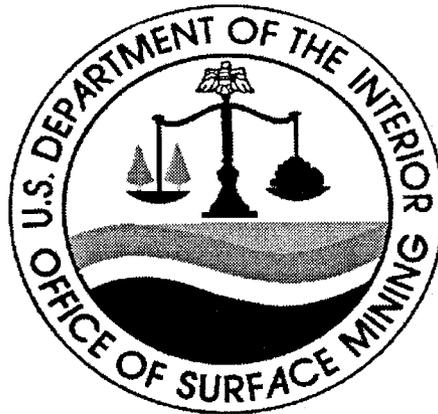


AN EVALUATION OF APPROXIMATE  
ORIGINAL CONTOUR VARIANCES AND  
POSTMINING LAND USES IN VIRGINIA



May 1999

## A Shared Commitment

A draft report  
prepared by the U. S. Department of the Interior,  
Office of Surface Mining,  
Big Stone Gap Field Office.

**AN EVALUATION OF APPROXIMATE  
ORIGINAL CONTOUR VARIANCES AND  
POSTMINING LAND USES IN VIRGINIA**

**May 1999**

**A draft report  
prepared by the U. S. Department of the Interior,  
Office of Surface Mining,  
Big Stone Gap Field Office.**

**DRAFT**

**May 10, 1999**

# CONTENTS

## EXECUTIVE SUMMARY

- 1. PURPOSE OF THIS REPORT ..... v
- 2. CONCLUSIONS AND RECOMMENDATIONS ..... vi

## GLOSSARY OF MINING TERMS

- State program ..... viii
- Approximate original contour ..... viii
- Types of mining applicable to this report ..... ix
- Mining-related terms ..... x

## CHAPTER A

- 1. INTRODUCTION ..... A-1
- 2. FEDERAL REQUIREMENTS ..... A-2
  - a. General AOC Requirements ..... A-2
    - 1. Statute ..... A-2
    - 2. Legislative History ..... A-3
    - 3. OSM's Treatment of AOC in Rules ..... A-6
  - b. Federal Requirements Relating to Mountaintop-Removal Mining Operations ..... A-7
  - c. Federal Requirements Pertaining to Steep-Slope Mining Operations ..... A-8
- 4. STATE PROGRAM REQUIREMENTS ..... A-9
  - a. General AOC Requirements ..... A-9
  - b. State Requirements Relating to Mountaintop-Removal Mining Operations ..... A-9
  - c. State Requirements Pertaining to Steep-Slope Mining Operations ..... A-12
- 5. REVIEW METHODOLOGY ..... A-13
  - a. Site Selection ..... A-14
  - b. Work Plan ..... A-17
- 6. FINDINGS AND ANALYSES ..... A-18
  - a. Approximate Original Contour (AOC) ..... A-18
  - b. Mine Classification and Inventory ..... A-23
  - c. Observed Postmining Land Uses ..... A-24
  - d. Steep-Slope Mining Operations With AOC Variances ..... A-27
  - e. Site Reclamation and Utility ..... A-27
- 7. CONCLUSIONS AND RECOMMENDATIONS ..... A-27
  - a. Approximate Original Contour (AOC) ..... A-27
  - b. Mine Classification and Inventory ..... A-28
  - c. Mountaintop Removal Mining And Steep Slope Operations With AOC Variances ..... A-28
  - d. Permit Documentation ..... A-29

CHAPTER B.  
EVALUATION REPORTS AND CROSS SECTIONS ..... B-1

APPENDIX I  
DMME/DMLR - OSM OVERSIGHT WORK PLAN ..... B-36

APPENDIX II  
OSM DIRECTIVE INE - 26, APPROXIMATE ORIGINAL CONTOUR ..... B-43

APPENDIX III  
LIST OF ONGOING VIRGINIA MOUNTAINTOP PERMITS AS OF  
NOVEMBER 1, 1998 ..... B-44

APPENDIX IV  
LIST OF MOUNTAINTOP AND AREA MINING PERMITS USED TO SELECT  
SITES FOR EVALUATION  
..... B-46

APPENDIX V  
VIRGINIA SURVEY FORM ..... B-49

## EXECUTIVE SUMMARY

(See the "Glossary of Mining Terms" for definitions of the terms used in this document.)

### 1. PURPOSE OF THIS REPORT

The Office of Surface Mining's (OSM) Big Stone Gap Field Office (BSGFO), in conjunction with the Virginia Department of Mines, Minerals and Energy, Division of Mined Land Reclamation (DMME/DMLR), has prepared this oversight report on portions of the Virginia surface mining program, which was approved on December 15, 1981, under the Federal Surface Mining Control and Reclamation Act of 1977 (SMCRA). The DMME/DMLR, which administers the regulatory program in Virginia, participated in gathering the data for this report and analysis.

