

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

LAND RECONSTRUCTION, CURRENTLY MINED LAND

(Acre)

CODE 544

DEFINITION

Restoring currently mined land to an acceptable form and planned use.

PURPOSE

- Prevent permanent damage to soil and water resources in and near mined areas.
- Restore the productivity of the soils to their pre-mining level.
- Reduce erosion and sedimentation.
- Maintain or improve the visual quality of the landscape.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on areas that are or will be undergoing surface mining operations.

This standard applies to the identification, removal, stockpiling and replacement of soil materials on currently mined land. It also applies to nearby areas that can be affected by the mining of various minerals or commodities.

CRITERIA

General Criteria Applicable to All Purposes

Reclamation and operation plans must comply with all local, State, and Federal laws and regulations relating to mining and reclamation.

These include but are not limited to:

- Surface Mining Control and Reclamation Act of 1977 (SMCRA), 30 U.S.C. 1201 et seq.
- 30 CFR 785.17, 816.22, and part 823.
- Federal Register/Vol. 64, No. 124, Tuesday, June 29, 1999/Notices, pages 34770-34778.

- Regulations of the Colorado Mined Land Reclamation Board for Coal Mining, as amended, August 30, 1980
- Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal and Designated Mining Operations, as amended, May 1977
- Colorado Mined Land Reclamation Act, as amended, July 1993
- Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials, as amended, October 1995
- Colorado In-Stream Aggregate Extraction and Reclamation Guidance Document, August 1998

Site preparation

Areas shall be cleared of trees, logs, brush, rubbish and other undesirable materials. Areas to be preserved including those containing trees, vegetation, stream corridors, natural springs or other important features shall be properly identified.

Additional Criteria to Restore the Productivity of Soils to Their Pre-mining Level.

Removal of material for soil reconstruction

A detailed soil survey shall be done on the entire area to be mined. This information will be used to determine the extent and location of prime farmland soils.

All upper soil horizons to be used in reconstructing the soil shall be removed from the immediate area before blasting, mining or any surface disturbance other than removal of woody plants.

If the area is prime farmland and/or soil productivity is consistent with that needed for post-mining use, the A horizon shall be removed and stockpiled separate. The B horizon or part of the C horizon or other underlying layers suitable for root development shall be removed and segregated for use as subsoil. The minimum depth of the soil and the soil material to be reconstructed shall be 48 inches (122 cm) or equal to the depth of the subsurface horizon in the natural soil, whichever is less. If root-inhibiting layers, such as bedrock or a fragipan, underlie the natural soil, the reconstructed depth shall be no less than the rooting depth of the original soil.

For soils that are not prime farmland, the A horizon shall be removed for use as surface soil on disturbed areas. If the A horizon is less than 6 inches (45 cm) thick, material (other than bedrock) immediately below the A horizon shall be removed and used to obtain this thickness. If the total thickness of the available material is less than 6 inches (15 cm), all unconsolidated material shall be used.

Soils identified with high electrical conductivity (EC), calcium carbonate, sodium or other restrictive properties shall be separated and treated if practical.

Removal of overburden material for use as topsoil

Selected overburden material can be substituted for or added to the material in the A and B horizons. Before this is done, field observations and/or chemical and physical laboratory analyses must be done which demonstrate that the overburden material, or a mixture of overburden and original topsoil, is better suited to restoring the capability and productivity than the original A and B horizon material. Analyses shall include determination of pH value; sulfide content; percentage of organic material; nitrogen, phosphorus, and potassium contents; sodium absorption ratio (SAR); electrical conductivity (EC); texture; and available water capacity. Field-site trials or greenhouse tests shall be conducted if needed to ascertain the feasibility of using overburden material.

If the overburden material is determined to be suitable, it must be removed, segregated and replaced according to the requirements specified in this standard.

Storage of soil material

If it is impractical to spread the material immediately after the land is regraded, it must be stockpiled. Stockpiles shall be selectively located and protected against wind and water erosion, unnecessary compaction, and contamination by undesirable materials

Replacement of soil material

Before spreading topsoil, the regraded areas must be scarified or otherwise treated to eliminate slippage surfaces and to promote root penetration.

Topsoil shall be spread in a manner that:

1. Insures that the position and thickness of each horizon is equivalent to those in the undisturbed soil.
2. Prevents excess compaction. The bulk density and soil strength of the reconstructed soil when moist must permit the soil to support plant growth at a level equivalent to that of a similar layer in undisturbed soil.

Nutrients and soil amendments

After the topsoil has been spread on the disturbed areas, nutrients and soil amendments shall be applied based on a nutrient management plan for the site.

Additional Criteria to Reduce Erosion and Sedimentation

For all post-mining land uses, develop a resource management system that reduces water and/or wind erosion to acceptable levels.

The resource management system shall consider buffer practices, such as filter strips, riparian forest buffers, contour buffer strips or similar practices that will reduce sediment delivery off the reclamation site.

Additional Criteria to Maintain or Improve the Visual Quality of the Landscape

The appearance of the reclaimed site shall be in accordance with standards for maintaining and improving the visual quality of the landscape and shall be compatible with the adjacent landscape. Areas of high public visibility or those offering direct or indirect human benefits shall be evaluated and considered in landscape resource management planning and design.

CONSIDERATIONS

Evaluate water and other related resources.

Consider locations for storage of soil material, access roads, and possible permanent impoundments.

Consider measures for placement of spoil, water disposal, replacement of soil material, restoration of soil productivity and revegetation of disturbed areas.

Consider measures to maintain or enhance landscape resources.

A special concern is the potential for uncovering or redistributing toxic materials from earth moving activities.

Consider cultural resources when planning, installation, and maintenance. This practice may adversely affect cultural resources and should comply with 420 GM Part 401 concerning cultural resources.

PLANS AND SPECIFICATIONS

Plans and specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations and Operation and Maintenance requirements of this standard. Specifications shall describe the requirements for applying this practice to achieve the intended purpose.

Specifications shall be recorded on approved specification sheets, job sheets, narrative statements in the conservation plan or other acceptable documentation.

OPERATION AND MAINTENANCE

A plan shall be prepared that provides specific details concerning maintenance and operation of conservation practices identified in the reclamation plan. The maintenance and operation plan shall specify procedures for:

- filling areas where settlement may adversely affect drainage and land use
- promptly repairing and revegetating bare spots and eroded areas
- adding soil amendments to soils that cannot support adequate vegetation or replacing them with suitable soil material
- maintaining access roads
- keeping drainage structures and channels clean and functional
- applying fertilizer and lime
- controlling weeds
- using proper grazing practices
- controlling vehicular traffic

REFERENCES

Colorado Field Office Technical Guide, Section IV. Critical Area Planting Practice Standard, Code 342. 2003. USDA, Natural Resources Conservation Service. Lakewood, CO.

Colorado Field Office Technical Guide, Section I. Plant Materials Technical Note No. 59. 2002. Plant Suitability and Seeding Rates for Conservation Plantings in Colorado. USDA, Natural Resources Conservation Service. Lakewood, CO.