United States Department of Agriculture

NRCS

Natural Resources Conservation Service

In cooperation with University of Georgia, College of Agricultural and Environmental Sciences, Agricultural Experiment Stations

Soil Survey of Butts County, Georgia

How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

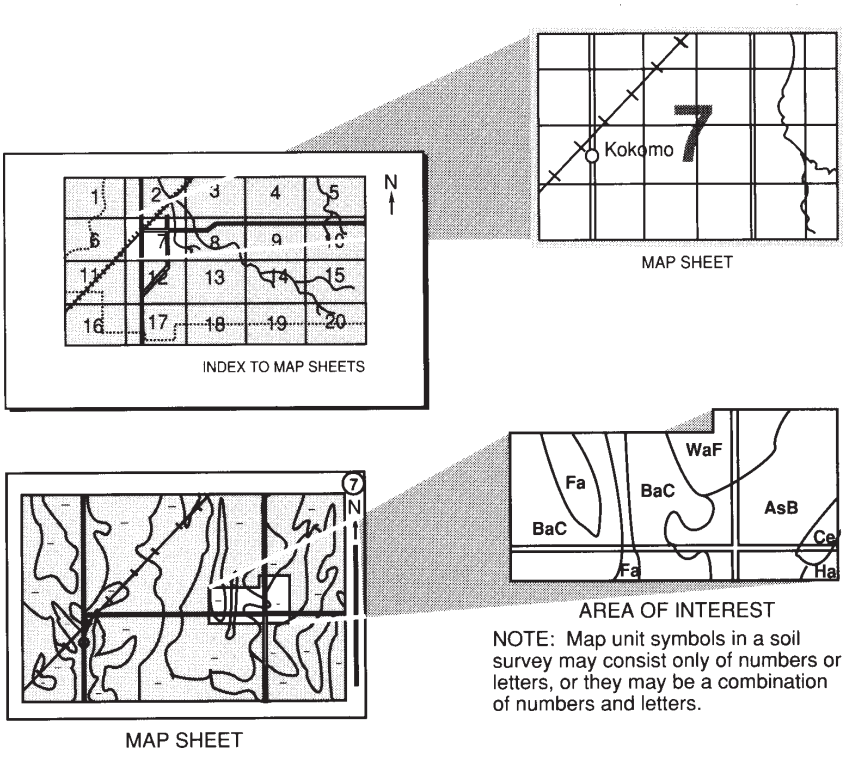
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the Natural Resources Conservation Service and the University of Georgia, College of Agricultural and Environmental Sciences, Agricultural Experiment Stations. The survey is part of the technical assistance furnished to the Towaliga Soil and Water Conservation District.

Major fieldwork for this soil survey was completed in 2000. Soil names and descriptions were approved in 2003. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2003. The most current official data are available on the Internet.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Nondiscrimination Statement

Cover Caption

Chief McIntosh Lake in an area of Madison-Bethlehem complex, 15 to 30 percent slopes, stony. Autumn colors grace Chief McIntosh Lake at Indian Springs State Park. The park is considered to be one of the oldest state parks in the United States.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

Contents

Issued 2006

Foreword

Soil surveys contain information that affects land use planning in survey areas. They include predictions of soil behavior for selected land uses. The surveys highlight soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

Soil surveys are designed for many different users. Farmers, ranchers, foresters, and agronomists can use the surveys to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the surveys to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the surveys to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

James E. Tillman, Sr.
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Butts County, Georgia

By James R. Lathem, Natural Resources Conservation Service

Fieldwork by James R. Lathem, Sherry E. Carlson, and Casey Sowell, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
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Butts County is in the north-central part of Georgia (fig. 1). It has a total area of 121,400 acres, or about 190 square miles. Jackson is the county seat.

Butts County is in the Southern Piedmont Major Land Resource Area (MLRA). Nearly level soils on flood plains are well drained to very poorly drained and generally are loamy throughout. Most of the soils on uplands are well drained and have a loamy surface layer and a clayey subsoil in shades of red or dark red. The soils on the broad, gently sloping ridges and sloping hillsides generally have a thicker subsoil than the soils on the strongly sloping to steep hillsides and side slopes.

The lowest elevation in the survey area, about 380 feet, is located at the Ocmulgee River at Georgia Highway 83. The highest elevation, about 800 feet, is located in the western part of the county near the Henry County line.

This soil survey updates the survey of Butts and Henry Counties published in 1919 (Long and others, 1919). It is a subset of the Southern Piedmont MLRA update. This soil survey provides more detailed information on map unit composition, improved interpretations, and a digital soil map with up-to-date digital orthophotography.

General Nature of the Survey Area

This section provides general information about Butts County, Georgia. It describes the history and settlement, agriculture, geology, water resources, and climate.

History and Settlement

Sherry Carlson, soil scientist, Natural Resources Conservation Service, prepared this section.

The Creek Indians originally inhabited the area that is now Butts County. The area was first discovered by settlers in 1792 and became popular for the supposed healing powers of the sulfur springs located between the Towaliga and Ocmulgee rivers. A treaty signed on January 8, 1821, acquired lands from the Creek Indians, which created Dooly, Fayette, Henry, Houston, and Monroe counties. Around 1822, the lands were opened for settlement through a lottery system. Settlers came from other parts of the state as well as from the Carolinas and Virginia. The signing of a treaty on February 12, 1825, ceded almost all of the remaining Creek lands to Georgia. On December 24, 1825, Butts County was formed from parts of Henry and Monroe counties by the General Assembly. Since its formation, the boundaries of Butts County

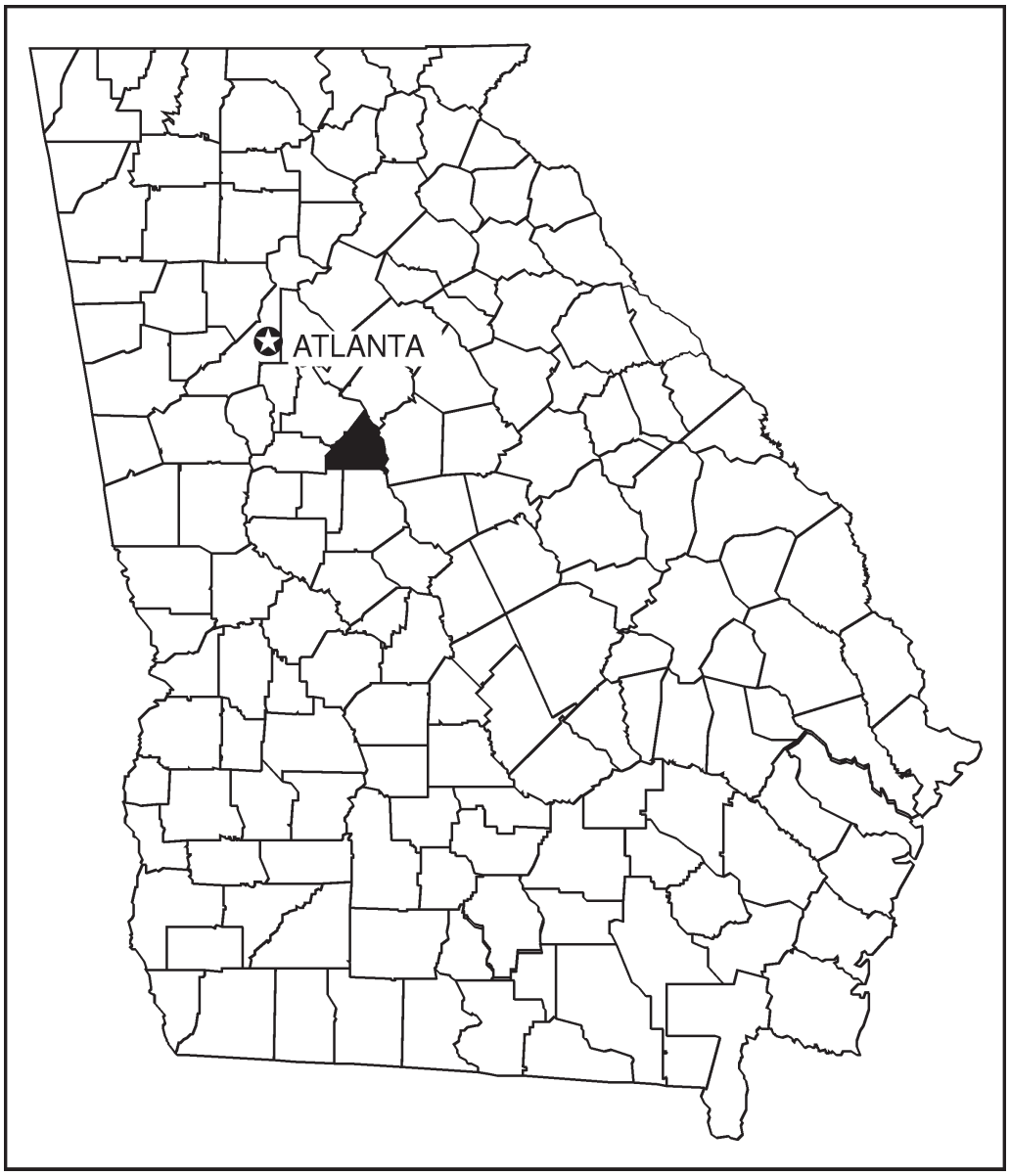

Figure 1.—Location of Butts County in Georgia.

have changed several times; lands have been taken from and given to Henry and Spalding counties over the years (Cooksey, 2005; McMichael, 1978).

