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DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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October 25, 2000

TO: [REDACTED]

THRU: Daron R. Haddock, Permit Supervisor *DRH*

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

RE: Determination That the Willow Creek Mine Site Can Be Reclaimed to the Approximate Original Contours With Emphasis On the Cut Slopes on the Schoolhouse Canyon Road, Plateau Mining Corporation, Willow Creek Mine.  
[REDACTED]

**SUMMARY:**

On April 13, 2000, OSM and DOGM officials meet with the permittee of the Willow Creek Mine on-site to discuss reclamation of highwalls and cut slopes. OSM had a general concern about how the site would be reclaimed to meet the approximate original contour requirements and a specific concern about the cut slopes along the access road to the School House Canyon refuse pile. This memo will address those deficiencies.

**RECLAMATION PLAN**

**APPROXIMATE ORIGINAL CONTOUR RESTORATION**

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -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 three general requirements for restoring a mine site to the approximate original contour are (1) highwall elimination, (2) the reclaimed drainages compliment the natural drainages and (3) the reclaimed topography is stable, closely resembles the general surface configuration and blends into the surrounding topography.

TECHNICAL MEMO

All portals associated with the Willow Creek Mine are at the mine site. Map 21A shows the postmining contours for the Willow Creek Mine and Map 22 shows the cross sections. The cross sections show the elimination of all highwalls. **During the joint inspection all parties agreed that complete highwall elimination would occur during reclamation. Therefore, the site meets the highwall elimination requirement associated with restoring the site to the approximate original contours.**

The reclaimed drainages were not a major topic of discussion during the joint inspection. OSM did have concerns about how the restored drainage near the refuse pile access road would be restored. They cited R645-301-762 for the following requirements:

- All roads not to be retained for use under an approved postmining land use are reclaimed by restoring the natural drainage patterns.
- All cut and fill slopes are reshaped to be compatible with the postmining land use and to complement the drainage patterns of the surrounding area.

The Division reviewed the drainage plan and determined that the reclaimed drainages complement the natural drainages. The steep topography of the area dictates that the permittee restores the drainages to the approximate premining location. The drainage patterns for the premining and postmining contours are the same. In both cases water will flow into or on the surface until it reaches a stream channel. Water in the streams will flow into either the Price River or Willow Creek, which is a tributary to the Price River.

The 3<sup>rd</sup> AOC requirement is that the reclaimed topography be similar to the premining contours and blend into the surrounding topography. OSM pointed out in the joint inspection that R645-301-553.110 requires that all disturbed areas be backfilled and graded to the approximate original contour.

Most of the sites except Schoolhouse Canyon and Barn Canyon were disturbed before the passage of SMCRA. The flat area in the preparation plant area was once part of the city of Castle Gate, which was later moved. The Willow Creek mine site was once the mine site for the Castle Gate mine and Jap Town. The mine facilities and town site were reclaimed before the Willow Creek mine facilities were developed. Because of pre SMCRA activities, the permittee is unable to reclaim most areas to the pre disturbed contours.

Drawing 3.4-1, Pre-SMCRA Disturbance and Surface Facility Map, shows the cut slope for the Schoolhouse refuse pile is outside the pre SMCRA disturbance area. **However, in the Golder Associates Report in Appendix 3.4A mention is made of a dozer trail in the location of the present haul road made before 1977.**

The description of the dozer trail includes cuts into the bedrock. While the exact extent of the dozer trail is unknown part of the cut slope is pre SMCRA. The Division contacted Vickie Miller who found other documents in the permittee's files that show a road existed to the

Schoolhouse refuse pile existed before 1977. **The pre-SCMRA maps incorrectly show the cut slope for the Schoolhouse refuse pile road to be outside the pre-SMCRA disturbed area.**

The Utah coal rules do not differentiate between reclaiming pre and post SMCRA cut slopes. However, the Utah coal rules do allow pre-SMCRA highwalls to be reclaimed to a lesser standard than post-SMCRA highwalls under some circumstances. See R645-301-553.500 and R645-301-553.500 for details. Therefore, the Division will allow pre-SMCRA cut slopes remnants to remain when full reclamation is not practical.

The Division did approve reclamation topography what would allow the site to blend into the surrounding area. The topography for the area surrounding the Willow Creek site consists of a river valley ringed by steep mountain slopes. Most of the sites will be reclaimed to a gently steeping river valley.

