



State of Utah  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

1594 West North Temple, Suite 1210  
PO Box 145801  
Salt Lake City, Utah 84114-5801  
(801) 538-5340 telephone  
(801) 359-3940 fax  
(801) 538-7223 TTY  
www.nr.utah.gov

Michael O. Leavitt  
Governor  
Robert L. Morgan  
Executive Director  
Lowell P. Braxton  
Division Director

September 3, 2002

Dave Miller, P.E., Business Manager  
Lodestar Energy, Inc. / Mountain Operations  
HC 35, Box 370  
Helper, Utah 84526

Re: Conditional Approval of Mitigation Plan for Sinkhole #23, Lodestar Energy, Inc., White Oak #1 Mine, C/007/001-02B-1, Outgoing File

Dear Mr. Miller:

The above-referenced amendment is conditionally approved upon receipt of the necessary clearance relative to a Goshawk survey in the affected area of Boarding House Canyon, and (7) clean copies for incorporation. Once we receive these copies, and the necessary raptor clearance from the USDA / Manti-LaSal National Forest, we will send a stamped incorporated copy to you for insertion into your copy of the Mining and Reclamation Plan. A copy of our Technical Analysis is enclosed for your information.

If you have any questions, please call me at (801) 538-5325 or Pete Hess at (435) 613-5622.

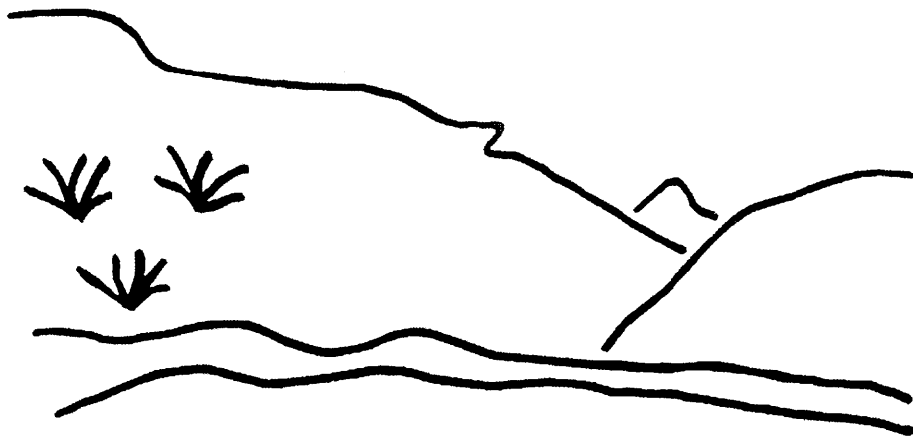
Sincerely,

A handwritten signature in black ink that reads "Daron R. Haddock".

Daron R. Haddock  
Permit Supervisor

PHH/sd  
Enclosures  
cc: Price Field Office  
P:\GROUPS\COAL\WP\007001.WO\FINAL\CONDAPP02B-1.DOC

# State of Utah



## Utah Oil Gas and Mining

### Coal Regulatory Program

White Oak Mine  
Mitigation Plan for Sinkhole #23  
C/007/001-02B-1  
Technical Analysis  
August 30, 2002

## TABLE OF CONTENTS

---

<b>INTRODUCTION</b> .....	3
<b>ENVIRONMENTAL RESOURCE INFORMATION</b> .....	5
HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION .....	5
<b>OPERATION PLAN</b> .....	7
<b>SUBSIDENCE CONTROL PLAN</b> .....	7
Subsidence Control Plan.....	7
<b>RECLAMATION PLAN</b> .....	9
APPROXIMATE ORIGINAL CONTOUR RESTORATION.....	9
TOPSOIL AND SUBSOIL.....	10
Redistribution.....	10
REVEGETATION .....	11
Revegetation: Mulching and Other Soil Stabilizing Practices.....	11
STABILIZATION OF SURFACE AREAS .....	11

## TECHNICAL ANALYSIS

---

### TECHNICAL ANALYSIS

The Division regulates the Surface Mining Control and Reclamation Act of 1977 (SMCRA). When mines submit a Permit Application Package or an amendment to their Mining and Reclamation Plan, the Division reviews the proposal for conformance to the R645-Coal Mining Rules. This Technical Analysis is such a review. Regardless of these analyses, the permittee must comply with the minimum regulatory requirements as established by SMCRA.

Readers of this document must be aware that the regulatory requirements are included by reference. A complete and current copy of these regulations and a copy of the Technical Analysis and Findings Review Guide can be found at <http://ogm.utah.gov/coal>

This Technical Analysis (TA) is written as part of the permit review process. It documents the Findings that the Division has made to date regarding the application for a permit and is the basis for permitting decisions with regard to the application. The TA is broken down into logical section headings which comprise the necessary components of an application. Each section is analyzed and specific findings are then provided which indicate whether or not the application is in compliance with the requirements.