Butts County was named for Captain Samuel Butts, an officer of the state militia in the War of 1812. The county seat was given the name Jackson, named for President Andrew Jackson, and was incorporated as a town on December 26, 1826 (Cooksey, 2005; McMichael, 1978).

Rural development and population growth were rapid during the early years of settlement in Butts County because of favorable farming conditions. According to the U.S. Census Bureau, the population of Butts County in 1830 was 4,912. At the turn of the twentieth century, the population of the county was 12,805. The population declined sharply from 12,327 in 1920 to 9,345 in 1930. This decrease in population was due largely to the decline in agriculture. In 1990, the population was 15,326 (Boatright and Bachtel, 1999).

The Ocmulgee River is the most prominent river in Butts County and was the primary basis for early industrial growth in the county. Many cotton and grist mills were established along the river and its tributaries. The river and the agricultural development that surrounded it also contributed to the construction of roads throughout the county.

In November of 1864, Butts County fell subject to the wrath of General William T. Sherman on his march through the South. Many homes and industries were destroyed. In the aftermath of the war, however, the county rebuilt and industry soon rebounded (McMichael, 1978).

One of the greatest development projects on the Ocmulgee River was the construction and development of the hydroelectric power plant, located about eight miles east of Jackson. Construction of the Ocmulgee Dam began in 1908 for the Central Georgia Power Company. At that time, it was the tallest dam that had ever been planned in Georgia. It had the capacity to raise water 100 feet above its original surface. After completion of the dam in 1910, the water stretched back for nearly 17 miles and formed Jackson Lake, the largest lake in Georgia until after World War II. The plant supplied electricity to cities throughout middle Georgia. The plant was bought by the Georgia Power Company in 1929 (McMichael, 1978).

Agriculture

Sherry Carlson, soil scientist, Natural Resources Conservation Service, prepared this section.

Prior to settlement, the survey area was covered by virgin forests of oak, hickory, dogwood, pine, and chestnut. The river bottoms were forested predominately by gum, oak, poplar, ash, willow, and alder (Long and others, 1919).

Early settlers began clearing the forests to establish homes and farms soon after the treaties of 1821 and 1825 were signed. The earliest form of agriculture was subsistence farming. Animals were raised and crops were grown to produce food and fiber to feed and clothe the farm family and to use as commodities of exchange.

The first cultivated crops grown in the survey area were corn, wheat, oats, and barley. Cotton was not a major crop initially, but acreage significantly increased as transportation and markets developed.

There were no commercial fertilizers in the early period of development, and it was a common practice to abandon old fields as their productivity declined. Abandoned fields suffered serious damage through accelerated soil erosion, and valuable timber was lost as new lands were cleared for production (Long and others, 1919).

After the Civil War, cotton quickly became the chief source of income as farmers turned from subsistence farming to commercial farming. During this period, nearly all the land that had been devoted to grain crops and most of the newly cleared land was put into cotton production. Animal products and small grains, which until then had been produced in sufficient quantities to meet local needs, now had to be purchased from outside the county. Many farmers began to utilize commercial fertilizers to maximize cotton production. From 1899 to 1919, Butts County farmers planted an average of 34,000 acres in cotton annually. During this period, only a few progressive farmers practiced crop rotation. This practice was not considered practical because the typical farming system at that time was a one-crop and tenant system. Because of this, some fields were continuously planted in cotton for more than 40 years (Long and others, 1919).

Agriculture and business revolved around cotton production up until the invasion of the boll weevil in the 1920's. The boll weevil ruined cotton production, which devastated the cotton industry and forced many farmers to leave their farms and seek work elsewhere. The effects of continuous cotton farming and the desertion of farms in the 1920's left the exposed land vulnerable to erosion (Satterthwaite, 1990).

It was not long before people became increasingly aware that the land needed to be protected. In 1937, legislation by the state of Georgia established soil conservation districts. This enactment was supported by some of the leading farmers in Butts County. In May of 1941, Butts County became part of the Towaliga Soil and Water Conservation District. Farmers began using crop rotations, terraces, and grassed waterways and improved pastures and ponds to control erosion and increase land productivity. Many seriously eroded fields that had been cultivated in the past were planted to grasses or trees.

Although the production of row crops has greatly declined since the early part of the twentieth century, agriculture is still an important part of the county's economy. In 1997, there were 148 farms in Butts County that were an average of 186 acres in size (Boatright and Bachtel, 1999). In 1999, the major source of income from agriculture in the county was from beef cattle (Georgia Department of Agriculture, 1999). Corn, soybeans, rye, wheat, sunflowers, and lespedeza are grown on minimal acreages. Vegetable crops and pecans also are of some agricultural importance in Butts County.

Geology

William R. Fulmer, geologist, Natural Resources Conservation Service, helped prepare this section.

Butts County is in the Washington Slope District of the Piedmont Physiographic Province and the Southern Piedmont Major Land Resource Area. The Washington Slope District is characterized by a gently undulating surface that gradually changes in elevation. Broad ridges and long, smooth slopes are common.

The county has experienced long periods of deformation, igneous intrusion, and metamorphism, which formed igneous and metamorphic rocks. In most areas, unweathered rocks are overlain by a layer of weathered material composed of saprolite that has been overlain by soil horizons. Saprolite is formed by the in-place weathering of rock and retains much of the features and the structure of the rock.

In general, Butts County is underlain by interlayered schists, amphibolites, and gneisses, referred to as the Zebulon Formation. The schists and interlayered hornblende amphibolites contain garnet and sillimanite. The schists weather to a distinct pink or purple color and the hornblende weathers to an ocher color. Soils and saprolite derived from the weathering of gneisses generally will have a yellowish red or red color.

Granite gneiss is a significant parent material in the county. This rock is an extension of a northeastern trending intrusion that crosses the north end of Jackson Lake and extends southwest, nearly to the town of Jackson. This granite gneiss generally is grayish-white biotite granite gneiss that has scattered grains of garnet and magnetite. Weathering produces a pale brown to nearly red saprolite soil material.

The Towaliga Fault Zone crosses the southeastern corner of the county. This fault has been traced from eastern Alabama to Jasper County, Georgia. There are not any good exposures of the fault; it is mapped based on the occurrence of mylonites and other related crushed rock. Mylonites tend to be chert-like rocks that have a streaky or banded structure and are produced by the shearing of rocks. Clastic rocks, which consist of fine-grained, broken rock fragments that are referred to as microbreccia, also provide evidence of the fault zone. These rocks are limited, however, and may be difficult to trace in the field.

Much of Butts County south of the Towaliga Fault Zone is underlain by interlayered schist and gneiss. Biotite-quartz-feldspar gneiss is a common rock that has garnet interlayered with biotite schist. Pegmatite dikes that consist of coarse-grained quartz, feldspar, muscovite, and biotite occur throughout this area. The weathering of these rock materials produces a brown to red soil residuum.

Water Resources

The most abundant supplies of surface water in Butts County are provided by the Ocmulgee River, the South River, the Towaliga River, Big Sandy Creek, Tussahaw Creek, and Yellow Water Creek. Jackson Lake and High Falls Lake also are partially within the county. Many watersheds supply perennial streams throughout the county. Water may flow only during wet periods in the upper reaches of these watersheds. Most of the perennial streams are adjacent to flood plains. Except in dredged or other artificially altered areas, these streams frequently overflow their banks onto the flood plains during periods of heavy rains.

Many manmade ponds have been constructed along streams in the county. These ponds are used for watering livestock, recreational activities, municipal water supplies, and irrigation. The county has numerous shallow ponds and wetland areas as a result of high beaver activity. These ponds and wetland areas are located along perennial streams.

Drilled or bored wells supply water throughout the county for domestic use and for private water systems. Drilled wells generally are more than 200 feet in depth. Water supplies from wells generally are adequate for domestic use; however, supply rates may be inconsistent, even in the same general area.

Climate

Prepared by the Natural Resources Conservation Service, National Water and Climate Center, Portland, Oregon.

Climate data are provided in the tables "Temperature and Precipitation," "Freeze Dates in Spring and Fall," and "Growing Season." The data were recorded at the climate station in Experiment, Georgia, in nearby Spalding County in the period 1961 to 1990.

Data on thunderstorm days, relative humidity, percent sunshine, and winds are estimated from information recorded by the First Order station in Atlanta, Georgia.

In winter, the average temperature is 44.0 degrees F and the average daily minimum temperature is 33.6 degrees. The lowest temperature on record, which occurred at Experiment on January 21, 1985, is -8 degrees. In summer, the average temperature is 77.0 degrees and the average daily maximum temperature is 87.4 degrees. The highest recorded temperature, which occurred on July 12, 1930, is 104 degrees.

Growing degree days are shown in the table "Temperature and Precipitation." They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 51.5 inches. Of this, 28.2 inches, or 55 percent, usually falls in April through October. The growing season for most crops falls within this period. About every few years, in summer or fall, a tropical weather system produces extremely heavy rains and strong winds. The heaviest 1-day rainfall was 10.5 inches, recorded on July 5, 1994. This heavy rainfall was a result of Hurricane Alberto moving inland across Georgia. Thunderstorms occur on about 50 days each year, and most occur between May and August.

