test Boring and Drill Hole Data (overburden removed) .....             | 6-1         |
| 624.300 Test Boring and Drill Hole Data (overburden not removed) ...           | 6-2         |
| <b>625 Additional Geologic Information</b> .....                               | 6-2         |
| <b>626 Sampling Waivers</b> .....  | 6-2         |
| <b>627 Description of the Overburden Thickness and Lithology</b> .....         | 6-2         |
| <b>630 OPERATION PLAN</b> .....  |             |
| <b>631 Casing and Sealing of Exploration Holes</b> .....                       | 6-2         |
| <b>632 Subsidence Monitoring</b> .....   | 6-2         |
| <b>640 PERFORMANCE STANDARDS</b> .....   | 6-2         |
| <b>641 Exploration and Drill Holes</b> .....                                   | 6-2         |
| <b>642 Monuments and Surface Markers of Subsidence Monitoring Points</b> ..... | 6-2         |

## **610 INTRODUCTION**

This chapter presents a description of the geologic resources in the area of the Centennial Project. Most of this chapter has been compiled from the approved Geology section of the Centennial Project, Mining and Reclamation Plan.

### **611 General Requirements**

The geologic resources in the Centennial Project area are discussed in Sections 621 through 627 of the M&RP. Information pertaining to the well sites is discussed below.

### **612 Certification**

All maps, plans, and cross-sections presented in this chapter, required by the regulations, have or will have been certified by a professional engineer.

## **620 ENVIRONMENTAL DESCRIPTION**

This section presents a description of the geologic resources in the Centennial Project well site areas.

### **621 General Requirements**

This section presents the regional and site-specific geologic information for the Centennial Project wells sites.

### **622 Cross Sections, Maps and Plans**

Refer to Plate 21 of the approved M&RP for geology associated with the entire permit area, including proposed well site locations.

### **623 Geologic Determinations**

No acid or toxic forming materials will originate at the well sites.

### **624 Geologic Information**

#### **624.100 Regional Setting**

Refer to Section 624 of the approved M&RP.

#### **624.200 Test Boring and Drill Hole Data (overburden removed)**

No test boring or drill cores are planned at the well sites.

**624.300 Test Boring and Drill Hole Data (overburden not removed)**

No test boring or drill cores are planned at the well sites.

**625 Additional Geologic Information**

It is not anticipated that any additional geologic data will need to be collected at the well sites.

**625 Sampling Waivers**

A sampling waiver is not requested at this time for the well sites.

**627 Description of the Overburden Thickness and Lithology**

Not applicable to this amendment.

**630 OPERATIONAL PLAN**

**631 Casing and Sealing of Exploration Holes**

Not applicable to this amendment.

**632 Subsidence Monitoring**

See Section 525 for additional information

**640 PERFORMANCE STANDARDS**

**641 Exploration and Drill Holes**

The performance standards used in the casing and sealing of all exploration holes and drill holes are outlined in the approved M&RP, Section 542.700.

**642 Monuments and Surface Markers of Subsidence Monitoring Points**

The performance standards used in the reclamation of all monuments and surface markers used in subsidence monitoring points are outlined in the approved M&RP, Section 525.

**(Revised)**  
**NOVEMBER 2006**

**CHAPTER 7**  
**HYDROLOGY**

## TABLE OF CONTENTS

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| <b>710 INTRODUCTION</b> .....                                | 7-1         |
| <b>711 General Requirements</b> .....                        | 7-1         |
| <b>712 Certification</b> .....                               | 7-1         |
| <b>713 Inspection</b> .....                                  | 7-1         |
| <b>720 ENVIRONMENTAL DESCRIPTION</b> .....                   | 7-1         |
| <b>721 General Requirements</b> .....                        | 7-1         |
| <b>722 Cross Sections and Maps</b> .....                     | 7-1         |
| 722.100 Location and Extent of Subsurface Water .....        | 7-1         |
| 722.200 Location of Surface Water Bodies .....               | 7-1         |
| 722.300 Locations of Monitoring Stations .....               | 7-2         |
| 722.400 Locations and Depth of Water Wells .....             | 7-2         |
| 722.500 Surface Topography .....                             | 7-2         |
| <b>723 Sampling and Analysis</b> .....                       | 7-2         |
| <b>724 Baseline Information</b> .....                        | 7-2         |
| 724.100 Groundwater Information .....                        | 7-2         |
| 724.200 Surface Water Information .....                      | 7-2         |
| 724.300 Geologic Information .....                           | 7-2         |
| 724.400 Climatological Information .....                     | 7-2         |
| 724.500 Supplemental Information .....                       | 7-2         |
| 724.600 Survey of Renewable Resource Lands .....             | 7-3         |
| 724.700 Alluvial Valley Floor Requirements .....             | 7-3         |
| <b>725 Baseline Cumulative Impact Area Information</b> ..... | 7-3         |
| <b>726 Modeling</b> .....                                    | 7-3         |
| <b>727 Alternate Water Source Information</b> .....          | 7-3         |

