



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

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**TO:** Daron Haddock, Permit Supervisor

**FROM:** Wayne H. Western, Senior Reclamation Specialist *WHW*

**RE:** Phase I Bond Release Sowbelly Canyon, Amax Coal Company, Castle Gate Mine, ACT/007/004, Folder #2, Carbon County, Utah

**Synopsis:**

On October 22, 1996, representatives from DOGM, OSM and the operator visited Sowbelly Canyon. The purpose of the inspection was to determine if the operator had met the minimum requirements for Phase I bond inspection. Upon completion of the inspection DOGM found that the Operator had met the requirements for Phase I bond release.

**Impoundments:**

**Analysis:**

There are no permanent impoundments at the site. Some depressions were left for water retention, minimize erosion and to assist revegetation. Such structures are allowed to be retained under R645-301-552.100.

**Findings:**

Since there are no impoundments on the site this issue is not applicable.

**Small Depressions or Livestock Water Facilities:**

**Analysis:**

There are no livestock watering facilities at the site. However, several small depressions were left to retain water and enhance revegetation. The depressions meet the requirements of R645-301-552.100 and therefore may be retained.



**Findings:**

The operator has met the minimum requirements for retaining small depressions.

**Postmining Land Use Facilities Appear To Be Functional and Capable of Supporting the Intended Post Mining or Alternative Post Mining Land Use Criteria**

**Analysis:**

No facilities were left on the site.

**Findings:**

This criterion is not applicable.

**Remaining Highwalls Meet Highwall Retention Criteria**

**Analysis:**

Some highwall remnants were left exposed. The Division allowed the highwall remnants to remain because the permittee had demonstrated that all the requirements of R645-301-553.600 through R645-301-553.612 had been met. R645-301-553.600 allows for highwalls retention if they were constructed prior to the passage of SMCRA and there is insufficient spoil to reclaim the highwalls. The Division has determined that the highwalls in Sowbelly Canyon were constructed prior to the passage of SMCRA.

R645-301-553.610 through R645-301-553.612 requires that the Division make a determination that all reasonably available spoil material in and adjacent to the disturbed area be used to eliminate the highwalls. The Division's inspectors did not observe any spoil in the disturbed area that was not used as backfill. Nor, is there any indication of any spoil material in the surrounding areas. The Division has determined that all reasonably available fill was used to backfill the highwalls. However, there was an insufficient volume of spoil to completely eliminate all existing highwalls. The highwall remnants that do remain appear to be stable and are similar to naturally occurring cliffs and ledges in the area.

**Findings:**

The permittee has met all the requirements of R645-301-553.600 through R645-301-553.612. Some highwall remnants were allowed to remain because they were constructed prior to the passage of SMCRA and there is an insufficient volume of reasonable available spoil material to reclaim all the highwall remnants.

### **Disturbed Areas Tie In Smoothly With Adjacent Undisturbed Areas**

#### **Analysis:**

The disturbed area was backfilled and graded so that it blends in with the undisturbed area. In a few areas the boundary is marked by a short cut slope. The cut slopes were left because there was not enough material to completely backfill the site or that additional fill would cause the slopes to become unstable or that the drainage would be filled in. The cut slopes are no more than a few feet high and blend in the general topography.

#### **Findings:**

The operator has met the minimum requirements.

### **Cut Slope and Steep Slope Areas Remaining Appear Stable and in Accordance with AOC Requirements**

#### **Analysis:**

The permittee proposed to leave some cut slopes because there was either not enough reasonable available spoil or the slope stability requirements could not be met. The Division has reviewed the permittee's backfill and grading plan and determined that there was insufficient slope material to eliminate all cut slopes. When the permittee was doing reclamation the inspectors routinely visited the site and observed the amount of spoil material that was excavated. Neither the permittee nor the Division noticed any additional source of spoil material during earthwork activities.

The natural slope angle for most of the slopes in and around the disturbed area is the angle of repose. The safety factor for most slopes that are constructed at their angle of repose is 1. To increase the safety factor the slope angle must be reduced. The only way to effectively reduce the slope angle is to place more material on the slopes. The Division will not require the permittee to place additional material on the slopes since none is reasonably available. Most of the natural slopes in the area consist of bedrock covered by a few feet of soil. If slope failure were to occur, it would most likely be minor sluffing. The bedrock would prohibit deep-seated rotational failure.

The cut slopes are similar to naturally occurring ledges in the area. The topography of the reclaimed area is similar to that of the surrounding landscape. The Division has determined that the permittee has met the requirements to restore the area to the approximate original contours.

**Findings:**

The operator has met the minimum requirements.

**Surface Devoid of Sink Holes or Cracks**

**Analysis:**

During the inspection the DOGM staff and OSM representatives walked over most of the sites. The area appears to be stable. No cracks or sinkholes were observed during the inspection.

Mining ceased several years ago. There are only a few small areas that have mine workings beneath them. If those workings were going to subside, they most likely would have by now and the surface features associated with subsidence would have appeared. Most of the backfilling and grade were done in the summer of 1995. If the soil was to settle in a way that would cause surface cracks or sinkholes it would have done so by now. Soil has had time to settle. It is not anticipated that much more soil settling will occur. Based on field observation the Division has determined the area to be stable.

**Findings:**

The operator has met the minimum regulatory requirements.

**Mine Openings, Wells and Other Boreholes Backfilled, Sealed or Cased as Required**

**Analysis:**

The mine portals have been properly sealed and backfilled. The seals consisted of cinder blocks located 25 feet from the opening. The portals have been backfilled from the surface to the seals and four feet of material has been placed over each portal.

**Findings:**

The operator has met the minimum regulatory requirements.