Often the first technical review of an application finds that the application contains some deficiencies. The deficiencies are discussed in the body of the TA and are identified by a regulatory reference which describes the minimum requirements. In this Technical Analysis we have summarized the deficiencies at the beginning of the document to aid in responding to them. Once all of the deficiencies have been adequately addressed, the TA will be considered final for the permitting action.

It may be that not every topic or regulatory requirement is discussed in this version of the TA. Generally only those sections are analyzed that pertain to a particular permitting action. TA's may have been completed previously and the revised information has not altered the original findings. Those sections that are not discussed in this document are generally considered to be in compliance.



## INTRODUCTION

---

### INTRODUCTION

During May of 1986, Valley Camp of Utah was developing entries from the upper O'Connor coal seam through the interburden in an attempt to access the lower O'Connor seam in a section of the mine known as 3<sup>rd</sup> Left off of 3<sup>rd</sup> East Declines. In order to access the lower O'Connor, the permittee knew it had to cross a fault with a fairly significant displacement to obtain access to the reserves on the other side. Ground control issues developed, then eventually worsened to the point that when the right hand entry of the three-entry development encountered the fault, a roof anomaly occurred, material flowed from the mine roof into the entry to a height twenty feet above the coal seam. This chimney subsidence was discovered as a surface impact in June of 1988, at which time it was fenced off.

Surface impact #23, as it became designated, was monitored over the next thirteen years as part of the permittees annual subsidence reporting requirements. Permittee's have changed several times, with Lodestar Energy, Inc. becoming the current permittee. During that time period, the impact started to self-heal, with no impacts to wildlife or public safety.

On October 15, 2001, the involved surface management agency (USDA / USFS / Manti-LaSal National Forest) sent the Division a letter identifying surface impact #23 as a "significant safety hazard". This resulted in representatives from the permittee, the Forest Service, and the Division inspecting the impact on June 28, 2002. The outcome of that meeting was that the permittee was required to submit plans to mitigate the damage to meet the requirements of Federal law and the R645 coal rules. The submittal received August 6, 2002 is the proposal designed to mitigate the impact.

This plan should be conditionally approved pending receipt of the goshawk information from the US Forest Service.

Page 4  
C/007/001-01B-1  
August 30, 2002

## INTRODUCTION

---

**ENVIRONMENTAL RESOURCES INFORMATION**

---

**ENVIRONMENTAL RESOURCE INFORMATION**

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

**HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.12; R645-301-411.

**Analysis:**

The Manti-LaSal National Forest has provided a copy of the clearance document relative to the evaluation of the surface impact #23 area for historic and archeological resources. A determination was made that "no historic properties (were) affected". This document is included as a part of this review.

**Findings:**

The requirements of R645-301-411.140 have been adequately addressed.



Page 6  
C/007/001-01B-1  
August 30, 2002

**ENVIRONMENTAL RESOURCE INFORMATION**

---

**OPERATION PLAN**

---

**OPERATION PLAN**

**SUBSIDENCE CONTROL PLAN**

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

**Analysis:**

**Subsidence Control Plan**

The aforementioned regulation allows the Division to request information "as necessary to demonstrate that the operation will be conducted in accordance with R645-301-525.300".

There is no mention made of what method of monitoring will be used to monitor the repair of surface impact #23 in the permittee's August 6, 2002 submittal. However, as required by the Utah coal mining rules, a subsidence-monitoring program is described on page 500-10 of the approved mining and reclamation plan. "Monitoring of the subsidence control points and the overlying surface will occur until no longer deemed necessary by the Division and the concerned surface management agency".

The monitoring of the repaired impact should be performed post-snow melt, such that any settling of the material or erosion of the area can be monitored. A post snowmelt evaluation would allow time for preparation to make any necessary repairs of the area before the following snow season.

The 8/06/2002 submittal fails to address how much damage will need to occur before an additional repair may be felt to be necessary. However, the annual monitoring of the impact in the spring, and adequate documentation should provide sufficient evidence to make this call when and if necessary. That decision will be jointly made via the permittee, the Division, and the surface management agency.

Monitoring of the repair should occur at least once a year, and continue through Phase 3 bond release and lease relinquishment. Page 500-10, Volume 1, of the currently approved mining and reclamation plan (See **SUBSIDENCE MITIGATION PLAN**) makes the commitment "to repair any mining induced subsidence to the extent economically and technologically feasible". This commitment is acceptable to repair surface impact #23 again, should the need arise.

**Findings:**

The information provided is adequate to address the intent of the R645 coal rules.