## TABLE OF CONTENTS (Continued)

| <u>Section</u>  | <u>Page</u> |
|---|-------------|
| <b>728 Probable Hydrologic Consequences</b> .....               | <b>7-3</b>  |
| 728.100 Potential Impacts of Surface and Groundwater .....      | 7-3         |
| 728.200 Baseline Hydrologic and Geologic Information .....      | 7-3         |
| 728.300 PHC Determination .....                                 | 7-3         |
| <b>729 Cumulative Hydrologic Impact Assessment (CHIA)</b> ..... | <b>7-4</b>  |
| <b>730 OPERATION PLAN</b> .....                                 | <b>7-4</b>  |
| <b>731 General Requirements</b> .....                           | <b>7-4</b>  |
| 731.100 Hydrologic - Balance Protection .....                   | 7-5         |
| 731.200 Water Monitoring .....                                  | 7-5         |
| 731.300 Acid or Toxic Forming Materials .....                   | 7-5         |
| 731.400 Transfer of Wells .....                                 | 7-5         |
| 731.500 Discharge .....   | 7-5         |
| 731.600 Stream Buffer Zone .....                                | 7-5         |
| 731.700 Cross Section and Maps .....                            | 7-5         |
| 731.800 Water Rights and Replacement .....                      | 7-5         |
| <b>732 Sediment Control Measures</b> .....                      | <b>7-6</b>  |
| 732.100 Siltation Structures .....                              | 7-6         |
| 732.200 Sedimentation Pond .....                                | 7-6         |
| 732.300 Diversions .....  | 7-6         |
| 732.400 Road Drainage .....                                     | 7-6         |
| <b>733 Impoundments</b> .....                                   | <b>7-6</b>  |
| 733.100 General Plans .....                                     | 7-6         |
| 733.200 Permanent and Temporary Impoundments .....              | 7-6         |
| <b>734 Discharge Structures</b> .....                           | <b>7-7</b>  |
| <b>735 Disposal of Excess Spoil</b> .....                       | <b>7-7</b>  |
| <b>736 Coal Mine Waste</b> .....                                | <b>7-7</b>  |
| <b>737 Non-Coal Mine Waste</b> .....                            | <b>7-7</b>  |

## TABLE OF CONTENTS (Continued)

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| 738 Temporary Casing and Sealing of Wells .....                                    | 7-7         |
| 740 DESIGN CRITERIA AND PLANS .....  | 7-7         |
| 741 General Requirements .....   | 7-7         |
| 742 Sediment Control Measures .....  | 7-7         |
| 742.100 General Requirements .....   | 7-7         |
| 742.200 Siltation Structures .....   | 7-8         |
| 742.300 Diversions .....   | 7-8         |
| 742.400 Road Drainage .....  | 7-8         |
| 743 Impoundments .....   | 7-8         |
| 744 Discharge Structures .....   | 7-8         |
| 745 Disposal of Excess Spoil .....   | 7-8         |
| 746 Coal Mine Waste .....  | 7-8         |
| 746.100 General Requirements .....   | 7-8         |
| 746.200 Refuse Piles .....   | 7-8         |
| 746.300 Impounding Structures .....  | 7-8         |
| 746.400 Return of Coal Processing Waste to Abandoned Underground<br>Workings ..... | 7-9         |
| 747 Disposal of Non-Coal Waste .....   | 7-9         |
| 748 Casing and Sealing Wells .....   | 7-9         |
| 750 PERFORMANCE STANDARDS .....  | 7-9         |
| 751 Water Quality Standards and Effluent Limitations .....                         | 7-9         |
| 752 Sediment Control Measures .....  | 7-9         |
| 752.100 Siltation Structures and Diversions .....                                  | 7-9         |
| 752.200 Road Drainage .....  | 7-9         |