The average seasonal snowfall is about 0.6 inch. The greatest snow depth at any one time was 6.0 inches, recorded on January 29, 1936. On the average, less than one day of the year has at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 83 percent. The sun shines 64 percent of the time possible in summer and 52 percent of the time possible in winter. The prevailing wind is from the northwest. Average windspeed is highest, between 10 and 11 miles per hour, in January through April.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet

local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Chewacla-Wehadkee-Toccoa

Dominantly nearly level, well drained to very poorly drained soils that have a loamy surface and a loamy subsoil; on flood plains

Setting

Landscape: Piedmont
Landform: Flood plains
Landform position: Chewacla—on the slightly lower parts of the flood plains; Wehadkee—in depressions, backswamps, and sloughs of the flood plains; Toccoa—on the slightly higher parts of the flood plains closer to the stream channels
Slope: 0 to 2 percent
Flooding: Frequently flooded
Hydrologic features: Sloughs, depressions, and beaver ponds occur throughout the map unit

Composition

Percent of the survey area: 2 percent
Chewacla soils: 50 percent
Wehadkee soils: 10 percent
Toccoa soils: 10 percent
Minor soils: 30 percent

Soil Characteristics

Chewacla
Surface layer: Dark brown loam
Subsoil: Upper part—brown clay loam; next part—very dark grayish brown clay loam that has yellowish red masses of oxidized iron; lower part—very dark gray sandy clay loam
Substratum: Gray sandy clay loam

Wehadkee
Surface layer: Dark grayish brown loam that has common fine prominent strong brown oxidized rhizospheres
Subsoil: Grayish brown clay loam
Substratum: Upper part—grayish brown loamy sand; next part—dark grayish brown sandy clay loam; lower part—dark grayish brown loamy sand

Toccoa
Surface layer: Brown fine sandy loam
Underlying material: Upper part—strong brown sandy loam; next part—yellowish red sandy loam; next part—yellowish red loamy sand; next part—yellowish red sandy loam; next part—strong brown loam that has brown iron depletions and dark yellowish brown masses of oxidized iron
Distinctive features: Bedding planes and thin strata of sandy or loamy texture occur throughout the C horizons

Minor soils
- Buncombe soils, which are on the adjacent natural levees
- Cecil, Madison, and Pacolet soils, which are on the adjacent backslopes of hills

Use and Management

Major uses: Woodland and wetland wildlife habitat

Cropland
Management concerns: Seasonal flooding and wetness

Pasture and hayland
Management concerns: Seasonal flooding and wetness

Woodland
Management concerns: Seasonal flooding and wetness

Urban development
Management concerns: Seasonal flooding and wetness

Recreational development
Management concerns: Seasonal flooding and wetness

2. Cecil-Pacolet-Madison

Dominantly gently sloping to sloping, well drained soils that have a loamy surface and a clayey subsoil; on uplands

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Cecil and Madison—summits and backslopes; Pacolet—backslopes
Slope: 2 to 10 percent
Hydrologic features: A few intermittent drainageways

Composition

Percent of the survey area: 30 percent
Cecil soils: 65 percent
Pacolet soils: 15 percent
Madison soils: 10 percent
Minor soils: 10 percent

Soil Characteristics

Cecil
Surface layer: Brown sandy loam
Subsoil: Upper part—reddish brown sandy clay loam; next part—red sandy clay; next part—red sandy clay that has reddish yellow mottles; lower part—red sandy clay loam that has reddish yellow mottles
Substratum: Red and reddish yellow saprolite that crushes to sandy clay loam

Pacolet
Surface layer: Dark yellowish brown sandy loam
Subsoil: Upper part—red sandy clay; next part—red sandy clay that has reddish yellow mottles; lower part—red sandy clay loam that has yellowish red and pink mottles
Substratum: Upper part—multicolored red, yellowish red, and pink saprolite that crushes to sandy clay loam; lower part—multicolored red, yellowish red, and very pale brown saprolite that crushes to sandy loam

Madison
Surface layer: Yellowish brown sandy loam
Subsoil: Upper part—yellowish red sandy clay; next part—red clay; next part—red sandy clay; lower part—red sandy clay loam that has yellow and strong brown mottles
Substratum: Upper part—multicolored yellowish red, brown, and reddish yellow saprolite that crushes to sandy clay loam; lower part—multicolored yellowish red, brown, and reddish yellow saprolite that crushes to sandy loam

Minor soils
- Chewacla soils, which are on adjacent flood plains
- Random areas of Bethlehem, Lloyd, and Saw soils
- Random areas of Cataula and Hard Labor soils, which are on the lower or more concave parts of the landscape

Use and Management

Major uses: Mainly woodland and pasture; some cropland

Cropland
Management concerns: Erosion in unprotected areas

Pasture and hayland
Management concerns: Erosion in unprotected areas

Woodland
Management concerns: No significant limitations

Urban development
Management concerns: Moderate permeability in the subsoil, which affects septic tank absorption fields

Recreational development
Management concerns: Erosion in unprotected areas

3. Cecil-Hard Labor

Dominantly gently sloping to sloping, well drained soils that have a loamy surface and a clayey subsoil; on uplands

Setting

Landscape: Piedmont
Landform: Hills

Landform position: Cecil—summits and backslopes; Hard Labor—backslopes and footslopes
Slope: 2 to 10 percent
Hydrologic features: A few intermittent drainageways

Composition

Percent of the survey area: 16 percent
Cecil soils: 45 percent
Hard Labor and similar soils: 25 percent
Minor soils: 30 percent

Cecil
Surface layer: Brown sandy loam
Subsoil: Upper part—reddish brown sandy clay loam; next part—red sandy clay; next part—red sandy clay that has reddish yellow mottles; lower part—red sandy clay loam that has reddish yellow mottles
Substratum: Red and reddish yellow saprolite that crushes to sandy clay loam

Hard Labor
Surface layer: Dark brown sandy loam
Subsurface layer: Yellowish brown sandy clay loam
Subsoil: Upper part—yellowish brown sandy clay; next part—yellowish brown clay that has red masses of oxidized iron; next part—yellowish brown and red sandy clay that has light brownish gray iron depletions; lower part—yellowish brown and red sandy clay that has very pale brown iron depletions

Minor soils
- Helena soils, which are on footslopes and toeslopes
- Chewacla soils, which are on adjacent flood plains
- Random areas of Lloyd, Madison, and Pacolet soils

Use and Management

Major uses: Mainly woodland and pasture; some cropland

Cropland
Management concerns: Erosion in unprotected areas

Pasture and hayland
Management concerns: Erosion in unprotected areas

Woodland
Management concerns: No significant limitations

Urban development
Management concerns: Seasonal wetness and slow permeability in the subsoil, which severely limits the use of this soil for septic tank absorption fields

Recreational development
Management concerns: Erosion in unprotected areas

4. Pacolet-Cecil-Madison

Dominantly sloping to steep, well drained soils that have a loamy surface and a clayey subsoil; on uplands

Setting

Landscape: Piedmont
Landform: Hills

Landform position: Pacolet and Madison—shoulders and backslopes; Cecil—gently sloping to sloping summits and backslopes
Slope: 10 to 30 percent
Hydrologic features: Intermittent drainageways and perennial streams

Composition

Percent of the survey area: 52 percent
Pacolet soils: 35 percent
Cecil soils: 20 percent
Madison soils: 20 percent
Minor soils: 25 percent

Soil Characteristics

Pacolet
Surface layer: Dark yellowish brown sandy loam
Subsoil: Upper part—red sandy clay; next part—red sandy clay that has reddish yellow mottles; lower part—red sandy clay loam that has yellowish red and pink mottles
Substratum: Upper part—multicolored red, yellowish red, and pink saprolite that crushes to sandy clay loam; lower part—multicolored red, yellowish red, and very pale brown saprolite that crushes to sandy loam

Cecil
Surface layer: Brown sandy loam
Subsoil: Upper part—reddish brown sandy clay loam; next part—red sandy clay; next part—red sandy clay that has reddish yellow mottles; lower part—red sandy clay loam that has reddish yellow mottles
Substratum: Red and reddish yellow saprolite that crushes to sandy clay loam

Madison
Surface layer: Yellowish brown sandy loam
Subsoil: Upper part—yellowish red sandy clay; next part—red clay; next part—red sandy clay; lower part—red sandy clay loam that has yellow and strong brown mottles
Substratum: Upper part—multicolored yellowish red, brown, and reddish yellow saprolite that crushes to sandy clay loam; lower part—multicolored yellowish red, brown, and reddish yellow saprolite that crushes to sandy loam

Minor soils
- Chewacla soils, which are on adjacent flood plains
- Random areas of Bethlehem, Lloyd, and Saw soils

Use and Management

Major uses: Mainly woodland and pasture

Cropland
Management concerns: Erosion in unprotected areas, slope, and surface stones

Pasture and hayland
Management concerns: Erosion in unprotected areas, slope, and surface stones

Woodland
Management concerns: Erosion in unprotected areas; moderately steep slopes, which limit the use of heavy equipment; windthrow in areas of the Saw soils, which result from the depth to hard bedrock

Urban development

Management concerns: Slope; moderate permeability in the subsoil, which affects septic tank absorption fields; depth to hard bedrock in areas of the Saw soils; and erosion in unprotected areas

Recreational development

Management concerns: Erosion in unprotected areas and slope

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect land use. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar land use requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown

on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Cecil sandy loam, 2 to 6 percent slopes, is a phase of the Cecil series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Ashlar-Wake-Rock outcrop complex, 2 to 10 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

The table "Acreage and Proportionate Extent of the Soils" lists the map units in this survey area. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

ArC—Ashlar-Rock outcrop-Wake complex, 2 to 10 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping and sloping
Slope shape: Convex

