

SECTION II

II - D. SOIL INTERPRETATIONS

8. Mined Land

INTRODUCTION

Various interpretations can exist here including the potential of the soil as a source of certain construction materials, the potential for certain minerals to occur, and the revegetation issues associated with reclamation of mined land. Interpretations for mined land reclamation, revegetation, and maintenance are locally developed. Guidance for interpretation development is available in section 617 – Soil Interpretations of the USDA-NRCS National Soil Survey Handbook (NSSH).

MINED LAND INTERPRETATIONS

Soil as a Source of Construction Materials

Within the Soil Data Mart, interpretations for Construction Source materials are found in the “Source of Reclamation Material, Roadfill, and Topsoil (CA)” and “Source of Sand and Gravel (CA)” reports.

Within the Web Soil Survey, maps and tables for Construction Source materials are found under the “Suitabilities and Limitations for Use” tab, under the section “Construction Materials”.

Roadfill Source (CA)

Roadfill consists of soil material that is excavated from its original position and used in road embankments elsewhere. The evaluations for roadfill are for low embankments that are less than 6 feet in height and are less exacting in design than high embankments such as those along superhighways. The rating is given for the whole soil, from the surface to a depth of about 5 feet, based on the assumption that soil horizons will be mixed in loading, dumping, and spreading. Soils are rated as to the amount of material available for excavation, the ease of excavation, and how well the material performs after it is in place.

Topsoil Source (CA)

The term “topsoil” has several meanings. As used here, the term describes soil material used to cover an area so as to improve soil conditions for the establishment and maintenance of adapted vegetation. Generally, the upper part of the soil, which is richest in organic matter, is most desirable; however, material excavated from deeper layers is also used. In this rating, the upper 40 inches of soil material is evaluated for use as topsoil. In the borrow area, the material below 40 inches is evaluated for its suitability for plant growth after the upper 40 inches is removed. The soil properties that are used to rate the soil as topsoil are those that affect plant growth, the

ease of excavation, loading and spreading, and those that affect the reclamation of the borrow area.

Sand Source (CA)

Sand as a construction material is usually defined as particles ranging in size from 0.074 mm (sieve #200) to 4.75 mm (sieve #4) in diameter. Sand is used in great quantities in many kinds of construction. Specifications for each purpose vary widely. The intent of this rating is to show only the probability of finding material in suitable quantity. The suitability of the sand for specific purposes is not evaluated. If the lowest layer of the soil contains sand, the soil is rated as a Good source regardless of thickness. The assumption is that the sand layer below the depth of observation exceeds the minimum thickness.

Gravel Source (CA)

Gravel as a construction material is defined as particles ranging in size from 4.76 mm (sieve #4) to 76 mm (3 inches) in diameter. Gravel is used in great quantities in many kinds of construction. Specifications for each purpose vary widely. The intent of this rating is to show only the probability of finding material in suitable quantity. The suitability of the gravel for specific purposes is not evaluated. If the lowest layer of the soil contains gravel, the soil is rated as a Good source regardless of thickness. The assumption is that the gravel layer below the depth of observation exceeds the minimum thickness.

Reclamation Source (CA)

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material, or unconsolidated geological material or both are placed in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the report do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Potential for Minerals to Occur

Information on the potential for certain minerals to occur can be found with the California Department of Conservation, California Geological Survey. Their website address is <http://www.conservation.ca.gov/cgs/Pages/Index.aspx> . The California Geological Survey develops and interprets information concerning California's geology, mineral resources, and seismology through reports and maps.

Management of Disturbed Land (Mined Land Reclamation)

Soil properties should be considered in managing and reclaiming mined lands. Potential considerations include soil organic matter content, soil pH (will be typically acidic), bulk density, compaction, available water capacity, and erosion hazard.

The organic matter content is considerably lower in formerly mined soils than in natural soils. A high bulk density is common in both the replaced soil material and the underlying graded spoil. The compaction is a result of the use of heavy machinery, especially wheeled reclamation equipment; excessive handling of topsoil materials when it is stockpiled and spread; mining and reclamation activities performed under unfavorable moisture conditions; and insufficient time for soil-forming processes to decrease the bulk density. The high bulk density reduces the available water capacity and retards plant growth. As a result, it is more difficult to establish vegetative cover.

Although highly variable, the content of rock fragments in mine spoil is generally high than the surface layer of most soils. Rock fragments reduce the available water capacity and few roots penetrate the compact, massive spoil material.

Planting suitable grass and legume species improves soil structure, reduces bulk density, and increases the organic matter content, the water infiltration rate, pore space, and root growth in formerly mined soils. The established grasses and legumes provide soil protecting cover and reduce the susceptibility to runoff and erosion. The NRCS Vegetative Guide (Technical Guide, Section II) provides vegetative recommendations for planting in these areas (critical area planting conservation practice).

Thin stands should be reseeded. Conservation tillage methods of seedbed preparation that keep plant residue on the surface, including no-till planting, reduce the hazard of erosion. Companion crops also reduce this hazard.

Formerly mined lands are generally unsuited for grazing in winter, when they are wet. Winter grazing can result in compaction and damage to the plants and can increase the erosion hazard. These soils are better suited to frequent, light applications of fertilizer than to larger applications because of the loss of plant nutrients through runoff and the concentration of roots in the upper few inches of the soil.

Other considerations when reclaiming or otherwise managing mined lands include filtering out heavy metals (will affect vegetation establishment); presence of asbestos, mercury and other toxic minerals; water quality issues; and structural stability associated with abandoned shafts and tunnels.

Information on reclaiming mined lands can be found in the California Department of Conservation, Office of Mine Reclamation (OMR). Their website address is <http://www.conservation.ca.gov/omr/Pages/Index.aspx>.