## TABLE OF CONTENTS (Continued)

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| 753 Impoundments and Discharge Structures .....                                | 7-9         |
| 754 Disposal of Excess Spoil, Coal Mine Waste and Non-Coal Mine<br>Waste ..... | 7-9         |
| 755 Casing and Sealing .....   | 7-10        |
| 760 RECLAMATION .....  | 7-10        |
| 761 General Requirements .....   | 7-10        |
| 762 Roads .....  | 7-10        |
| 762.100 Restoring the Natural Drainage Patterns .....                          | 7-10        |
| 762.200 Reshaping Cut and Fill Slopes .....                                    | 7-10        |
| 763 Siltation Structures .....   | 7-10        |
| 763.100 Maintenance of Siltation Structures .....                              | 7-10        |
| 763.200 Removal of Siltation Structures .....                                  | 7-10        |
| 764 Structure Removal .....  | 7-10        |
| 765 Permanent Casing and Sealing of Wells .....                                | 7-10        |

### List of Attachments

Attachment 7-1 Hydrology Calculations

## **710 INTRODUCTION**

### **711 General Requirements**

This chapter presents a description of the following:

- Proposed operations and the potential impacts to the hydrologic balance;
- Methods of compliance with design criteria and the calculations utilized to show compliance; and
- Applicable hydrologic performance standards.

As-constructed drawings are provided for completed sites in Figures 5-7 through 5-15. Hydrology calculations are provided in Attachment 7-1.

### **712 Certification**

All required maps, plans, and cross sections presented in this chapter have been or will be certified by a qualified, registered professional engineer.

### **713 Inspection**

Inspections are not required since no permanent impoundments will exist at the well sites.

## **720 ENVIRONMENTAL DESCRIPTION**

### **721 General Requirements**

This section presents a description of the pre-mining hydrologic resources within the well pad and their adjacent areas that may be affected or impacted by the proposed coal mining and reclamation operations.

### **722 Cross Sections and Maps**

#### **722.100 Location and Extent of Subsurface Water**

Section 724 of the approved M&RP provides baseline information. Appendix L of the M&RP includes Surface and Ground Water Inventories.

#### **722.200 Location of Surface Water Bodies**

Figures 4 & 5 in the approved M&RP (Appendix L: Surface and Groundwater Hydrologic Inventory) show the locations of the surface-water bodies and existing or pending water rights. Section 724.200 of the approved M&RP provides baseline surface water conditions.

### **722.300 Locations of Monitoring Stations**

Figure 6 and IV-II in the approved M&RP (Appendix L: Surface and Groundwater Hydrologic Inventory) shows the location of surface water and groundwater monitoring stations.

### **722.400 Locations and Depth of Water Wells**

Refer to Section 722.400 of the approved M&RP for information pertaining to the groundwater monitoring wells.

### **722.500 Surface Topography**

Surface topography features at the well sites and adjacent areas are shown on Figure 1-1.

### **723 Sampling and Analysis**

Refer to Section 723 of the approved M&RP.

### **724 Baseline Information**

Refer to Section 724 of the approved M&RP.

### **724.100 Groundwater Information**

Refer to Section 724.100 of the approved M&RP.

### **724.200 Surface Water Information**

Refer to Section 724.200 of the approved M&RP.

### **724.300 Geologic Information**

Geologic information related to the well sites and adjacent areas is presented in Chapter 6 of this submittal and in the approved M&RP.

### **724.400 Climatological Information**

Climatological information is provided in Section 724.400 of the approved M&RP.

### **724.500 Supplemental Information**

Refer to Section 724.500 of the approved M&RP.

## **724.600 Survey of Renewable Resource Lands**

Refer to Section 724.600 of the approved M&RP.

## **724.700 Alluvial Valley Floor Requirements**

Information provided in Appendix L of the M&RP shows this area does not meet requirements for Alluvial Valley Floors.

