



**Office of Surface Mining
Reclamation and Enforcement
Western Region**



**Approximate Original Contour
National Priority Oversight Evaluation
For New Mexico**

June 2, 2010

Introduction

The Office of Surface Mining Reclamation and Enforcement (OSM) selected State implementation of approximate original contour (AOC) and backfilling and grading regulations as a national priority oversight topic to evaluate the effectiveness of state regulatory programs in enforcing their own regulations that require mine operators to reclaim lands affected by coal mining operations to AOC. The OSM Western Regional Office (WR) was tasked with evaluating state programs in Alaska, Colorado, Montana, New Mexico, North Dakota, Utah and Wyoming. WR evaluated 20% of all coal mines up to a maximum of five (5) mines per state (including all active and reclaimed mines) that were representative of all “typical” mining environments and conditions with each state to determine the effectiveness of the State program and the State staff’s implementation of its approved program.

Specifically, OSM used three general aspects to evaluate how each state implements its rules and regulations relating specifically to AOC. The three aspects are: 1) AOC interpretation and permitting documentation evaluation; 2) evaluation of processes for on-the-ground AOC verification; and 3) field verification that backfilling and grading are following the approved mine/operations plan.

Evaluation Methodology Used by the Western Regional Office Team

The National Priorities Review AOC group provided the WR evaluation team provided with several baseline questions aimed at guiding each oversight inspector in conducting a standardized evaluation of each state’s program for implementing AOC at the mines it regulates. The baseline questions direct the inspector to collect information on the relationship between OSM, the public, and the specific state, information on the state program as it interprets and evaluates AOC according to its own rules and regulations. Also, the baseline questions provide a framework to enable the field evaluator to measure AOC conditions at the specific mine site.

Approximate Original Contour Evaluation

During each State AOC oversight inspection the WR Team met with the State permit coordinators for each mine to discuss programmatic policies relating to the State’s interpretation and implementation of AOC. During this discussion, the Team asked baseline questions aimed at evaluating the State’s pre-existing agreements and relationships with OSM regarding implementation of AOC, systematic measures the State employs to approve and verify AOC at a mine, and determine if there has been any public commentary or complaints relating to AOC and post-mine land use and if there have been any actions resulting from the public feedback. The Team then reviewed language within each permit as it relates to the State program regulations and rules for AOC. This review focused on several aspects of each permit, including evaluation of backfill and grading practices, review of stream channel reconstruction designs and site hydrology, review of any special conditions at the mine, such as retention of bluff features, valley fills, and documentation of prime farmlands or alluvial valley floors (AFV). The Team closely examined data that compared pre and post-mining conditions, including pre-

and post mine terrain figures, pre and post-mine slope and aspect comparisons, and pre and post-mining watershed density. The Team also closely considered the restoration of each mine to an AOC in context of the post-mining land use projections at each mine. Finally, the Team evaluated each permit to determine if there were any approved variances from AOC at each respective mine and the approved justification for the variance was documented; cases where mines have classified excavated materials as excess spoil were noted by the Team as a variance and any data supporting the classification of these materials as excess spoil was included in the description of these variances.

Field Evaluation

As part of the field evaluation process, a WR Team member met with the State permit coordinator to identify areas on the mine site that have been reclaimed to AOC requirements. The OSM representative and the coordinator identified representative areas, including drainages, slopes with multiple aspects, and planar surfaces, that would be suitable for AOC evaluation. The OSM representative then physically verified the elevation of the topography by walking transects, making visual observations of AOC and channel reconstruction, and gathering relevant location and elevation data using GPS equipment (Trimble GeoXH).

New Mexico

The OSM WR Team reviewed the State of New Mexico Minerals Management program for implementation of AOC at one mine site. The Team conducted a permit review and field verification visit for the McKinley Mine, an active coal mine.

AOC Findings

Currently, there are no formal agreements between OSM and New Mexico regarding defining and implementing evaluation of AOC; however, New Mexico has a written method that guides their evaluation of AOC. OSM reviewed this document and has no objections to the State's use of it. New Mexico has adopted language that specifically identifies geomorphic reclamation principles as part of its guidance in approving post-mining terrain that is reclaimed to AOC. The State has not received any comments or citizen complaints relating to AOC or post-mining land use directed to the State program or OSM. Nor are there any outstanding required amendments or 30 CFR 732 letters related to AOC or post mining land uses associated with AOC waivers.

The State has a process for evaluating revisions and updates to mine permit reclamation plans and conducts on-site inspections to verify that post-mining terrain is reclaimed to AOC as approved in the mine permit reclamation plan. Additionally, the State requires annual reporting of reclamation progress including submission of as-built AOC terrain. The mine permit contained projected post-mine contour maps which were easily comparable to as-built contours provided in annual reports. No variances were granted for the permit that was evaluated by the Team.

The State regularly conducts on-site inspections of backfill and grading actions at the mines that it regulates and the State engineer verifies that any submitted post-mining terrain as-built agrees with the approved post-mining terrain depicted in mine permit reclamation plans. The State reviews backfill and grading data as part of its conditions for Phase 1 bond release. After conducting a detailed review, OSM found that the State of New Mexico's process for evaluation of mining permits is adequate to ensure that backfilled and graded areas will be reclaimed to AOC and that further follow-up action is not needed.

Field Verification Findings

The OSM Western Region Team conducted a field verification of lands reclaimed to AOC at the McKinley Mine in Gallup, New Mexico on March 16th 2010.