Composition

Ashlar and similar soils—40 percent
Wake and similar soils—25 percent
Rock outcrop—30 percent
Dissimilar soils—5 percent

Typical Profile

Ashlar
Surface layer:
0 to 7 inches—yellowish brown coarse sandy loam

Subsoil:
7 to 15 inches—brownish yellow coarse sandy loam

Substratum:
15 to 25 inches—brownish yellow loamy coarse sand

Bedrock:
25 inches—hard bedrock

Wake
Surface layer:
0 to 4 inches—very dark grayish brown loamy sand

Substratum:
4 to 14 inches—dark yellowish brown loamy sand

Bedrock:
14 inches—hard bedrock

Rock outcrop
Exposed granite or granite gneiss rock that is hard (fig. 2)

Soil Properties and Qualities

Depth class: Ashlar—moderately deep; Wake—shallow
Drainage class: Excessively drained
Permeability: Ashlar—moderately rapid; Wake—rapid
Available water capacity: Ashlar—very low or low; Wake—very low
Natural fertility: Low
Content of organic matter in the surface layer: Low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Random areas of Pacolet soils, which have a clayey subsoil and have bedrock at a depth of more than 60 inches
- Random areas of Saw soils, which have a clayey subsoil
- Random areas of soils that have a clayey subsoil and have bedrock at a depth of less than 20 inches

Land Use

Dominant uses: Woodland
Other uses: Pasture

Cropland
Suitability: Ashlar and Wake—poorly suited; Rock outcrop—unsuited

Figure 2.—A rock outcrop in an area of Ashlar-Rock outcrop-Wake complex, 2 to 10 percent slopes. Ashlar and Wake soils are in the wooded area in the background. These areas support many unique plant and animal species.

Management concerns:
- Erosion in unprotected areas
- Limited rooting depth because of depth to hard bedrock
- Low available water capacity

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- Returning crop residue to the soil helps to retain soil moisture.

Pasture and hayland
Suitability: Ashlar and Wake—moderately suited; Rock outcrop—unsuited
Management concerns:
- Erosion in unprotected areas
- Limited rooting depth because of depth to hard bedrock
- Low available water capacity

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- Irrigation can improve the production of pasture and hay crops.

Woodland
Productivity class: Ashlar—moderate for loblolly pine; Wake—low for loblolly pine
Management concerns:
- Windthrow, which results from the limited rooting depth that is caused by the depth to hard bedrock
- Seedling mortality, which results from the droughty nature of the soil

Management measures and considerations:
- Maintaining surface litter, which increases water infiltration and minimizes evaporation, reduces seedling mortality rates.

Urban development
Suitability: Ashlar—poorly suited; Wake and Rock outcrop—unsuited
Management concerns:
- Depth to bedrock

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system in areas of the Ashlar soil.

Recreational development
Suitability: Ashlar—moderately suited; Wake and Rock outcrop—poorly suited
Management concerns:
- Slope
- Depth to hard bedrock

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: Ashlar—4e; Wake—4s; Rock outcrop—8s

AwE—Ashlar-Wake complex, 15 to 25 percent slopes

Setting

Landscape: Piedmont
Landform: Hills

Landform position: Backslopes
Slope: Moderately steep
Slope shape: Mainly convex

Composition

Ashlar and similar soils—60 percent
Wake and similar soils—20 percent
Dissimilar soils—20 percent

Typical Profile

Ashlar
Surface layer:
0 to 7 inches—yellowish brown coarse sandy loam

Subsoil:
7 to 15 inches—brownish yellow coarse sandy loam

Substratum:
15 to 25 inches—brownish yellow loamy coarse sand

Bedrock:
25 inches—hard bedrock

Wake
Surface layer:
0 to 4 inches—very dark grayish brown loamy sand

Substratum:
4 to 14 inches—dark yellowish brown loamy sand

Bedrock:
14 inches—hard bedrock

Soil Properties and Qualities

Depth class: Ashlar—moderately deep; Wake—shallow
Drainage class: Excessively drained
Permeability: Ashlar—moderately rapid; Wake—rapid
Available water capacity: Ashlar—very low or low; Wake—very low
Natural fertility: Low
Content of organic matter in the surface layer: Low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Random areas of Saw soils, which have a clayey subsoil
- A few small areas of soils that have extremely stony surfaces located on shoulders
- Random areas of very deep soils that have a fine-loamy subsoil

Land Use

Dominant uses: Woodland

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope
- Limited rooting depth because of depth to hard bedrock

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Limited rooting depth because of depth to hard bedrock

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.
- Irrigation can improve the production of pasture and hay crops.

Woodland
Productivity class: Ashlar—moderate for loblolly pine; Wake—low for loblolly pine
Management concerns:
- Erosion in unprotected areas
- Moderately steep slopes that limit the use of heavy equipment
- Windthrow, which results from the limited rooting depth that is caused by the depth to hard bedrock
- Seedling mortality, which results from the droughty nature of the soil

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Ashlar—poorly suited; Wake—unsuited
Management concerns:
- Slope
- Depth to bedrock
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system in areas of the Ashlar soil.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Depth to bedrock

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: Ashlar—6e; Wake—6s

BwB—Buncombe loamy sand, 0 to 6 percent slopes, occasionally flooded

Setting

Landscape: Piedmont
Landform: Stream levees

Slope: Nearly level and gently sloping
Slope shape: Linear to convex

Composition

Buncombe and similar soils—80 percent
Dissimilar soils—20 percent

Typical Profile

Surface layer:
0 to 10 inches—dark yellowish brown loamy sand

Underlying material:
10 to 35 inches—yellowish brown sand
35 to 55 inches—yellowish brown sand that has brownish yellow mottles
55 to 60 inches—dark yellowish brown loamy sand that has brownish yellow mottles

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Available water capacity: Low
Flooding: Occasional
Natural fertility: Low
Content of organic matter in the surface layer: Low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Somewhat poorly drained Chewacla soils, which are located in the lower positions on flood plains
- Random areas of Toccoa soils, which are moderately well drained and well drained

Land Use

Dominant uses: Woodland
Other uses: Pasture

Cropland
Suitability: Poorly suited
Management concerns:
- Flooding
- Low available water capacity

Management measures and considerations:
- Irrigation may improve the production of crops in areas of this map unit.

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Flooding
- Low available water capacity

Management measures and considerations:
- Irrigation may improve the production of pasture and hay crops.

Woodland
Productivity class: Moderately high for loblolly pine

Management concerns:
- Seasonal flooding that limits the use of heavy equipment
- Seedling mortality, which results from the droughty nature of the soil

Management measures and considerations:
- Hand planting reduces the need for heavy machinery.

Urban development
Suitability: Unsuited
Management concerns:
- Flooding
- Poor filtration that may affect septic tank absorption fields

Recreational development
Suitability: Moderately suited
Management concerns:
- Flooding
- Sandiness

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 4w

CaB—Cataula sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes and footslopes
Slope: Gently sloping
Slope shape: Slightly concave and linear

Composition

Cataula and similar soils—85 percent
Dissimilar soils—15 percent

Typical Profile

Surface layer:
0 to 4 inches—dark yellowish brown sandy loam

Subsurface layer:
4 to 7 inches—yellowish brown sandy loam

Subsoil:
7 to 23 inches—red clay
23 to 30 inches—red clay that has pale brown iron depletions and brownish yellow masses of oxidized iron
30 to 40 inches—red clay that has light brownish gray and pale brown iron depletions and brownish yellow masses of oxidized iron
40 to 52 inches—red and brownish yellow sandy clay that has light brownish gray iron depletions

Substratum:
52 to 60 inches—red sandy clay loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Seasonal high water table: Perched, at a depth of 2.5 to 3.3 feet from December through April
Permeability: Slow
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Well drained Cecil and Madison soils, which are located in the higher positions or the more convex areas of the landscape
- Random areas of soils that have a seasonal high water table at a depth of 3.3 to 5.0 feet

Land Use

Dominant uses: Pasture
Other uses: Cropland and woodland

Cropland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Poorly suited or moderately suited
Management concerns:
- Slow permeability in the subsoil
- Wetness, which limits the use of this soil for septic tank absorption fields

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Moderately suited

Management concerns:
- Seasonal wetness, which limits the use of this soil

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Interpretive Group

Land capability classification: 2e

CeB—Cecil sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping
Slope shape: Convex

Composition

Cecil and similar soils—85 percent
Dissimilar soils—15 percent

Typical Profile

Surface layer:
0 to 8 inches—brown sandy loam

Subsoil:
8 to 11 inches—reddish brown sandy clay loam
11 to 24 inches—red sandy clay
24 to 37 inches—red sandy clay that has reddish yellow mottles
37 to 48 inches—red sandy clay loam that has reddish yellow mottles

Substratum:
48 to 60 inches—red and reddish yellow sandy clay loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Moderately well drained Cataula soils, which are located in the lower positions or the more concave areas of the landscape
- Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches and are located on summits and shoulders
- A few areas of soils that have a loamy subsoil, have occasional, very brief flooding, and are located in swales

Land Use

Dominant uses: Pasture and cropland
Other uses: Woodland

Cropland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.

Pasture and hayland
Suitability: Well suited (fig. 3)
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Well suited
Management concerns:
- Moderate permeability in the subsoil, which may affect septic tank absorption fields

Figure 3.—A hayfield in an area of Cecil sandy loam, 2 to 6 percent slopes. This soil is very productive and responds well to applications of lime and fertilizer.