This document addresses *mountaintop operations*, that is, those surface mines that remove all or a large portion of a coal seam or seams running through the upper fraction of a mountain or ridge. Some States in the Appalachian Region report an increase in mountaintop operations in recent years, both in number and scale, which may help explain the upsurge in the public's interest in such mines. As a result of increased public interest in West Virginia and Kentucky, OSM's Appalachian Regional Coordinating Center required all States in the region to include the study as part of their 1999 oversight activities. Upon conclusion of the Appalachian Regional Studies, OSM will determine if regulatory, policy, or procedural changes are needed either nationally or on a state specific basis. BSGFO and DMME/DMLR included mountaintop operations in the general oversight agreement they signed on November 13, 1998, even though very little public concern had been expressed in Virginia.

Many people categorize all mountaintop operations as "mountaintop removal." However, legally speaking, mountaintop removal is only one of three types of mountaintop operations addressed in this report (see glossary for definitions). The three types are: (1) mountaintop removal with a variance from approximate original contour (AOC), (2) mines which remove all of the coal seam or seams in the upper fraction of a mountain but which return the land to AOC, and (3) steep-slope mines with or without an AOC variance. Under SMCRA, as well as both Federal and State regulations, all mines are required to return the mined land to AOC, unless a variance is granted by the regulatory authority. In Virginia, that authority is the DMME/DMLR.

This report focuses on two kinds of issues:

- First, what standard does DMME/DMLR currently use in evaluating whether a particular postmining land configuration constitutes a return to AOC? This report describes various characteristics of land after mining in terms of elevation changes, creation of valley fills, creation of level sections, and other general descriptive information. The issue is how those characteristics, either individually or in combination, are used in determining if AOC has been achieved.

- Second, has DMME/DMLR required appropriate postmining land uses when it grants a waiver from AOC requirements?

## 2. CONCLUSIONS AND RECOMMENDATIONS

While mountaintop removal and steep slope mining in Virginia share some of the characteristics of mining practices in the neighboring states of West Virginia and Kentucky, the scale of such operations in Virginia is much smaller. Mountaintop removal sites account for less than one percent of the permits and three percent of the total permitted acreage in Virginia, while permits with variances for steep slope mining account for four and a half percent of the permits and four percent of the total permitted acreage (Charts A-1 and A-2, pages A-15 and A-16). Overall our study found that Virginia is successfully reclaiming mine sites and is limiting the amount of material disposed of in excess spoil fills.

The weaknesses that we found deal with the administration of various aspects of the Virginia program and not with the on-the-ground reclamation. In general, OSM agrees that reforms, as described below, which have been voluntarily initiated by DMME/DMLR to address the weaknesses are appropriate. OSM also believes that these reforms should be applied prospectively, and that existing mining operations, some of which were initially permitted many years ago, should be altered only to the extent practicable. DMME/DMLR has agreed to review all existing permits with variances and apply these reforms prospectively.

Based on an analysis of the information gathered during the oversight process, we developed the following conclusions, actions, and recommendations:

- An examination of all mining in Virginia shows that industry usually returns mine sites to AOC rather than obtaining an AOC variance (See Chart A-1, page A-15). Our study also shows that while Virginia has no written guidance for AOC, practical application of the principles has resulted in both variance and AOC sites being returned to a configuration more closely resembling AOC. The premining topography on most permits in our sample have some naturally occurring flat or gently rolling areas in addition to the steep slopes. Restoration to AOC or near AOC reestablishes the flat or rolling areas for implementing the postmining land use.
- Seventy percent of the permits in our sample proposed to place less material in fills than the predicted "swell" generated during mining (Table A-5, page A-23). Due to the high percentage of remaining sites in Virginia (80 percent of our sample), permittees' maintain most (83 percent) of the overburden generated during mining on the mine bench or on previously mined lands included within the permitted area. Because of the large amount of overburden retained on the mine benches and the overall configuration (including an average elevation change of -31' for AOC sites and -26' for variance sites, see Table A-4 on page A-21) of the resulting land, one must question whether the majority of the sites in our study required a variance from approximate original contour restoration in the first place.

