

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

LAND RECONSTRUCTION, ABANDONED MINED LAND

(Acre)

CODE 543



Photo by Michael McLoone (www.sun-herald.com)

DEFINITION

Restoration of land and water areas that are adversely affected by past mining practices, thereby increasing the productivity of the areas for a beneficial use.

PURPOSE

- Stabilize mined areas so that they can be used to support desirable vegetation.
- Reduce erosion and sedimentation.
- Enhance water quality or quantity.
- Maintain or improve the visual quality of the landscape.
- Protect public health, safety and general welfare.
- To reduce airborne particulate matter.
- Improve soil quality and sequester carbon.

CONDITIONS WHERE PRACTICE APPLIES

On abandoned mined land where environmental quality has been degraded, beneficial use of land or water and air

resources have been prevented or interfered with, or the health or safety of individuals have been endangered.

The standard applies to the construction, grading, and reshaping of land that has been disturbed or adversely affected by past mining of all minerals and commodities.

CRITERIA

General Criteria Applicable to All Purposes

Reconstruction plans must comply with all local, state and federal laws and regulations relating to mining and reclamation. Current Florida Dep. Environmental Protection rules concerning mineland reclamation can be found at: <http://www.dep.state.fl.us/water/mines/>.

Land reconstruction on abandoned mined lands need to include all the components necessary to reclaim and stabilize the area and to prevent further degradation of air, water, soil and plant resources. The system will usually consist of one or more components such as Florida NRCS Conservation Practice Standard Clearing and Snagging, Code 326; Critical Area Treatment, Code 342; Grade Stabilization Structures, Code 410; Land Clearing, Code 460; Land Smoothing, Code 466; Spoil Spreading, Code 572; Streambank & Shoreline Protection, Code 580; or Terraces, Code 600.

Impact to cultural resources, wetlands, and Federal and State protected species need 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

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](#).

Handbook (NPPH) FL Supplements to Parts 600.1 and 600.6; National Cultural Resources Procedures Handbook (NCRPH); and The National Environmental Compliance Handbook (NECH).

Additional Criteria to Stabilize Mined Areas So That They Can Be Used to Support Desirable Vegetation

Site Preparation. Clear areas of trees, logs, brush, rubbish, and other undesirable materials that prevent application of the practice prior to grading. Dispose of these materials so that they do not interfere with water disposal practices, stabilization operations, or the operations associated with the planned use of the land.

Unsuitable soil material must be removed and buried so that it does not adversely affect water quality or plant growth. These materials must be disposed of in a manner that minimizes the potential for seepage, which can pollute surface and groundwater. Materials containing heavy metals must be buried to a depth below the root zone, or suitable kinds and amounts of soil amendments must be added.

Control generation of dust, as needed, during earthmoving activities.

When overhanging rocks and walls need to be covered, the slope needs to be shaped to a ½ horizontal to 1 vertical slope before the soil is placed against the wall, unless a flatter slope is needed for stability. Unless otherwise specified, spread fill material in successive layers not more than 2 feet (0.6 m) thick.

Removal and Placement of Material for Final Cover. Any soil material on the site that is suitable for the intended final use needs to be salvaged, stockpiled and protected for use as final cover material.

At least 80 percent of the area must be covered with reconstructed soil that meets the requirements for the intended land use. The rest of the area must be brought to a condition that it can be stabilized.

Spread the salvaged material and other suitable materials over the graded areas to the depth specified in the reclamation plan.

Establishment of Vegetation. Plant materials selected for the site need to be adapted to the site conditions. 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; and 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).

Soil amendments and plant nutrients need to be applied to achieve the physical or chemical soil conditions suitable to support plant growth prior to planting. See Florida Conservation Practice Standard Nutrient Management, Code 590, for further guidance.

Install additional structural measures needed, such as terraces, lined waterways and/or grade stabilization structures.

Restoration of Borrow Area. If cover material is taken from outside the reclamation site, the borrow area must be graded and reshaped to insure proper drainage and be revegetated to control erosion.

If the cover material is taken from adjacent land, the topsoil from the borrow area must be stockpiled separately and replaced after the borrow area is restored for its intended purpose.

If the borrow area is prime farmland, the A and B horizons (or the B and C horizons if applicable) must be removed and stockpiled separately by horizon and then replaced on the borrow area in natural sequence. The combined thickness of the replaced horizons needs to be adequate to restore the original soil productivity. Treatment of the borrow area needs to meet the requirements of Florida NRCS Conservation Practice Standard Land

Reconstruction, Currently Mined Land, Code 544.

Additional Criteria to Reduce Erosion and Sedimentation

The final slope must permit application of needed conservation and management practices to keep soil losses within planned permissible levels. Allowances must be made for expected settlement during final grading if settlement is likely to interfere with the planned use of the land, surface drainage, or water disposal.

Use temporary seeding, mulching, water disposal, and similar measures, as necessary, to help control erosion.

Additional Criteria to Enhance Water Quality or Quantity

Water Disposal. Determine if there will be a need for a water disposal system, and if it is needed, include a design for such a system in the final plan design. The water disposal system must be adequate to control erosion during and after stabilization. Promptly stabilize all disturbed areas if any practices are removed after perennial vegetation is established. Water disposal systems suitable for intensively farmed cropland are usually required for mined land reclamation and may be used as a guide in the absence of local experience.

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

The appearance of the reclaimed site must be compatible with the adjacent landscape. Areas highly visible to the public or those offering direct or indirect human benefits need to be given extra consideration during landscape resource management planning and design phase. Soil piles and borrow areas need to be shaped to blend with the adjacent landscape as much as possible.

Additional Criteria to Protect Public Health, Safety and General Welfare

Provisions must be made to reduce potential safety hazards and erosion and water pollution problems in areas that have highwalls and landslides.

Additional Criteria to Reduce Airborne Particulate Matter

Dust Control. The generation of particulate matter and fugitive dust needs to be controlled when moving soil and other earthy materials by controlling vehicular and pedestrian traffic; and when appropriate, by modifying soil moisture content. Establish temporary vegetation on disturbed soils as needed.

Restrict or stop earth moving activities when wind direction and velocity could allow particulate matter and dust to impair the visibility on roads downwind from the construction area.

Additional Criteria to Improve Soil Quality and Sequester Carbon

Establish perennial plant species that are consistent with planned use and will produce the greatest quantity of above and below ground biomass on the site.

CONSIDERATIONS

Developing a detailed soil survey of the area to be reclaimed and the proposed borrow area to identify the types and extent of soil materials.

Consider the need for access roads that would facilitate final reclamation activities and operation and maintenance.

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

Limit or stop earth-moving activities when wind direction and velocity could allow particulate matter to impair visibility on roads downwind from the construction area.

Planting reclaimed areas to perennial vegetation that will enhance carbon sequestration 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. It also can increase the organic matter content of the soil.

PLANS AND SPECIFICATIONS

Plans and specifications for reconstructing abandoned mined land need to be in keeping with this standard and need to describe the requirements for applying the practice.

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

A reclamation plan must be developed for each site. The plan needs to specify the required procedures for conducting reclamation and reconstruction activities.

Specifications need to minimally include:

- Map showing location of reclamation project.
- Type of site preparation including location of access roads; water control and disposal structures; removal, storage, and replacement of overburden or soil; and source and placement of additional fill material.
- 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 in during mining operation and in the reclamation plan.

OPERATION AND MAINTENANCE

Prepare an O&M plan that provides specific details concerning maintenance and operation of conservation practices identified in the reclamation plan. The maintenance and operation plan needs to specify procedures for:

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

- 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".

Wullschleger, 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.