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Well suited
Management concerns:
- No significant limitations

Interpretive Group

Land capability classification: 2e

CeC2—Cecil sandy loam, 6 to 10 percent slopes, moderately eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Sloping
Slope shape: Convex

Composition

Cecil and similar soils—95 percent
Dissimilar soils—5 percent

Typical Profile

Surface layer:
0 to 8 inches—brown sandy loam

Subsoil:
8 to 11 inches—reddish brown sandy clay loam
11 to 24 inches—red sandy clay
24 to 37 inches—red sandy clay that has reddish yellow mottles
37 to 48 inches—red sandy clay loam that has reddish yellow mottles

Substratum:
48 to 60 inches—red and reddish yellow sandy clay loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Moderately well drained Cataula soils, which are located in the lower positions or the more concave areas of the landscape

- Random areas of Saw soils, which have hard bedrock at a depth of 22 to 40 inches
- Random areas of soils that have a dark red subsoil and have soft bedrock at a depth of 40 to 60 inches

Land Use

Dominant uses: Pasture and cropland
Other uses: Woodland

Cropland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.
- Including seasonal cover crops in the cropping system helps to prevent further erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Moderately suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 3e

CfB2—Cecil sandy clay loam, 2 to 6 percent slopes, moderately eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping
Slope shape: Convex

Composition

Cecil and similar soils—95 percent
Dissimilar soils—5 percent

Typical Profile

Surface layer:
0 to 4 inches—red sandy clay loam

Subsoil:
4 to 26 inches—red clay
26 to 43 inches—red clay that has yellowish brown mottles
43 to 50 inches—red sandy clay loam that has reddish yellow and strong brown mottles

Substratum:
50 to 60 inches—mottled red, strong brown, and reddish yellow loamy saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor
Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Moderately well drained Cataula soils, which are located in the lower positions or the more concave areas of the landscape

Land Use

Dominant uses: Pasture and cropland
Other uses: Woodland

Cropland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.

- Including seasonal cover crops in the cropping system helps to prevent further erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Limitations on equipment use
- Seedling mortality, which results from the sandy clay loam surface layer

Management measures and considerations:
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Well suited
Management concerns:
- Moderate permeability in the subsoil, which may affect septic tank absorption fields

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Well suited
Management concerns:
- No significant limitations

Interpretive Group

Land capability classification: 3e

CfC3—Cecil sandy clay loam, 6 to 10 percent slopes, severely eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Sloping
Slope shape: Convex

Composition

Cecil and similar soils—95 percent
Dissimilar soils—5 percent

Typical Profile

Surface layer:
0 to 4 inches—red sandy clay loam

Subsoil:
4 to 26 inches—red clay
26 to 43 inches—red clay that has yellowish brown mottles
43 to 50 inches—red sandy clay loam that has reddish yellow and strong brown mottles

Substratum:
50 to 60 inches—multicolored red, strong brown, and reddish yellow loamy saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor
Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Random areas of Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches
- Moderately well drained Cataula soils, which are located in the lower positions or the more concave areas of the landscape

Land Use

Dominant uses: Pasture and woodland

Cropland
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.
- Including seasonal cover crops in the cropping system helps to prevent further erosion.

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Limitations on equipment use
- Seedling mortality, which results from the sandy clay loam surface layer

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.

- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Moderately suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 4e

CuC—Cecil-Urban land complex, 2 to 10 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping and sloping
Slope shape: Convex

Composition

Cecil and similar soils—50 percent
Urban land—35 percent
Dissimilar soils—15 percent

Typical Profile

Cecil
Surface layer:
0 to 8 inches—brown sandy loam

Subsoil:
8 to 11 inches—reddish brown sandy clay loam
11 to 24 inches—red sandy clay
24 to 37 inches—red sandy clay that has reddish yellow mottles
37 to 48 inches—red sandy clay loam that has reddish yellow mottles

Substratum:
48 to 60 inches—red and reddish yellow sandy clay loam saprolite

Urban land

Urban land consists of areas that have been altered by cutting, filling, and shaping. Schools, parking lots, streets, commercial buildings, and residential dwellings are located in these areas.

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Other distinctive properties: Soils in this unit have been altered by cutting, filling, and shaping; schools, parking lots, streets, commercial buildings, and residential dwellings are features of the landscape.

Minor Components

Dissimilar

- Random areas of Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches
- Moderately well drained Cataula soils, which are located in the lower positions or the more concave areas of the landscape

Land Use

Dominant uses: Urban land

Cropland
Suitability: Unsuited
Management concerns:

- Limited size of areas

Pasture and hayland
Suitability: Unsuited
Management concerns:

- Limited size of areas

Woodland
Productivity class: None assigned
Management concerns:

- Limited size of areas

Urban development
Suitability: Moderately suited
Management concerns:

- Slope
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:

- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Moderately suited

Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 8s

CwA—Chewacla loam, 0 to 2 percent slopes, frequently flooded

Setting

Landscape: Piedmont
Landform: Flood plains
Slope: Nearly level
Slope shape: Slightly concave and linear

Composition

Chewacla and similar soils—90 percent
Dissimilar soils—10 percent

Typical Profile

Surface layer:
0 to 6 inches—dark brown loam

Subsoil:
6 to 25 inches—brown clay loam
25 to 30 inches—very dark grayish brown clay loam that has yellowish red masses of oxidized iron
30 to 40 inches—very dark gray sandy clay loam

Substratum:
40 to 60 inches—gray sandy clay loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Somewhat poorly drained
Seasonal high water table: Apparent, at a depth of 0.5 to 2.0 feet from December through April
Permeability: Moderate
Available water capacity: High
Flooding: Frequent
Natural fertility: Medium
Content of organic matter in the surface layer: Moderate
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Excessively drained Buncombe soils, which are located on the adjacent natural levees

- Moderately well drained and well drained Toccoa soils, which are located in the higher positions on flood plains
- Very poorly drained and poorly drained Wehadkee soils, which are located in depressions and backswamp areas

Land Use

Dominant uses: Woodland

Cropland
Suitability: Poorly suited
Management concerns:
- Seasonal wetness
- Flooding

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Seasonal wetness
- Flooding

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Woodland
Productivity class: High for loblolly pine
Management concerns:
- Seasonal wetness and flooding, which limit the use of heavy equipment

Management measures and considerations:
- Harvesting operations should be performed during the drier periods.
- Hand planting reduces the need for heavy equipment.

Urban development
Suitability: Unsuited
Management concerns:
- Seasonal wetness
- Flooding

Recreational development
Suitability: Poorly suited
Management concerns:
- Seasonal wetness
- Flooding

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Interpretive Group

Land capability classification: 4w

DAM—Dam

This map unit is made up of the Jackson Lake and Chief McIntosh Lake Dams. The Jackson Lake Dam is a concrete barrier that obstructs the flow of water from the Yellow, South, and Alcovy Rivers. The Chief McIntosh Lake Dam is an earthen barrier that obstructs the flow of water from Big Sandy Creek and Long Branch.

This map unit is not assigned a capability class.

HaB—Hard Labor sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes and footslopes
Slope: Gently sloping
Slope shape: Slightly concave

Composition

Hard Labor and similar soils—75 percent
Dissimilar soils—25 percent

Typical Profile

Surface layer:
0 to 9 inches—dark brown sandy loam

Subsurface layer:
9 to 15 inches—yellowish brown sandy clay loam

Subsoil:
15 to 26 inches—yellowish brown sandy clay
26 to 36 inches—yellowish brown clay that has red masses of oxidized iron
36 to 50 inches—yellowish brown and red sandy clay that has light brownish gray iron depletions
50 to 60 inches—yellowish brown and red sandy clay that has very pale brown iron depletions

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Seasonal high water table: Perched, at a depth of 2.5 to 3.3 feet from December through April (fig. 4)
Permeability: Slow
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Helena soils, which have a seasonal high water table at a depth of 1.5 to 2.5 feet and are located in the lower positions or the more concave areas of the landscape
- Well drained Cecil and Pacolet soils, which are located in the higher positions or the more convex areas of the landscape
- Random areas of well drained soils that have a loamy subsoil

Land Use

Dominant uses: Pasture
Dominant uses: Woodland and cropland

Cropland
Suitability: Well suited

Figure 4.—A Christmas tree farm in an area of Hard Labor sandy loam, 2 to 6 percent slopes. This soil has a perched high water table during the late winter and early spring.

Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: High for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Poorly suited or moderately suited
Management concerns:
- Seasonal wetness, which limits the use of this soil for building site development
- Slow permeability in the subsoil and wetness, which limit the use of this soil for septic tank absorption fields

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Moderately suited
Management concerns:
- Seasonal wetness, which limits the use of this soil

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Interpretive Group

Land capability classification: 2e

HzB—Helena sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Footslopes and toeslopes
Slope: Gently sloping
Slope shape: Concave

Composition

Helena and similar soils—80 percent
Dissimilar soils—20 percent

Typical Profile

Surface layer:
0 to 8 inches—dark yellowish brown sandy loam

Subsurface layer:
8 to 11 inches—yellowish brown sandy loam

Subsoil:
11 to 20 inches—yellowish brown sandy clay
20 to 30 inches—yellowish brown sandy clay that has light brownish gray iron depletions
30 to 35 inches—light gray sandy clay that has yellowish brown masses of oxidized iron
35 to 45 inches—light gray sandy clay loam that has yellowish brown masses of oxidized iron

Substratum:
45 to 60 inches—light gray sandy loam that has yellow and yellowish red masses of oxidized iron

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Seasonal high water table: Perched, at a depth of 1.5 to 2.5 feet from December through April
Permeability: Slow
Available water capacity: Moderate
Shrink-swell potential: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low

Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar:
- Cataula and Hard Labor soils, which have a seasonal high water table at a depth of 2.5 to 3.3 feet and are located in the slightly higher positions
- Well drained Pacolet soils, which are located in the higher positions or the more convex areas of the landscape
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland and pasture
Other uses: Cropland

Cropland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Poorly suited
Management concerns:
- Seasonal wetness and shrink-swell potential limit the use of this soil for building site development
- Slow permeability in the subsoil and wetness, which limit the use of this soil for septic tank absorption fields

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Moderately suited
Management concerns:
- Seasonal wetness, which limits the use of this soil

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Interpretive Group

Land capability classification: 2e

HzC—Helena sandy loam, 6 to 10 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes, footslopes, and toeslopes
Slope: Sloping
Slope shape: Concave to linear

Composition

Helena and similar soils—75 percent
Dissimilar soils—25 percent

Typical Profile

Surface layer:
0 to 8 inches—dark yellowish brown sandy loam

Subsurface layer:
8 to 11 inches—yellowish brown sandy loam

Subsoil:
11 to 20 inches—yellowish brown sandy clay
20 to 30 inches—yellowish brown sandy clay that has light brownish gray iron depletions
30 to 35 inches—light gray sandy clay that has yellowish brown masses of oxidized iron
35 to 45 inches—light gray sandy clay loam that has yellowish brown masses of oxidized iron

Substratum:
45 to 60 inches—light gray sandy loam that has yellow and yellowish red masses of oxidized iron

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Seasonal high water table: Perched, at a depth of 1.5 to 2.5 feet from December through April
Permeability: Slow
Available water capacity: Moderate
Shrink-swell potential: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor components

Dissimilar:
- Cataula and Hard Labor soils, which have a seasonal high water table at a depth of 2.5 to 3.3 feet and are located in the slightly higher positions
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland and pasture
Other uses: Cropland

Cropland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Poorly suited
Management concerns:
- Seasonal wetness and shrink-swell potential limit the use of this soil for building site development
- Slow permeability in the subsoil and wetness, which limit the use of this soil for septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Seasonal wetness, which limits the use of this soil

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Interpretive Group

Land capability classification: 3e

LdB—Lloyd sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping
Slope shape: Convex

Composition

Lloyd and similar soils—95 percent
Dissimilar soils—5 percent

Typical Profile

Surface layer:
0 to 10 inches—dark brown sandy loam

Subsoil:
10 to 20 inches—dark reddish brown clay
20 to 55 inches—dark red clay
55 to 60 inches—red clay loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Moderately well drained Cataula soils, which are located in the lower positions or the more concave areas of the landscape
- A few areas of soils that have a loamy subsoil, have occasional, very brief flooding, and are located in swales

Land Use

Dominant uses: Pasture and woodland
Other uses: Cropland

Cropland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderately high for loblolly pine (fig. 5)
Management concerns:
- No significant limitations

Urban development
Suitability: Well suited

Figure 5.—Managed forestland in an area of Lloyd sandy loam, 2 to 6 percent slopes. This soil is well suited to pine tree production. This stand has been thinned recently.

Management concerns:
- Moderate permeability in the subsoil, which may affect septic tank absorption fields

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Well suited
Management concerns:
- No significant limitations

Interpretive Group

Land capability classification: 2e

LfB3—Lloyd sandy clay loam, 2 to 6 percent slopes, severely eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping
Slope shape: Convex

Composition

Lloyd and similar soils—85 percent
Dissimilar soils—15 percent

Typical Profile

Surface layer:
0 to 4 inches—yellowish red sandy clay loam

Subsoil:
4 to 25 inches—dark red clay
25 to 35 inches—red clay
35 to 59 inches—red sandy clay loam that has strong brown mottles

Substratum:
59 to 60 inches—yellowish red sandy loam and sandy clay loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor
Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Moderately well drained Cataula soils, which are located in the lower positions or the more concave areas of the landscape
- Random areas of soils that have a seasonal high water table at a depth of 3.3 to 5.0 feet

Land Use

Dominant uses: Pasture and woodland
Other uses: Cropland

Cropland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.
- Including seasonal cover crops in the cropping system helps to prevent further erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Limitations on equipment use

- Seedling mortality, which results from the sandy clay loam surface layer

Management measures and considerations:

- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development

Suitability: Well suited

Management concerns:

- Moderate permeability in the subsoil, which may affect septic tank absorption fields

Management measures and considerations:

- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development

Suitability: Well suited

Management concerns:

- No significant limitations

Interpretive Group

Land capability classification: 3e

LfD3—Lloyd sandy clay loam, 6 to 15 percent slopes, severely eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Shoulders and backslopes
Slope: Sloping and strongly sloping
Slope shape: Mainly convex

Composition

Lloyd and similar soils—95 percent
Dissimilar soils—5 percent

Typical Profile

Surface layer:
0 to 4 inches—yellowish red sandy clay loam

Subsoil:
4 to 25 inches—dark red clay
25 to 35 inches—red clay
35 to 59 inches—red sandy clay loam that has strong brown mottles

Substratum:
59 to 60 inches—yellowish red sandy loam and sandy clay loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate

Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor
Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches and are located on summits and shoulders
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland
Other uses: Pasture

Cropland
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.
- Including seasonal cover crops in the cropping system helps to prevent further erosion.

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- A water management system reduces the hazard of erosion.
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Limitations on equipment use
- Seedling mortality, which results from the sandy clay loam surface layer

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Moderately suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 4e

MaB2—Madison sandy loam, 2 to 6 percent slopes, moderately eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping
Slope shape: Convex

Composition

Madison and similar soils—80 percent
Dissimilar soils—20 percent

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—multicolored yellowish red, brown, and reddish yellow sandy clay loam saprolite
50 to 60 inches—multicolored yellowish red, brown, and reddish yellow sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate

Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: Common or many flakes of mica in the upper part of the solum and many flakes of mica in the lower part of the solum

Minor Components

Dissimilar
- Random areas of Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches
- Moderately well drained Cataula and Hard Labor soils, which are located in the lower positions or the more concave areas of the landscape

Land Use

Dominant uses: Pasture and woodland
Other uses: Cropland

Cropland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- Including seasonal cover crops in the cropping system helps to prevent further erosion.

Pasture and hayland
Suitability: Well suited (fig. 6)
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Well suited
Management concerns:
- Moderate permeability in the subsoil, which may affect septic tank absorption fields

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Well suited
Management concerns:
- No significant limitations

Interpretive Group

Land capability classification: 2e

Figure 6.—A pasture planted in fescue in an area of Madison sandy clay loam, 2 to 6 percent slopes, moderately eroded. The sandy clay loam surface layer is a mixture of the original topsoil and the upper part of the subsoil, but it responds well to proper management for pasture production.

MaD2—Madison sandy loam, 6 to 15 percent slopes, moderately eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Shoulders and backslopes
Slope: Sloping and strongly sloping
Slope shape: Mainly convex

Composition

Madison and similar soils—75 percent
Dissimilar soils—25 percent

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—multicolored yellowish red, brown, and reddish yellow sandy clay loam saprolite
50 to 60 inches—multicolored yellowish red, brown, and reddish yellow sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: Common or many flakes of mica in the upper part of the solum and many flakes of mica in the lower part of the solum

Minor Components

Dissimilar
- Random areas of Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches
- Moderately well drained Cataula, Hard Labor, and Helena soils, which are located in the lower positions or the more concave areas of the landscape
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland
Other uses: Pasture

Cropland
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.
- Including seasonal cover crops in the cropping system helps to prevent further erosion.

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- A water management system reduces the hazard of erosion.
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Moderately suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 4e

MaE2—Madison sandy loam, 15 to 30 percent slopes, moderately eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes
Slope: Moderately steep and steep
Slope shape: Mainly convex

Composition

Madison and similar soils—75 percent
Dissimilar soils—25 percent

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—multicolored yellowish red, brown, and reddish yellow sandy clay loam saprolite
50 to 60 inches—multicolored yellowish red, brown, and reddish yellow sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: Common or many flakes of mica in the upper part of the solum and many flakes of mica in the lower part of the solum

Minor Components

Dissimilar
- Random areas of Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches
- Random areas of Saw soils, which have hard bedrock at a depth of 22 to 40 inches
- Moderately well drained Cataula, Hard Labor, and Helena soils, which are located in the lower positions or the more concave areas of the landscape
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland
Other uses: Pasture

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope

Pasture and hayland
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- Erosion in unprotected areas
- Moderately steep or steep slopes that limit the use of heavy equipment

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Poorly suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 7e

MdB3—Madison sandy clay loam, 2 to 6 percent slopes, severely eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping
Slope shape: Convex

Composition

Madison and similar soils—95 percent
Dissimilar soils—5 percent

Typical Profile

Surface layer:
0 to 4 inches—brown sandy clay loam

Subsoil:
4 to 20 inches—red clay
20 to 45 inches—yellowish red sandy clay loam

Substratum:
45 to 60 inches—multicolored sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor
Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Moderately well drained Cataula and Hard Labor soils, which are located in the lower positions or the more concave areas of the landscape
- Random areas of Saw soils, which have hard bedrock at a depth of 22 to 40 inches

Land Use

Dominant uses: Woodland and pasture

Cropland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.
- Including seasonal cover crops in the cropping system helps to prevent further erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Limitations on equipment use
- Seedling mortality, which results from the sandy clay loam surface layer