- A database tracking system for mountaintop removal operations and associated waivers is not required by State or Federal law. Nonetheless, DMME/DMLR is changing to a new data base, that is currently being developed, to ensure that the new system contains the most accurate data possible. Both OSM and DMME/DMLR learned during this review that the practice of entering data at the time the application is received rather than when the permit is issued has caused discrepancies between the data and actual field conditions. DMME/DMLR has completed its inventory of all current surface mining permits and has clearly identified the sites that should be classified as "mountaintop removal" and/or "steep slope variance operations." A copy of the inventory is included in Appendix IV.
- The oversight evaluation found that one mountaintop removal permit and one steep slope permit have been issued with postmining land uses (forestry and fish and wildlife habitat) not authorized in the approved State program. To prevent this from recurring, DMLR revised its findings document to list the allowable land uses. During the next quarter, DMME/DMLR will examine all current permits with a mountaintop removal or steep slope variance to determine if similar situations exist and will take action to correct similar problems.
- Virginia regulations require numerous findings before a mountaintop removal or steep slope variance can be granted. Most of the mountaintop removal sites have agricultural postmining land uses. To satisfy the requirement of documenting the existence of a need and a market for the designated postmining land use, DMME/DMLR accepts letters in which the owners of the affected land request the postmining land use. DMLR is changing this practice and is currently developing guidance to ensure compliance with this section.
- Prior to issuing a steep slope variance, DMME/DMLR must find, among many things, that there will be watershed improvement. In our sample, this finding was not clearly identifiable. However, DMME/DMLR explained that if it approves a permit it has made a favorable finding. DMME/DMLR staff have already started developing procedures to better document the written findings. We found the other required items documented in each permit file.

## GLOSSARY OF MINING TERMS

OSM has defined the mining terms listed below in an effort to improve the general understanding of mining practices within the State of Virginia. These terms are used throughout this report. OSM has taken some of the definitions from the Virginia Coal Surface Mining Control and Reclamation Act (VCSMCRA), others from the Federal Surface Mining Control and Reclamation Act of 1977 (SMCRA), and others from State (VCSMRR) and/or Federal regulations. Furthermore, OSM has developed some definitions solely for the purpose of the report. When it is not otherwise clear, the source of each definition is identified in the brackets.

## **State program:**

*Approved State program.*—The Virginia surface coal-mining program approved under SMCRA that consists of the Virginia surface mining law, regulations, policies, and procedures that OSM approved initially on December 15, 1981. Subsequent amendments and actions concerning the approved State program are set forth in 30 C.F.R.

*Oversight.*—The term describes OSM's monitoring of a State's implementation of its approved program. [General term described in 30 C.F.R. Part 732.]

*Primacy.*—The term used to describe the delegation of primary authority by OSM to a State in administering its surface mining program. Virginia obtained primacy on December 15, 1981, with OSM's conditional approval of its permanent regulatory program. [General term described in 30 C.F.R. Part 732.]

## **Approximate original contour (AOC):**

*AOC.*—The surface configuration achieved by backfilling and grading of the mined area so that the reclaimed area, including any terracing or access roads, closely resembles the general surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain, with all highwalls and spoil piles eliminated. All mined areas are to be returned to AOC unless they receive a variance. [Term defined in section 4 VAC-25-130-700.5 of VCSMRR and subsection 701(2) of SMCRA.]

*AOC variance.*—A regulatory authority may grant a variance or waiver from the requirement to restore a site to AOC if certain specified conditions are satisfied. State and Federal law provide for the following types of AOC variances: mountaintop removal, steep-slope, thick overburden, thin overburden, and remined areas. This report concentrates only on mountaintop removal and steep-slope AOC variances.

A mountaintop removal variance can be granted by the regulatory authority only if the entire coal seam or seams running through the upper fraction of the hill, ridge, or mountain is removed, and a level plateau or a gently rolling contour is created with no highwalls remaining. The site granted such a variance must be capable of supporting certain postmining land uses.

A steep-slope AOC variance may be granted by the regulatory authority if (1) the proposed mining is going to occur in a steep-slope area, (2) the watershed control of the area will be improved by granting such a variance, and (3) the landowner requests in writing that the variance be granted in order that the land after reclamation will be suitable for an industrial, commercial, residential, or public postmining land use (including recreational facilities). [Section 4 VAC-25-130-785.16 of the VCSMRR and subsections 515(c) and (e) of SMCRA]

## **Types of mining applicable to this report:**

*Area mining.*— A mining operation where, unless the operation is located in a steep-slope area and a steep-slope AOC variance has been granted, all disturbed areas are restored to (1) AOC and (2) the site is capable of supporting the uses that existed prior to mining or an equal or better use.

An area-mining operation may remove multiple seams of coal in the upper reaches of a mountain just like a mountaintop removal operation; however, this type of operation cannot be classified as a mountaintop removal operation for two reasons. First, the site may be restored to AOC; second, the entire coal seam or seams may not be removed. [Section 4 VAC 25-130-700.5 of the VCSMRR and OSM/DMME/DMLR oversight work plan; definition modified for use in this report]

*Contour mining.*— Surface-mining technique that makes a cut into a hillside, creating a level bench with a highwall. A contour-mined area must be restored to AOC, including elimination of the highwall, unless the mining is conducted on a steep slope and a variance from AOC has been approved. In either situation, the highwall must be eliminated. The AOC variance would have to meet the requirements of a steep-slope variance.