The mountain slopes in and around the Willow Creek mine are at the natural angle of repose, which is approximately  $35^{\circ}$ . The safety factor for slopes at the angle of repose is slightly higher than 1.0. Since R645-301-553.100 requires that the reclaimed slope have a safety factor of 1.3, it is necessary that the reclaimed slopes be gentler than natural slopes. Therefore, the permittee cannot restore the areas on steep slopes to the premining conditions.

Because the reclaimed slopes must be gentler than the premining slopes, the permittee must either leave a cut slope or import more fill. Generally importing large amounts of fill to eliminate cut slopes is not prudent.

The cut slope remnants are artificial features that will be seen after reclamation has been completed. However, the cut slope remnants are similar to natural cliffs in the area. They are similar because both will consist of bare rock with steep slopes.

The cut slopes and surrounding topography are shown on Figure 1. The cut slope remnants will be similar but smaller than the natural cliffs in the area. The cut slope remnants that will remain after reclamation is similar to those that have already been approved by the Division and OSM at other sites.

The final reclamation contours are shown on Map 3.4-10, Castle Gate Preparation Plant Final Reclamation Topography Map. The map has a scale of  $1" = 200'$  and contour intervals that range from 5' to 10'. Much of the area is in steep terrain that limits the contour intervals that can be shown.

The cut slope remnants are not specifically identified on the reclamation map, Map 3.4-10. The maximum extent of the cut slopes will be approximately 10-20 feet high and 200-400 feet long. Natural cliffs in the area are up to 50 feet high and 1000 feet long. The height and length of the cut slope is the same as those already approved by the Division. Other government agencies allow cut slopes of similar dimensions to remain after reclamation.

**TECHNICAL MEMO**

OSM reviewed the Utah coal rules for road closure requirements and how those rules should be applied to cut slope reclamation. They believe that the two rules most applicable for reclaiming the refuse pile access road are R645-310-553 and R645-301-762. However, R645-301-542.600 deals specifically with road reclamation and requires the permittee to do the following:

- Reclaim all roads that will not be used under the approved postmining land use.
- Close the road to traffic.
- Remove all bridges and culverts not needed for the postmining land use.
- Scarify or rip the roadbed and replace topsoil and revegetate the disturbed surface.
- Remove the road-surfacing materials that are incompatible with the postmining land use and revegetation requirements.

The requirements of R645-301-542.600 will be met because the permittee will do the following:

- Reclaim the refuse pile access road because it is not needed for the approved postmining land use.
- During reclamation the permittee has committed to close the road to traffic, replace topsoil and revegetate the area.
- Since the access road has a dirt surface, the permittee does not have to dispose of the road surface.

The term cut slope does not appear in the reclamation section of the Utah coal rules, but is mentioned in R645-301-537.100. That regulation deals with regraded slopes. While the access road to the refuse pile is not considered a regraded slope, the regulations do give some guidance for cut slope retention.

The main requirement for cut slope retention is that the slopes are geotechnically stable. Figures 1 and 2 show the road cut was made in bedrock. The Division considers cut slopes in bed rock to be stable unless shown otherwise. The cut slope has existed for 23 years and there is no sign of instability.

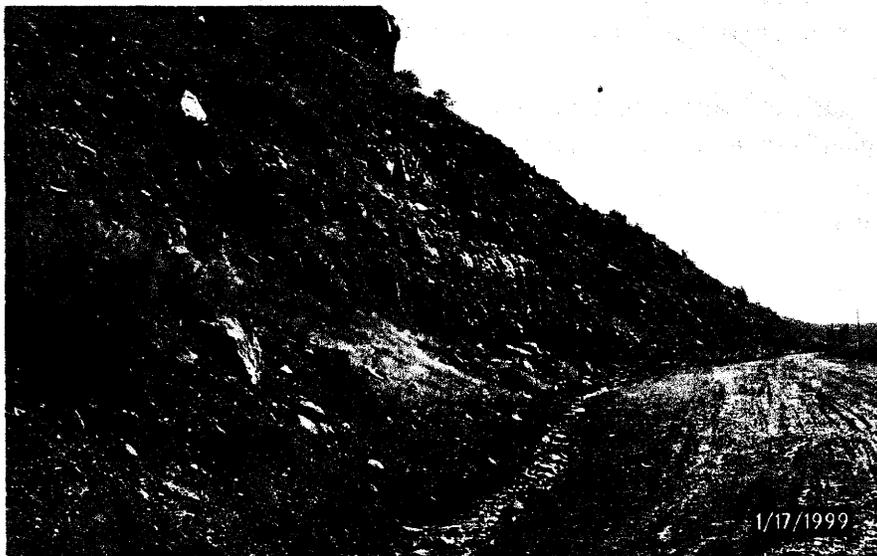
The Division finds that the reclamation plans for the access road to the Schoolhouse refuse pile meet the AOC requirements because (1) no highwalls are associated with the reclaimed access road, (2) the cut slopes will not cause drainage problems, (3) the cut slopes will be backfilled to the extent practical and blend into the surrounding topography and achieve a long term stable configuration.