Management measures and considerations:
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Well suited
Management concerns:
- Moderate permeability in the subsoil, which may affect septic tank absorption fields

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Well suited
Management concerns:
- No significant limitations

Interpretive Group

Land capability classification: 3e

MdD3—Madison sandy clay loam, 6 to 15 percent slopes, severely eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Shoulders and backslopes
Slope: Sloping and strongly sloping
Slope shape: Mainly convex

Composition

Madison and similar soils—85 percent
Dissimilar soils—15 percent

Typical Profile

Surface layer:
0 to 4 inches—brown sandy clay loam

Subsoil:
4 to 20 inches—red clay
20 to 45 inches—yellowish red sandy clay loam

Substratum:
45 to 60 inches—multicolored sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor
Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Moderately well drained Cataula and Hard Labor soils, which are located in the lower positions or the more concave areas of the landscape
- Random areas of Saw soils, which have hard bedrock at a depth of 22 to 40 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland
Other uses: Pasture

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Limitations on equipment use
- Seedling mortality, which results from the sandy clay loam surface layer

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Moderately suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 6e

MdE3—Madison sandy clay loam, 15 to 30 percent slopes, severely eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes

Slope: Moderately steep and steep
Slope shape: Mainly convex

Composition

Madison and similar soils—75 percent
Dissimilar soils—25 percent

Typical Profile

Surface layer:
0 to 4 inches—brown sandy clay loam

Subsoil:
4 to 20 inches—red clay
20 to 45 inches—yellowish red sandy clay loam

Substratum:
45 to 60 inches—multicolored sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor
Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Random areas of Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches
- Moderately well drained Cataula and Hard Labor soils, which are located in the lower positions or the more concave areas of the landscape
- Random areas of Winnsboro and Wynott soils, which have soft bedrock at a depth of 42 to 60 inches and 22 to 40 inches, respectively, and have sticky and plastic clay in the subsoil
- Random areas of soils that have soft bedrock at a depth of 40 to 60 inches
- Random areas of soils that have a seasonal high water table at a depth of 3.3 to 5.0 feet
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope

Pasture and hayland
Suitability: Poorly suited

Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Erosion in unprotected areas
- Moderately steep or steep slopes that limit the use of heavy equipment

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Poorly suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 7e

MsD—Madison-Bethlehem complex, 6 to 15 percent slopes, stony

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Shoulders and backslopes
Slope: Sloping and strongly sloping
Slope shape: Mainly convex

Composition

Madison and similar soils—45 percent
Bethlehem and similar soils—35 percent
Dissimilar soils—20 percent

Typical Profile

Madison
Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—multicolored yellowish red, reddish yellow, and brown sandy clay loam saprolite
50 to 60 inches—multicolored brown, reddish yellow, and yellowish red sandy loam saprolite

Bethlehem
Surface layer:
0 to 8 inches—dark yellowish brown gravelly sandy loam

Subsurface layer:
8 to 12 inches—yellowish red sandy clay loam

Subsoil:
12 to 21 inches—red clay
21 to 33 inches—red sandy clay

Substratum:
33 to 38 inches—multicolored red, reddish yellow, and yellow gravelly sandy loam saprolite

Bedrock:
38 inches—weathered mica schist in shades of red and brown

Soil Properties and Qualities

Depth class: Madison—very deep; Bethlehem—moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: Common or many flakes of mica in the upper part of the solum and many flakes of mica in the lower part of the solum

Minor Components

Dissimilar
- Random areas of Wilkes soils, which have soft bedrock at a depth of 10 to 20 inches
- Random areas of soils that have soft bedrock at a depth of 40 to 60 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland

Cropland
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Surface stones

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Surface stones

Management measures and considerations:
- A water management system reduces the hazard of erosion.
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Madison—moderately high for loblolly pine; Bethlehem—moderate for loblolly pine
Management concerns: Windthrow in areas of the Bethlehem soil, which results from the limited rooting depth that is caused by the depth to soft bedrock
- Periodically harvesting windthrown trees that fell as a result of a limited rooting depth helps to maintain site productivity.

Urban development
Suitability: Moderately suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Depth to soft bedrock in areas of the Bethlehem soil
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 4e

MsE—Madison-Bethlehem complex, 15 to 30 percent slopes, stony

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes
Slope: Moderately steep and steep
Slope shape: Mainly convex

Composition

Madison and similar soils—60 percent
Bethlehem and similar soils—30 percent
Dissimilar soils—10 percent

Typical Profile

Madison
Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—multicolored yellowish red, reddish yellow, and brown sandy clay loam saprolite
50 to 60 inches—multicolored brown, reddish yellow, and yellowish red sandy loam saprolite

Bethlehem
Surface layer:
0 to 8 inches—dark yellowish brown gravelly sandy loam

Subsurface layer:
8 to 12 inches—yellowish red sandy clay loam

Subsoil:
12 to 21 inches—red clay
21 to 33 inches—red sandy clay

Substratum:
33 to 38 inches—multicolored red, reddish yellow, and yellow gravelly sandy loam saprolite

Bedrock:
38 inches—weathered mica schist in shades of red and brown

Soil Properties and Qualities

Depth class: Madison—very deep; Bethlehem—moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate

Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: Common or many flakes of mica in the upper part of the solum and many flakes of mica in the lower part of the solum

Minor Components

Dissimilar
- Random areas of soils that have soft bedrock at a depth of 40 to 60 inches
- Random areas of soils that have a loamy subsoil and have hard bedrock at a depth of 20 to 40 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope
- Surface stones

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Surface stones

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Madison—moderately high for loblolly pine; Bethlehem—moderate for loblolly pine
Management concerns:
- Erosion in unprotected areas
- Moderately steep and steep slopes that limit the use of heavy equipment
- Windthrow in areas of the Bethlehem soil, which results from the limited rooting depth that is caused by the depth to soft bedrock

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Poorly suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Depth to soft bedrock in areas of the Bethlehem soil
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 7e

PaB—Pacolet sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping
Slope shape: Convex

Composition

Pacolet and similar soils—90 percent
Dissimilar soils—10 percent

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—multicolored red, yellowish red, and pink sandy clay loam saprolite
54 to 60 inches—multicolored red, yellowish red, and very pale brown sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Random areas of Ashlar and Saw soils, which have hard bedrock at a depth of 22 to 40 inches

Land Use

Dominant uses: Pasture and woodland
Other uses: Cropland

Cropland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Well suited
Management concerns:
- Moderate permeability in the subsoil, which may affect septic tank absorption fields

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Well suited
Management concerns:
- No significant limitations

Interpretive Group

Land capability classification: 2e

PaD2—Pacolet sandy loam, 6 to 15 percent slopes, moderately eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Shoulders and backslopes
Slope: Sloping and strongly sloping
Slope shape: Convex

Composition

Pacolet and similar soils—85 percent
Dissimilar soils—15 percent

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—multicolored red, yellowish red, and pink sandy clay loam saprolite
54 to 60 inches—multicolored red, yellowish red, and very pale brown sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Random areas of soils that have hard or soft bedrock at a depth of 40 to 60 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland
Other uses: Pasture and cropland

Cropland
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- A water management system reduces the hazard of erosion.
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Moderately suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 4e

PaE2—Pacolet sandy loam, 15 to 25 percent slopes, moderately eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes
Slope: Moderately steep
Slope shape: Mostly convex

Composition

Pacolet and similar soils—90 percent
Dissimilar soils—10 percent

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—multicolored red, yellowish red, and pink sandy clay loam saprolite

54 to 60 inches—multicolored red, yellowish red, and very pale brown sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Random areas of Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches
- Random areas of Saw soils, which have hard bedrock at a depth of 22 to 40 inches
- Random areas of Towaliga soils, which have an extremely gravelly surface layer
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderately high for loblolly pine
Management concerns:
- Erosion in unprotected areas
- Limitations on equipment use

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Poorly suited
Management concerns:
- Slope, which limits the use of this soil for building site development

- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:

- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited

Management concerns:

- Erosion in unprotected areas
- Slope

Management measures and considerations:

- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 6e

PfB3—Pacolet sandy clay loam, 2 to 6 percent slopes, severely eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping
Slope shape: Convex

Composition

Pacolet and similar soils—90 percent
Dissimilar soils—10 percent

Typical Profile

Surface layer:
0 to 6 inches—yellowish red sandy clay loam

Subsoil:
6 to 18 inches—red sandy clay
18 to 24 inches—red sandy clay that has strong brown mottles

Substratum:
24 to 60 inches—reddish brown and white sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor

Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Random areas of Saw soils, which have hard bedrock at a depth of 22 to 40 inches

Land Use

Dominant uses: Woodland and pasture
Other uses: Cropland

Cropland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.
- Including seasonal cover crops in the cropping system helps to prevent further erosion.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Erosion in unprotected areas

Management measures and considerations:
- A water management system reduces the hazard of erosion.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Limitations on equipment use
- Seedling mortality, which results from the sandy clay loam surface layer

Management measures and considerations:
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Well suited
Management concerns:
- Moderate permeability in the subsoil, which may affect septic tank absorption fields

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.