## RECLAMATION PLAN

---

# RECLAMATION PLAN

## APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

### Analysis:

The submittal contains cross sections that depict a final surface configuration of a slightly concave depression, which will be tapered on the south end so that water will not impound. All fill material will be placed within the void, so stability concerns relative to lateral movement will not be an issue. If the weight of the fill material causes additional funneling into the mine, the annual subsidence evaluation will assess same, and further filling would be required.

This impact is not a highwall situation, as the upper O'Connor coal seam is approximately 240 feet below.

The material in the backfilled area will not exceed any angle of repose, as the fill will be placed to repair a sinkhole. No fill will exist above the edge of the hole. The material will remain static, as the incised configuration of the embankments will hold it in place. Compaction of the material will be achieved by tamping same with the back of the backhoe bucket as it is placed. Additional compaction will be achieved by the weight of the material bearing on the lower fill. The total maximum depth of fill is projected to be nine feet (See Section D-D, Plate B, Appendix RP-1). The fill material will consist of subsoils, with topsoil placed at the surface. This material will absorb and retain some moisture, but excessive pore pressures will not build due to the moderate draining nature of the soils, and the fact that the only precipitation that the impact will receive is that which falls directly upon it. As noted on Page 3, Appendix RP1, under **Sediment Control**, logs may be placed on the slope above the impact to redirect sheet flows from the upper slope around the reclamation area. The area fill has been designed to drain toward the down slope side (southern end); **therefore, "pocking" will not be practiced.** The only roughening that will occur will be that which occurs as the material is placed, and compacted by the bucket of the hoe. This effort to minimize the impounding nature of the final surface will help prevent slides. The relatively free draining material will sustain a high coefficient of static friction. There are no slip planes in the area, which, with pore pressure build-up, could allow the material to slide. The maximum slope angle determined from the examination of Section A-A for the fill is 2.53H / 1V. As mentioned elsewhere, the final surface configuration of the fill is slightly concave; therefore, the finished slope of the fill will actually be more gentle than the calculated 2.53H / 1V.

## RECLAMATION PLAN

---

Sediment and erosion control are provided utilizing the following methods; Curlex matting will be placed over the topsoil to reduce raindrop impact and hold soil in place during periods of wind. Lastly, felled Aspen trees will be strategically placed on the surface upslope of the repair as an attempt to reroute undisturbed drainage around the repair.

The proposed backfilling and grading plan supports the approved post-mining land use, which is the same use as that sustained during the mine's operational phase.

### **Findings:**

The information provided is adequate to meet the intent of the R645 coal rules as they relate to backfilling, grading, and the establishment of approximate original contour.

## TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

### **Analysis:**

#### **Redistribution**

The submittal, Appendix RP1-1, indicates, "topsoil in the area surrounding the sink hole will be pulled back in a depth ranging from 10 to 20 inches. This material will be reserved for placement after rough filling of the sinkhole." Although there is no mention made of the grubbing off of the vegetation (the area is covered with thick grasses), page 3 of the submittal indicates (See **Topsoil Collection**) the entire process will only take one day. Therefore, the grass clumps remaining in the salvaged topsoil will enhance the revegetation process as the grass will be quickly able to re-establish itself (roots will not dry from prolonged atmospheric exposure).

Should the removed topsoil be exposed for a long period, the submitted plan commits to "a sediment fence will be installed on the downhill side of the collected topsoil in order to complete the project", (preserve the resource).

### **Findings:**

The submitted information is adequate. The requirements of the R645 coal rules have been met.

## RECLAMATION PLAN

---

### REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

#### Analysis:

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

Following the backfilling and contouring process, the stored topsoil will be dispersed over the area. Curlex matting will provide sediment control on the impacted area to reduce the contribution of suspended solids to the undisturbed drainages in the area. As discussed above, grass clumps remaining in the recovered topsoil, as well as seeding will enhance the revegetation process. This area receives ample amounts of precipitation during a normal year; therefore, the re-establishment of a protective cover over the impact should occur quickly.

Page 2 of Appendix RP1 includes Table 1, which is a seed mix for SI #23, as recommended by the USFS. Broadcast methods will be utilized to disperse the varieties specified in Table 1 in the prescribed amounts. The mix must be certified as "weed free" and contain 99 percent pure live seed containing a maximum of 1% weed, none of which are noxious. This is a USFS requirement.

The permittee anticipates that it will take a maximum of four days to complete this project from accessing the site to revegetating it, and then, retreating from the area.

#### Findings:

The information provided is adequate to address the requirements of the R645 coal rules.

### STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

#### Analysis:

"All exposed surface areas shall be protected and stabilized to effectively control erosion and air pollution attendant to erosion. Rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved post-mining land use or the reestablishment of the vegetative cover, or, cause or contribute to a violation of water quality

## RECLAMATION PLAN

---

standards for receiving streams, shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted.”