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

The CHIA currently in place for the Centennial Project covers the well sites. The hydrologic and geologic information required for the Division to develop a Cumulative Hydrologic Impact Assessment (CHIA) is presented in the approved M&RP.

## **726 Modeling**

No groundwater or surface water modeling was conducted in support of this submittal

## **727 Alternative Water Source Information**

Not applicable.

## **728 Probable Hydrologic Consequences**

This section addresses the probable hydrologic consequences of construction and reclamation operations at the well sites. Mitigation measures are discussed generally in this section and in detail in Section 730 of the approved M&RP.

### **728.100 Potential Impacts of Surface and Groundwater**

Potential impacts of the well sites in this area on the quality and quantity of surface and groundwater flow may include contamination from materials associated with the drilling of the wells. The potential impact is addressed in Section 728.300 of this submittal.

### **728.200 Baseline Hydrologic and Geologic Information**

Baseline geologic information is presented in Chapter 6 of the approved M&RP. Baseline hydrologic information is presented in Section 724.100 and 724.200 of the approved M&RP.

### **728.300 PHC Determination**

**Potential Impacts to the Hydrologic Balance** - Potential impacts of the Centennial Project on the hydrologic balance of the well sites and adjacent areas are addressed in the

subsections of this submittal and the approved M&RP.

**Acid and Toxic Forming Materials** - No acid or toxic forming materials have been identified in the soils or strata of the Centennial Project (Chapter 6, Section 623 of this submittal). Additional information is located in Appendix E of the approved M&RP.

**Groundwater** - During drilling of the wells, the groundwater encountered will be affected. Drilling mud will be used to seal the groundwater aquifers. Once drilling is completed, the casing will be grouted in the well hole. This will seal the aquifers to prevent any groundwater from migrating down the outside of the casing into the mine.

**Potential Hydrocarbon Contamination** - Hydrocarbon products will not be stored at the well sites, however fuels, greases, and other oils may leak from equipment during drilling operations. Absorbent materials will be used for the collection of leaked fuels, greases, and other oils. The saturated absorbent materials will be disposed of at an appropriate landfill facility.

## **729 Cumulative Hydrologic Impact Assessment (CHIA)**

The Cumulative Hydrologic Impact Assessment currently in place for the Centennial Project includes the well sites and adjacent areas.

## **730 OPERATION PLAN**

### **731 General Requirements**

#### **731.100 Hydrologic - Balance Protection**

**Groundwater Protection** - The effect on groundwater at the well sites is expected to be minimal. Groundwater encountered during drilling will be sealed off, refer to Section 728.300.

**Surface Water Protection** - To protect the hydrologic balance, construction, maintenance, and reclamation operations will be conducted to handle earth materials and runoff in a manner that prevents, to the extent possible, additional contributions of suspended solids to stream flow outside the permit are, and otherwise prevent water pollution.

During initial drilling, the sites will be graded to ensure that storm runoff will flow towards the berms surrounding the entire drilling pad area. The berms will direct the runoff to the lowest point(s) within the pad area where a silt fence and/or straw bale dike(s) will treat the runoff. The berm placed at the top of the drilling pad cut slopes will divert runoff around the drilling pad. Thus reducing the runoff affected by the drilling pad.

After drilling, the pad size will be reduced for exhausting operations. The pad will be re-

graded to cause the storm runoff to sheet flow towards a silt fence and/or straw bale dike. A berm will be placed at the top of the fill slope to direct any runoff from the operational pad to the silt fence and/or straw bale dike. The silt fences and/or straw bale dikes will be periodically inspected, and accumulated sediment will be removed as needed to maintain functionality. The sediment from the silt fence and/or straw bale dikes will be piled on the pad and will be used for fill during final reclamation of the well site. During the drilling phase a berm and silt fence will be installed at the toe of the fill slope to treat any runoff from the drilling pad. During the operational phase there will still be sediment control (silt fence) at the toe of the slope

#### **731.200 Water Monitoring**

No water monitoring will be conducted at the degas well sites. Refer to approved M&RP for a description of water monitoring.

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

No acid or toxic forming materials are anticipated at the well sites. (see Section 728.300).

