

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 negative impacts to soil, water and air resources in and near mined areas.
- Restore the quality 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 standard applies to areas that are or will be undergoing surface mining operations. It applies to the identification, removal, stockpiling and replacement of soil materials on currently mined land. This standard also applies to nearby areas that may be affected by the mining activities.

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.

At the federal level, these include:

- 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.
- 30CFR780.15 - Air pollution control plan.
- 30CFR701.5 - Definitions: Fugitive dust.

Information on the existing state of Florida regulations regarding mining and reclamation can be found at Florida Dep. of Environment Protection website

(<http://www.dep.state.fl.us/water/mines/rules.htm>).

Impact to cultural resources, wetlands, and Federal and State protected species needs to be avoided or minimized to the extent practical during planning, design and implementation of this conservation practice in accordance with established National and Florida NRCS policy, General Manual (GM) Title 420-Part 401, Title 450-Part 401, and Title 190-Parts 410.22 and 410.26; National Planning Procedures Handbook (NPPH) FL Supplements to Parts 600.1 and 600.6; National Cultural Resources Procedures Handbook (NCRPH); and The National Environmental Compliance Handbook (NECH).

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [electronic Field Office Technical Guide](#).

Additional Criteria to Prevent Negative Impacts to Soil, Water, and Air Resources in and near Mined Areas

Dust Control. To minimize the generation of particulate matter and fugitive dust during removal and replacement of soil and other earthy materials, vehicular and pedestrian traffic needs to be controlled. When appropriate, soil moisture can be increased. Additionally, temporary vegetation can be used, as needed, on disturbed soils.

When wind direction and velocity could allow particulate matter and dust to impair visibility on roads downwind from the construction area, earth moving activities need to be restricted or stopped.

Site preparation. Clear trees, logs, brush, rubbish, and other undesirable materials from the area. Properly identify areas to be preserved, including those containing trees, vegetation, stream corridors, natural springs or other important features.

Install additional structural measures as needed to support the intended use of the site.

See Florida NRCS Conservation Practice Standard Clearing and Snagging, Code 326; Contour Buffer Strips, Code 332; Land Clearing, Code 460; Land Smoothing, Code 466; Riparian Forest Buffer, Code 391; Spoil Spreading, Code 572; or Streambank & Shoreline Protection, Code 580, and their accompanying guidance for more information.

Establishment of Vegetation. Use only plant materials adapted to the site conditions, and appropriate for the intended use of the site.

Apply soil amendments and plant nutrients to the site based on soil test recommendations to achieve the physical and chemical soil conditions suitable to support plant growth. See Florida Conservation Practice Standard for Nutrient Management, Code 590, for further guidance.

Seedbed preparation, seeding rates, dates of planting, and planting methods need to be consistent with the intended use of the site and approved local criteria.

For information regarding site preparation, species selection, seeding rates, and post planting management see:

- Florida NRCS Conservation Practice Standards Critical Area Planting, Code 342; Forest Site Preparation, Code 490; Filter Strip, Code 393; Field Border, Code 386; Pasture and Hay Planting, Code 512; Range Seeding, Code 550; Tree/Shrub Establishment, Code 612;
- their accompanying guidance information; and
- Florida NRCS Plant List for Conservation Alternatives, Florida NRCS Field Office Technical Guide Section II (G) (1).

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

Removal of Material for Soil

Reconstruction. A detailed soil survey needs to be completed for the entire area to be mined. This information will be used to determine the extent and location of prime farmland soils.

Remove from the immediate area all upper soil horizons to be used in reconstructing the soil 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, remove and stockpile the A horizon separately from other soil material. Remove and segregate the B horizon or part of the C horizon or other underlying layers suitable for root development for use as subsoil. Reconstructed soil needs to be a minimum of 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 needs to be equal to or greater than the rooting depth of the original soil.

For soils that are not prime farmland, remove the A horizon 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 can

be removed and used to obtain this thickness. If the total thickness of the available material is less than 6 inches (15 cm), use all unconsolidated material.

If soils are identified with high electrical conductivity (EC), calcium carbonate, sodium or other restrictive properties, they need to 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. Minimally 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 analysis needs to be run. If necessary to ascertain the feasibility of using overburden material, field-site trials or greenhouses tests need to be conducted.

If the overburden material is determined to be suitable, the overburden needs to be removed, separated from other material 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. Locate stockpiles where they are protected against wind and water erosion, particulate matter generation (e.g., PM-10 air pollution), 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 slick surfaces and to promote root penetration.

Spread topsoil 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.

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 for the planned use of the site.

The resource management system needs to 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 needs to be compatible with the adjacent landscape.

Special consideration needs to be given to areas highly visible to the public or those offering direct or indirect human benefits during the landscape resource management planning and design phase.

CONSIDERATIONS

Consider 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 and replacement of soil material, restoration of soil productivity, and revegetation of disturbed areas.

Consider measures to maintain or enhance landscape resources.

Reclamation has great potential for increasing or improving wildlife habitat in the reclaimed area. If possible, avoid monocultures when developing vegetative specifications.

Planting reclaimed areas to perennial vegetation to sequester carbon and improve air quality.

The use of organic materials such as manure, compost, mulch or sewage sludge can

contribute to the success of vegetative establishment and the long-term success of the planting. Such materials also can increase the organic matter content of the soil.

PLANS AND SPECIFICATIONS

Plans and specifications for reconstructing currently mined land need to be in keeping with this standard and need to describe the requirements for applying the practice to achieve its intended purpose.

Plans need to include provisions for the disposal of toxic materials that may be uncovered as a result of earth moving and reclamation activities.

A reclamation plan must be developed for each site. The plan must specify the required procedures for conducting reclamation operations.

Specifications for reconstruction currently mined lands need to include:

- Map showing location of mining operation.
- Type of site preparation including removal, storage, and replacement of overburden or soil.
- Type of dust abatement procedures/ devices to be used
- Type of vegetation with accompanying seeding/sprigging rates, site preparation, planting dates, care, and handling to be used during mining operation and in the reclamation plan.

OPERATION AND MAINTENANCE

An O&M plan needs to provide specific details concerning maintenance and operation of conservation practices identified in the reclamation plan. The O&M plan shall specify procedures for:

- Filling areas where settlement may adversely affect drainage and the intended land use.

- On sites established to perennial vegetation, promptly repairing and revegetating bare spots, eroded areas, areas of excessive settlement, and other areas on which the initial attempt to establish vegetation was not successful.
- 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 if applicable.
- Controlling vehicular traffic.

REFERENCES

Soil Survey Division Staff. 1993. Soil survey manual. Pp. 90-92. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Science of American Proceedings. 1956. Volume 20, Number 20, Pp. 288-292, "Influence of Moisture on Erodibility of Soil by Wind".

Wullschlegel, S.D., S.A. Segrest, D.L. Rockwood, and C.T. Garten, Jr. 2004. Enhancing soil carbon sequestration on phosphate mine lands in Florida planting short-rotation bioenergy crops. Third Annual Conf. Carbon Sequest., Alexandria, Va. 3-6 May 2004. Washington, DC. 7 pp.