Field conditions for the inspection included clear skies and mostly-open ground with limited snow cover. In general, areas at the mine that were evaluated by the Team were reclaimed to AOC. This site had some minor differences in the placement of specific topographic features such as hills; however, the number of post-mine slopes seemed to match the pre-mine condition. Drainages have been reconstructed and blended to non-disturbed land. No significant differences between the as-built terrain and the approved post-mining terrain were noted and some unique topographic features were reconstructed to resemble pre-mining conditions. There did not appear to be a systematic problem with the State inspection program for AOC.

New Mexico Background Information:

1. Is there an agreement between the regulatory authority and OSM as to the interpretation of AOC as envisioned by Directive REG-8, Appendix 1?

Yes. There is no specific agreement between MMD and OSM regarding the interpretation of AOC. However, MMD has had a written method for evaluating compliance with AOC since 1987. Although not a regulation, OSM has been aware of this method and has never objected to MMD using it. MMD recently revised this document to provide guidance more specific to the evaluation of Geomorphic Reclamation as well as the more traditional techniques of cut and fill terraces.

2. Are there any outstanding program amendments or 30 CFR 732 letters related to AOC or post mining land uses associated with AOC waivers?

No.

3. Has OSM or the State received any citizen complaints related to AOC in the past 3 years and what was the ultimate outcome of the case(s)?

No.

State Verification of Backfilling and Grading:

1. Does the State have methods to check the operator's compliance with his backfilling and grading plan?

Yes. The state inspector usually verified the reclaimed area via the ocular method (by eye). He always carried a PMT map with him and suggested changes be made if he saw something that either didn't work or was incorrect per the approved map. The state engineer always verifies the submitted annual plan is approximate to the original approved PMT map. The engineer identifies changes to that plan if he sees anything outside of what had been discussed between the state inspector, the state engineer and the operator and then reports these changes to the operator for correction. The engineer makes a yearly (at least) trip to the mine to compare the map to what has been constructed on the mine site. If everything is okay, the engineer approves the annual plan.

2. Is the State routinely using these methods or verifying operator supplied information at some point prior to Phase I bond release?

Yes. The state receives annual maps from the company. The annual maps are submitted with 5ft contours (just like the PMT map). This map would be closely reviewed before any type of bond release could occur.

3. If grading problems are identified does the State require additional grading or permit revision?

Yes.

4. Has OSM done any spot checking of sites to verify compliance with the approved permit regarding backfilling and grading?

Yes, in conjunction with the following studies: "Contemporaneous Reclamation", 1998; "Final Pit Closures", 2003; and "Phase I, II and III Bond Release", 2006.

5. Based on the entirety of this process is there a need for further checking of on the ground conditions?

No.

Permit Review: McKinley Mine

1. Does the State have a process for applying its interpretation of AOC to evaluation of backfilling and grading plans, and is the process documented and reproducible from site to site?

Yes. The State has a method for the evaluation of compliance with the approximate original contour requirements of CSMC rule 19.8 NMAC. Modifications are minor revisions that do not change bond, mine method & acres. These revisions are approved or disapproved without a formal technical review with written findings. If the revision is not approved, then the deficiency letter is sent with the deficiencies listed. Revisions are not modifications and do have a formal technical review with written findings. The State also has AOC guidelines and a written method for the evaluation of compliance with the approximate original contour requirements of CSMC Rule 19.8 NMAC.

2. Does the State's interpretation of AOC appear to meet the State program definition of AOC?

Yes. The State of NM's interpretation of AOC does appear to meet the NM State Program and it follows the guidance referenced above.

3. Do the permit documents reflect the State interpretation of AOC? {Note: If the State grants variances to AOC, the review should include a sample of those permits with an AOC variance to determine if a reviewer could generally make a distinction between a permit returning to AOC and one granted an AOC variance. Also the reviewers should pay close attention to drainage patterns including the size of the watersheds before mining and that proposed by the regrading plans to determine if drainage patterns or watershed areas have been altered.}

Yes. The AOC is heavily driven by approximating the premining watershed characteristics. The AOC that NM approved for Area 10 was developed by re-constructing the premine watershed and restoring the ephemeral drainages that existed previously. By consulting heavily with the operator, NM was able to get the watershed characteristic that were appropriate for postmine conditions, while approximating the premine surface.

4. Are there sufficient cross-sections or contour maps in the permit to properly evaluate AOC?

Yes. The permit includes contour maps, but not cross-sections. The contour maps were sufficient. The operator also provided as-built contours in its Annual Reports that were helpful in seeing how close they were able to construct the surface to what was approved in the permit application.

5. If an AOC variance has been granted are the reasons documented and in accordance with regulatory requirements for that State and OSM's June 22, 2000 Post Mining Land Use Policy?

No variances were granted for the McKinley Mine.

6. Do you believe the States process for evaluating permits is adequate to ensure that backfilled and graded areas will achieve AOC?

Yes. The State regularly inspects the BF&G and requires the operator to submit an annual report that includes as-built contours.

Field Verification Report: McKinley Mine

1. Collect data using GPS, field surveys, or other appropriate methods on areas of the selected permits where backfilling and grading are complete.

The data for this site was collected on 3/16/10.

2. Based on the field data collected, was the site reclaimed to AOC in conformity with the approved mining and reclamation plan?

Yes. This site had some minor differences as far as placement of certain features such as hills, but, the same percentage of slopes seemed to exist pre and post mining. The drainages has been reconstructed and tied to non disturbed land very nicely.

3. If there are differences between the approved AOC configuration for the site and the actual land form following backfilling and grading, are these differences significant?

No. No significant differences were noted. A few features were constructed to resemble pre mining features. Slopes were gentler.

4. Do differences, if any, between land forms following backfilling and grading and the approved AOC configuration observed on the sampled sites indicate a systematic problem in the State's methods for checking operator compliance with the approved backfilling and grading plan?

No.