**Findings:**

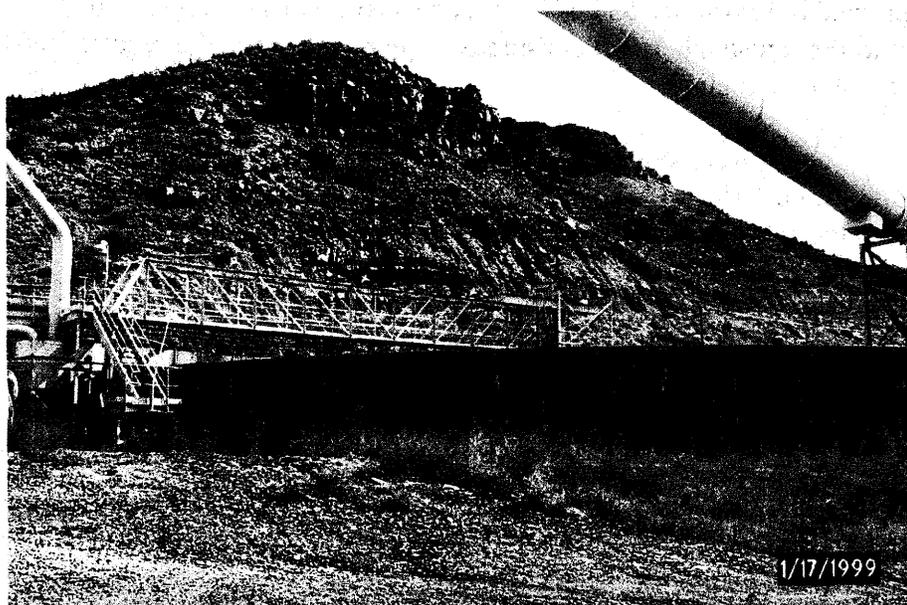
The permittee has met the minimum requirements of this section

**BACKFILLING AND GRADING**

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



**Figure 1**



**Figure 2**

**TECHNICAL MEMO**

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**Analysis:**

The general backfilling and grading requirements are: (1) achieve AOC, (2) eliminate highwalls, spoil piles and depressions, (3) achieve a postmining slope that does not exceed either the angle of repose or such lesser slopes as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides, (4) minimize erosion and water pollution and (5) support the approved postmining land use.

The Division determined that the reclaimed access road to the Schoolhouse refuse pile will meet AOC requirements, and that there are no highwalls, spoil piles or depressions associated with the site. See the AOC section of this memo for details. The Division made findings in the TA that the reclaimed site would minimize erosion and water pollution and support the approved postmining land use. The only issue that needs to be addressed is slope stability.

The premining slope consisted of bedrock with overlying soil. The natural slope was 30° to 35° that implies that the soil section had a safety factor of slightly more than 1.0. To achieve a safety factor of 1.3 the permittee would have to place backfill at the top of the cut slope and grade the slope at a 2H:1V angle or leave stable cut slope remnants.

Many coal mines in Utah are in steep valleys. The Division has studied the problem of road reclamation on steep slopes and found that sometimes a cut slope remnant must be left. In such cases the cut slope remnant is in bedrock and it has safety factors greater than 1.3.

Figure 2 shows the cut slope for the access road. The cut slope was made in bedrock, which will remain stable in the present configuration.

The cut slope remnant that will remain after reclamation is similar to those that have already been approved by the Division and OSM at other sites.

**Findings:**

The permittee has met the minimum requirements of this section.

**RECOMMENDATIONS**

The Division finds that the reclamation plan for the road to the Schoolhouse refuse pile adequate. The finding should be based on the permittee meeting the AOC and general backfilling and grading requirements for the site. The Division documented that the permittee met those requirements in the analysis section of this memo.