#### **731.400 Transfer of Wells**

Refer to Section 731.400 of the approved M&RP.

#### **731.500 Discharge**

No discharge to underground workings.

#### **731.600 Stream Buffer Zones**

**Stream Channel Diversions** - No stream channel diversions are planned at the well sites.

**Buffer Zone Designation** - None of the drilling sites are adjacent to a stream, therefore the establishment of a stream buffer zone is not necessary.

#### **731.700 Cross Section and Maps**

Not applicable.

#### **731.800 Water Rights and Replacement**

Refer to Sections 728.300 and 731.800 of the approved M&RP.

## **732 Sediment Control Measures**

The sediment control measures within the well sites have been designed to prevent additional contributions of sediment to stream flow or to runoff outside the well sites. In addition, the well sites have been designed to minimize erosion to the extent possible.

The structures to be used for runoff control at the well sites are berms, silt fences and/or straw bale dikes. Please refer to the drawings previously provided with this Appendix (5-1, 5-2, 5-3, 5-4 and 5-5), and new As-Constructed drawings 5-7 through 5-15, found at the end of Chapter 5. These drawings show slope and location of sedimentation structures (silt fences, berms).

### **732.100 Siltation Structures**

Berms, silt fences and straw bales dikes will be used to treat runoff.

### **732.200 Sedimentation Pond**

The drilling sites will not have sedimentation ponds.

### **732.300 Diversions**

Refer to Section 731.100 of this submittal.

### **732.400 Road Drainage**

No diversion ditches will be constructed along the roads leading to the well sites. See Figure 5-5 for typical road cross section. Where needed roads accessing the drill sites will have a water bar constructed at the base of the road to divert water off the road prior to the runoff reaching the drill pad. The existing access road up Deadman Canyon to the locations will be equipped with silt fences in the Spring/Summer of 2005 to help control sediment. In addition to the water bars mentioned, 18-24 inch culverts will be installed on this private road and left in place at the owner's request.

## **733 Impoundments**

### **733.100 General Plans**

Not applicable.

### **733.200 Permanent and Temporary Impoundments**

No permanent impoundments will exist at the well sites.

### **734 Discharge Structures**

A berm will surround the entire drill pad at each well site during the drilling phase. The berm will divert undisturbed runoff around the drilling pad and direct runoff from the pad to a silt fence/straw bale dike at the lowest point within the well pad disturbed area. A silt fence and/or straw bale dike will be the discharge structure for each of the well sites during the operational phase.

### **735 Disposal of Excess Spoil**

There will be no excess spoil generated at the well sites.

### **736 Coal Mine Waste**

There will be no coal mine waste generated or stored at the well sites.

### **737 Non-Coal Mine Waste**

There will be no non-coal mine waste disposal at the well site.

### **738 Temporary Casing and Sealing of Wells**

Refer to Section 542.700 of this submittal.

## **740 DESIGN CRITERIA AND PLANS**

### **741 General Requirements**

This submittal includes general well site plans that incorporate design criteria for the control of drainage.

### **742 Sediment Control Measures**

#### **742.100 General Requirements**

**Design** - Sediment control measures have been formulated to prevent additional contributions of sediment to stream flow or to runoff outside the well site area; and minimize erosion to the extent possible.

**Measures and Methods** - Sediment control methods will include silt fence, berms, and straw bales to reduce runoff and trap sediment.

## **742.200 Siltation Structures**

**General Requirements** - Additional contributions of suspended solids and sediment or runoff outside the well site area will be prevented to the extent possible using silt fence, berms, and straw bale dikes. Siltation structures (berms, silt fences and/or straw bale dikes) will be installed before the topsoil is removed from the well site. Construction activities will not occur during major precipitation events.

**Design** - All hydrology calculations will be made using the 10-year, 24-hour precipitation event. Hydrology calculations are included in Attachment 7-1.

## **742.300 Diversions**

No diversion ditches will be constructed as part of the drilling or operational phases.

## **742.400 Road Drainage**

Refer to Section 732.400 of this submittal.

## **743 Impoundments**

No impoundments will exist at the wells sites.

## **744 Discharge Structures**

No discharge structures have been planned or designed.

## **745 Disposal of Excess Spoil**

There will be no excess spoil generated at the well sites.