The permittee has submitted a permit amendment that consists of what has been designated as **Appendix RP1-1**. This appendix includes verbiage that describes how machinery capable of handling the necessary work will access the impact without creating a more extensive disturbance, (i.e., cutting a road). The current impact is fifty feet in length, parallel with the dip of the seam, with a maximum width of thirty feet along the strike.

It is the permittee's intent to access the impact from Boarding House Canyon utilizing a 325-track hoe or similar machine. A spring (S36-17) may need to be crossed to access the impact. Should that be the case, Aspen logs will be placed parallel with the drainage to minimize the destruction of the vegetation along the channel. After the reclamation of the impact has been completed, the logs will be removed by the retreating machine.

The area is heavily forested with Aspen as well as conifers; it will be necessary to remove some trees to access the impact. This will be accomplished by either removing them via cutting, or by knocking them down with the boom/bucket of the hoe. Topsoil will be recovered about the circumference of the sinkhole to a depth ranging from ten to twenty inches. This will be placed in a temporary storage pile adjacent to the site in order to expedite replacement.

Subsoil will then be recovered according to the depths specified on Plate B of Appendix RP1. The drawing depicts a longitudinal cross section A-A and three lateral cross sections, B-B, C-C, and D-D.

### Cross Section A-A (longitudinal)

A cut approximately twenty-seven feet long ranging from zero to 3.5 feet in thickness will be made on the downslope side on surface impact #23 in order to provide the necessary volume of fill to return the void to approximate original contour. Although the surface of the repair will be slightly concave, moisture entrapment should be minimal as the fill and the subsoil inter face meet at the same elevation. Some settling of the fill will naturally occur, particularly if the area receives a normal snow pack this winter.

The circumference of the disturbance will be extended approximately 25 feet down the slope. The depicted cuts do not appear to make enough fill, but the certifying professional engineer involved explained that the capability of the Serv-Cad computer program is limited by the fact that only one longitudinal cross section was made. The size of the impact is the limiting factor here. The submittal contains mass-balance calculations to support the cut and fill volumes depicted on Plate B. This reviewer feels that since this project involves a very small volume of material (250 cubic yards) and the permittee has committed to fill the void up to the level of the impact's rim, enough material will be gathered to properly fill the void. The permittee must be

---

RECLAMATION PLAN

---

allowed to have some flexibility in filling the void. It is possible, that when the additional weight of the backfill bears upon the original surface of the sink, that additional failure into the mine could occur.

The plan view depicting the location of all four submitted cross sections depicts both the surface perimeter of the void as well as the extent of disturbance that must be created to make enough fill to eliminate the impact. The disturbance necessary to make enough fill to mitigate the void appears to be at least triple the surface area of the original impact.

**Cross Section B-B** (lateral section #1, on upslope end of the void)

Cross section B-B transects A-A fifteen south of the north edge of the disturbance. A cut nine feet long tapering from zero to a maximum of one foot in thickness will be made on the east slope. A second cut will be made on the west slope 26 feet in length tapering from zero to a thickness of two feet. The final surface configuration will be a very mild depression (concave) that will approximate the original contour of the area.

**Cross Section C-C** (lateral section #2)

Cross section C-C bisects A-A thirty feet from the northern edge of the disturbance. SI #23 is depicted in the plan view having almost a rectangular shape, with rounded corners. The corners on the north end are more blunt than those on the south, which blend to the center in a more pleasing fashion. Cuts will be made on the east and west slopes in the following manner; the east slope will be tapered for a distance of seventeen feet, varying from zero to 3.5 feet in depth. The west slope will be tapered back to the west a horizontal distance of thirty-three feet. Depth of this taper will vary from zero to a maximum depth of five feet.

The final surface configuration of Cross Section C-C will also be a very mild depression that will approximate the original surface contour.

**Cross Section D-D** (lateral section #3)

Cross Section D-D is the southern most trans-sect of A-A, and is located approximately eleven feet north of the south end of the impact. As with the other cross sections, tapered cuts will be made on the east and west slopes, as well as the area about the southern perimeter of the impact. D-D depicts the deepest area of the impact, as this is where the funneling effect of the in-mine roof fall propagated to the surface. A tapered cut twenty-one feet long having a maximum depth of two feet will be made on the east slope. A similar cut (32 feet long, varying in depth from zero to three and a half feet) will be made on the west bank to provide the necessary fill.



## RECLAMATION PLAN

---

As with all other sections, the final surface configuration of the backfilled area will be a slightly concave area that will blend in to achieve approximate original contour.

### **Findings:**

The information provided is adequate.