*Mountaintop operations.*— Is a generic term used by the industry and public to describe the type of surface mining that removes all or a large portion of a coal seam or seams running through the upper fraction of a mountain or ridge. In common usage it includes: (1) mountaintop removal with a variance from AOC, (2) mines which remove all of the coal seam or seams in the upper fraction of a mountain but which return the land to AOC, and (3) steep-slope mines with or without an AOC variance.

*Mountaintop removal operation.*— Type of surface-mining operation that (1) has been granted a variance from AOC and (2) extracts an entire coal seam or seams running through the upper fraction of a mountain, ridge, or hill. Coal extraction must be accomplished by removing all of the overburden and creating a level plateau or a gently rolling contour that both has no highwalls remaining and is capable of supporting certain postmining land uses. The allowable postmining land uses for mountaintop removal operations are industrial, commercial, woodland, agricultural, residential, or public facility (including recreational facilities) use. [Section 4 VAC 25-130-785.14 of the VCSMRR and Subsection 515(c) of SMCRA]

*Steep-slope mining.*—Type of surface-mining operation where the natural slope of the land within the proposed permit area exceeds an average of 20 degrees. In

Virginia, those portions of a permit area classified as “steep slope” may obtain a variance from AOC if the permit application demonstrates that (1) the postmining use of the mined land will be equal to or better than its premining use, (2) the watershed affected by mining will be improved, and (3) mining will comply with all applicable provisions of the approved State program. Such operations could qualify as area, contour, or mountaintop mines, as further defined in this glossary. [Section 4 VAC 25-130-785.16 of the VCSMRR and 30 C.F.R. section 785.16]

**Mining-related terms:**

*Durable rock.*—Naturally formed aggregates that will not slake in water or degrade to soil material. State and Federal law provide that durable-rock fills must consist of at least 80 percent durable rock. [Sections 4 VAC 25-130-816.73 and 817.73 of the VCSMRR and 30 C.F.R. sections 816 and 817.73]

*Excess spoil.*—Overburden material that is disposed of in a location other than the mine pit and that is not needed to achieve AOC. [Section 4 VAC 25-130-700.5 of the VCSMRR and 30 C.F.R. section 701.5]

*Excess-spoil fills.*—Fill structures that are created by the placement of excess spoil in valleys, on hillsides, or on preexisting benches. The State program contains regulations for constructing valley or head-of-hollow, preexisting bench, and durable-rock fills. Although most excess-spoil fills are commonly referred to as valley fills, most mountaintop removal and steep-slope mining operations today involve the construction of durable-rock fills. [Sections 4 VAC 25-130-816.71 and 817.71 of the VCSMRR and 30 C.F.R. sections 816 and 817.71]

*Overburden.*—Consolidated or unconsolidated material of any type, excluding topsoil, which overlies a mineral deposit. [Section 4 VAC 25-130-700.5 of the VCSMRR]

*Premining/postmining land use.*—The primary uses of the land before and after mining. After mining, land is generally required to be returned to its premining use. As provided by section 4 VAC 25-130-816.133 and section 817.133 of the VCSMRR a site may be returned to an alternative postmining land use if certain requirements are satisfied. Permits involving mountaintop removal or steep-slope mining operations with variances from AOC may be issued by the regulatory authority only if they meet certain specified postmining land use requirements as described in the approved State program. [Section 4 VAC 25-130-700.5]

*Relief.*—Difference in elevation between the highest mountaintop, ridge, or hill and the lowest valley within a permit area. [Derived, for purposes of this report, from Bureau of Mines, *Dictionary of Mining, Mineral, and Related Terms*: U.S. Government Printing Office, 1968.]

*Required findings.*—Specific findings that a regulatory authority must make prior to granting a mountaintop removal permit or steep-slope AOC variance. [Section 4 VAC 25-130-785.14 (c) and subsections 515(c) and (e) of SMCRA]

*Steep slope.*—Any slope of more than 20 degrees or such lesser slope as may be designated by the regulatory authority after consideration of soil, climate, and other characteristics of a region or state. [Section 4 VAC 25-130-701.5 and 30 C.F.R. section 701.5]

*Swell.*—The tendency of soils, on being removed from their natural, compacted beds, to increase or swell owing to the creation of voids or spaces between soil particles. The volumetric increase, normally expressed as a percentage, that occurs as the consequence of changing undisturbed overburden (bank) into loose (excavated) material. [Derived, for purposes of this report, from Bureau of Mines, *Dictionary of Mining, Mineral, and Related Terms*: U.S. Government Printing Office, 1968.]