## **746 Coal Mine Waste**

### **746.100 General Requirements**

There will be no coal mine waste used at the well sites.

### **746.200 Refuse Piles**

There will be no refuse piles at the well sites.

### **746.300 Impounding Structures**

Refer to Section 733.200 of this submittal.

## **746.400 Return of Coal Processing Waste to Abandoned Underground Workings**

No coal processing waste will be generated at the well sites.

### **747 Disposal of Non-Coal Mine Waste**

All non-coal mine waste will be disposed of at an approved landfill.

### **748 Casing and Sealing Wells**

Refer to Section 542.700 of this submittal.

## **750 PERFORMANCE STANDARDS**

### **751 Water Quality Standards and Effluent Limitations**

Water encountered during drilling and runoff water will be treated using silt fence and/or straw bale dikes prior to leaving the site. Should it become necessary the water encountered during drilling will be pumped into a tank and hauled from the site for disposal at a licensed facility.

### **752 Sediment Control Measures**

All sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs presented in Section 732, 742, and 760 of this submittal.

#### **752.100 Siltation Structures and Diversions**

Siltation structures will be located, maintained, constructed and reclaimed according to plans and designs presented in Section 732, 742, and 763 of this submittal.

#### **752.200 Road Drainage**

Refer to Section 732.400 of this submittal.

### **753 Impoundments and Discharge Structures**

Refer to Section 733.200 of this submittal.

### **754 Disposal of Excess Spoil, Coal Mine Waste and Non-Coal Mine Waste**

There will be no excess spoil or coal mine waste generated at the well sites. Refer to Section 747 of this submittal regarding non-coal waste disposal.

## **755 Casing and Sealing**

Refer to Section 542.700 of this submittal.

## **760 RECLAMATION**

### **761 General Requirements**

A detailed reclamation plan for the well sites is presented in Section 540. No structures will exist at the well sites.

### **762 Roads**

Refer to Section 542.600.

#### **762.100 Restoring the Natural Drainage Patterns**

The natural drainage patterns will be restored after degassification is completed.

#### **762.200 Reshaping Cut and Fill Slopes**

Cut and fill slopes will be reshaped at the well sites.

### **763 Siltation Structures**

#### **763.100 Maintenance of Siltation Structures**

All siltation structures will be maintained until removed in accordance with the approved reclamation plan.

#### **763.200 Removal of Siltation Structures**

When a siltation structure is removed, the land on which the siltation structure was located will be regraded and revegetated in accordance with the reclamation plan presented in Section 540.

### **764 Structure Removal**

A general timetable for the reclamation of the sites is presented in Figure 5-6.

### **765 Permanent Casing and Sealing of Wells**

Refer to Section 542.700 of this submittal.

**ATTACHMENT 7-1  
HYDROLOGY CALCULATIONS**



## HYDROLOGY CALCULATIONS

General - The potential runoff for each of the Gob Gas Vent Hole sites is calculated using the 10 year - 24 hour precipitation event of 1.82" and other criteria as described in the approved M.R.P. Section R645-301-512.240.

Runoff and controls for completed sites are based on existing sizes and conditions. Contemporaneously reclaimed areas have been mulched and roughened, seeded, and protected by silt fences as needed, and are therefore considered adequate for runoff protection and control.

Proposed sites are based on the projected original disturbed area size of approximately 1.0 acre, with a length of 200' and a slope of 2%.

Runoff protection and control for all sites is primarily through total containment by berms; however, silt fences are used as needed to provide additional protection below slope areas.

The following is a summary of runoff calculations for the existing as well as the proposed gob gas vent holes, along with controls and treatment of runoff.

| GVH Runoff Summary |                |                      |                 |                         |                              |
|--------------------|----------------|----------------------|-----------------|-------------------------|------------------------------|
| Hole               | Status         | Disturbed Area (ac.) | Peak Flow (cfs) | Runoff Volume (ac. ft.) | Control/Treatment            |
| GVH#1              | Hole Completed | 0.52                 | 0.44            | 0.04                    | Berm/Containment             |
| GVH#3              | Hole Completed | 0.55                 | 0.47            | 0.04                    | Berm/Containment             |
| GVH#4              | Hole Completed | 0.45                 | 0.38            | 0.04                    | Berm/Containment /Silt Fence |
| GVH#5              | Hole Completed | 0.51                 | 0.44            | 0.04                    | Berm/Containment             |
| GVH#6              | Hole Completed | 0.46                 | 0.39            | 0.04                    | Berm/Containment             |
| GVH#5A             | Hole Completed | 0.59                 | 0.50            | 0.05                    | Berm/Silt Fence              |
| GVH#7, 7A*         | Hole Completed | 0.33                 | 0.28            | 0.03                    | Berm/Silt Fence              |
| GVH#8              | Hole Completed | 0.65                 | 0.55            | 0.05                    | Silt Fence                   |
| GVH#9              | Hole Completed | 0.81                 | 0.68            | 0.06                    | Berm/Containment             |
| GVH#5B             | Proposed       | 1.0                  | 0.86            | 0.08                    | Berm/Containment             |
| GVH#8A             | Proposed       | 1.0                  | 0.86            | 0.08                    | Berm/Containment             |

\* GVH #7A (re-drill) proposed on existing pad area GVH #7.

**Conclusion** - Based on an average berm height of 30", the runoff from a 10 year - 24 hour precipitation event can be totally contained on the existing drill pads in an area of approximately 26' x 26', and the runoff from the proposed sites (prior to contemporaneous reclamation) can be totally contained in an area of approximately 37' x 37'. All sites have at least this much area behind the berms for total containment.

(Revised)  
NOVEMBER 2006

**CHAPTER 8**  
**BONDING AND INSURANCE**

## TABLE OF CONTENTS

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| 810 BONDING DEFINITIONS AND DIVERSION RESPONSIBILITIES .....                             | 8-1         |
| 820 REQUIREMENTS TO FILE A BOND .....  | 8-1         |
| 830 DETERMINATION OF BOND AMOUNT .....   | 8-1         |
| 840 GENERAL TERMS AND CONDITIONS OF THE BOND .....                                       | 8-1         |
| 850 BONDING REQUIREMENTS FOR UNDERGROUND COAL MINING AND<br>RECLAMATION ACTIVITIES ..... | 8-1         |
| 860 FORMS OF BONDS .....   | 8-1         |
| 870 REPLACEMENT BONDS .....  | 8-1         |
| 880 REQUIREMENTS TO RELEASE PERFORMANCE BONDS .....                                      | 8-2         |
| 890 TERMS AND CONDITIONS FOR LIABILITY INSURANCE .....                                   | 8-2         |

## **810 BONDING DEFINITIONS AND DIVERSION RESPONSIBILITIES**

This chapter provides information regarding the bonding for reclamation of the completed and proposed gob gas vent hole sites at the Centennial Project. Andalex, Resources, Inc. has on file with the Division a bond payable to the Division for performance of all requirements of the State Program.

## **820 REQUIREMENTS TO FILE A BOND**

A description of the disturbed area location for each well site is found in Chapter 1, Table 1-1. Reclamation of the disturbed area are discussed in Section 340 of this submittal. The performance bond period is for the duration of coal mining and reclamation operations including the extended period designated by the Division. The bond is in the form of a surety bond and is described in Section 860 of the M&RP.

## **830 DETERMINATION OF BOND AMOUNT**

The existing reclamation bond of \$1,080,000, along with additional bonding to be provided under other pending amendments, is sufficient to assure the completion of the reclamation plan.

## **840 GENERAL TERMS AND CONDITIONS OF THE BOND**

Refer to Chapter 8 and Appendix B of the approved M&RP.

## **850 BONDING REQUIREMENTS FOR UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES**

Refer to Chapter 8 of the approved M&RP.

## **860 FORMS OF BONDS**

Refer to Chapter 8 of the approved M&RP.

## **870 REPLACEMENT BONDS**

Refer to Chapter 8 of the approved M&RP.

**880 REQUIREMENTS TO RELEASE PERFORMANCE BONDS**

The applicant will comply with the requirements described in Section R645-301-880 of the Division regulations when applying for the release of performance bonds.

**890 TERMS AND CONDITIONS FOR LIABILITY INSURANCE**

Certificates of insurance issued for the Centennial Project are included in Appendix B of the approved M&RP.