Recreational development
Suitability: Well suited
Management concerns:
- No significant limitations

Interpretive Group

Land capability classification: 3e

PfD3—Pacolet sandy clay loam, 6 to 15 percent slopes, severely eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Shoulders and backslopes
Slope: Sloping and strongly sloping
Slope shape: Convex

Composition

Pacolet and similar soils—85 percent
Dissimilar soils—15 percent

Typical Profile

Surface layer:
0 to 6 inches—yellowish red sandy clay loam

Subsoil:
6 to 18 inches—red sandy clay
18 to 24 inches—red sandy clay that has strong brown mottles

Substratum:
24 to 60 inches—reddish brown and white sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor
Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Moderately well drained Cataula soils, which are located in the lower positions or the more concave areas of the landscape
- Random areas of Saw soils, which have hard bedrock at a depth of 22 to 40 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland
Other uses: Pasture

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Limitations on equipment use
- Seedling mortality, which results from the sandy clay loam surface layer

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Moderately suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 6e

PfE3—Pacolet sandy clay loam, 15 to 25 percent slopes, severely eroded

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes
Slope: Moderately steep
Slope shape: Mainly convex

Composition

Pacolet and similar soils—85 percent
Dissimilar soils—15 percent

Typical Profile

Surface layer:
0 to 6 inches—yellowish red sandy clay loam

Subsoil:
6 to 18 inches—red sandy clay
18 to 24 inches—red sandy clay that has strong brown mottles

Substratum:
24 to 60 inches—reddish brown and white sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Poor
Other distinctive properties: The sandy clay loam surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Minor Components

Dissimilar
- Random areas of Saw soils, which have hard bedrock at a depth of 22 to 40 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland
Other uses: Pasture

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Erosion in unprotected areas
- Limitations on equipment use

Management measures and considerations:
- Planting on the contour helps to minimize erosion.

- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Poorly suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 7e

PsD—Pacolet-Saw complex, 6 to 15 percent slopes, stony

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Shoulders and backslopes
Slope: Sloping and strongly sloping
Slope shape: Convex

Composition

Pacolet and similar soils—45 percent
Saw and similar soils—35 percent
Dissimilar soils—20 percent

Typical Profile

Pacolet
Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—multicolored red, yellowish red, and pink sandy clay loam saprolite

54 to 60 inches—multicolored red, yellowish red, and very pale brown sandy loam saprolite

Saw
Surface layer:
0 to 6 inches—dark yellowish brown sandy loam

Subsurface layer:
6 to 11 inches—yellowish brown sandy loam

Subsoil:
11 to 28 inches—red clay

Substratum:
28 to 32 inches—red sandy clay loam saprolite that has red and strong brown mottles

Bedrock:
32 inches—hard granite gneiss

Soil Properties and Qualities

Depth class: Pacolet—very deep; Saw—moderately deep
Drainage class: Well drained
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Random areas of Ashlar soils, which have a coarse loamy subsoil and have hard bedrock at a depth of 23 to 40 inches
- Moderately well drained Helena soils, which are located in the lower positions or the more concave areas of the landscape
- Random areas of soils that have hard or soft bedrock at a depth of 40 to 60 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland

Cropland
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Surface stones

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.
- A water management system reduces the hazard of erosion.

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Surface stones

Management measures and considerations:
- A water management system reduces the hazard of erosion.
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Pacolet—moderately high for loblolly pine; Saw—moderate for loblolly pine
Management concerns:
- Windthrow in areas of the Saw soil, which results from the limited rooting depth that is caused by the depth to bedrock

Management measures and considerations:
- Periodically harvesting windthrown trees that fell as a result of a limited rooting depth helps to maintain site productivity.

Urban development
Suitability: Pacolet—moderately suited; Saw—poorly suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Depth to bedrock in areas of the Saw soil
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 4e

PsE—Pacolet-Saw complex, 15 to 25 percent slopes, stony

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes
Slope: Moderately steep
Slope shape: Mainly convex

Composition

Pacolet and similar soils—45 percent
Saw and similar soils—35 percent
Dissimilar soils—20 percent

Typical Profile

Pacolet
Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—multicolored red, yellowish red, and pink sandy clay loam saprolite
54 to 60 inches—multicolored red, yellowish red, and very pale brown sandy loam saprolite

Saw
Surface layer:
0 to 6 inches—dark yellowish brown sandy loam

Subsurface layer:
6 to 11 inches—yellowish brown sandy loam

Subsoil:
11 to 28 inches—red clay

Substratum:
28 to 32 inches—red sandy clay loam that has red and strong brown mottles

Bedrock:
32 inches—hard granite gneiss

Soil Properties and Qualities

Depth class: Pacolet—very deep; Saw—moderately deep
Drainage class: Well drained
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Random areas of Ashlar and Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches
- Moderately well drained Helena soils, which are located in the lower positions or the more concave areas of the landscape
- Random areas of soils that have hard or soft bedrock at a depth of 40 to 60 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland

Cropland
Suitability: Unsuited

Management concerns:
- Erosion in unprotected areas
- Slope
- Surface stones

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Surface stones

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Pacolet—moderately high for loblolly pine; Saw—moderate for loblolly pine
Management concerns:
- Erosion in unprotected areas
- Limitations on equipment use
- Windthrow in areas of the Saw soil, which results from the limited rooting depth that is caused by the depth to bedrock

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Poorly suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Depth to bedrock in areas of the Saw soil
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 6e

PtF—Pacolet-Towaliga-Tussahaw complex, 10 to 35 percent slopes, cobbly

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes
Slope: Strongly sloping to steep
Slope shape: Mainly convex

Composition

Pacolet and similar soils—35 percent
Towaliga and similar soils—35 percent
Tussahaw and similar soils—25 percent
Dissimilar soils—5 percent

Typical Profile

Pacolet
Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—multicolored red, yellowish red, and pink sandy clay loam saprolite
54 to 60 inches—multicolored red, yellowish red, and very pale brown sandy loam saprolite

Towaliga
Surface layer:
0 to 3 inches—dark brown extremely gravelly loam

Subsurface layer:
3 to 11 inches—yellowish brown very gravelly loam

Subsoil:
11 to 33 inches—strong brown very gravelly sandy loam
33 to 48 inches—yellowish red clay
48 to 65 inches—yellowish red clay loam

Tussahaw
Surface layer:
0 to 3 inches—dark brown channery sandy loam

Subsoil:
3 to 9 inches—brown very channery sandy clay loam
9 to 20 inches—strong brown very channery sandy clay loam

Substratum:
20 to 27 inches—yellowish red very channery sandy clay loam

Bedrock:
27 to 41 inches—weathered sillimanite schist in shades of red and brown
41 inches—hard, fractured sillimanite schist

Soil Properties and Qualities

Depth class: Pacolet and Towaliga—very deep; Tussahaw—moderately deep
Drainage class: Well drained
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Permeability: Moderate
Available water capacity: Pacolet and Towaliga—moderate; Tussahaw—low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- Random areas of Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches
- Random areas of soils that have a loamy subsoil and have soft bedrock at a depth of 10 to 20 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope
- Depth to hard, fractured bedrock
- Stones in areas of the Tussahaw soil

Pasture and hayland
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Depth to hard, fractured bedrock
- Stones in areas of the Tussahaw soil

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Pacolet and Towaliga—moderately high for loblolly pine; Tussahaw—moderate for loblolly pine
Management concerns:
- Erosion in unprotected areas
- Moderately steep and steep slopes that limit the use of heavy equipment
- Windthrow in areas of the Tussahaw soil, which results from the limited rooting depth that is caused by the depth to hard, fractured bedrock

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Using a chisel or subsoiler increases the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Poorly suited or moderately suited

Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Depth to hard, fractured bedrock
- Stones in areas of the Tussahaw soil
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Poorly suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Gravel content in areas of the Towaliga soil
- Stones in areas of the Tussahaw soil

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: Pacolet and Towaliga—7e; Tussahaw—7s

PuE—Pacolet-Urban land complex, 10 to 25 percent slopes

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes
Slope: Strongly sloping and moderately steep
Slope shape: Convex

Composition

Pacolet and similar soils—60 percent
Urban land—20 percent
Dissimilar soils—20 percent

Typical Profile

Pacolet
Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—multicolored red, yellowish red, and pink sandy clay loam
54 to 60 inches—multicolored red, strong brown, and very pale brown sandy loam

Urban land

Urban land consists of areas that have been altered by cutting, filling, and shaping. Schools, parking lots, streets, commercial buildings, and residential dwellings are located in these areas.

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: Soils in this unit have been altered by cutting, filling, and shaping; schools, parking lots, streets, commercial buildings, and residential dwellings are features of the landscape.

Minor Components

Dissimilar
- Random areas of Saw soils, which have hard bedrock at a depth of 22 to 40 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Urban land

Cropland
Suitability: Unsuited
Management concerns:
- Limited size of areas

Pasture and hayland
Suitability: Unsuited
Management concerns:
- Limited size of areas

Woodland
Productivity class: None assigned
Management concerns:
- Limited size of areas

Urban development
Suitability: Poorly suited or moderately suited
Management concerns:
- Slope, which limits the use of this soil for building site development
- Moderate permeability in the subsoil, which may affect septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Poorly suited or moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: 8s

RoC—Rock outcrop

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping and sloping
Slope shape: Convex

Typical Profile

This map unit consists of exposed granite or granite gneiss rock that is hard.

Minor Components

Dissimilar
- Random areas of Ashlar and Wake soils

Land Use

Dominant uses: Wildlife and recreation

Cropland
Suitability: Unsuited

Pasture and hayland
Suitability: Unsuited

Woodland
Productivity class: None assigned

Urban development
Suitability: Unsuited

Recreational development
Suitability: Poorly suited
Management concerns:
- Slope
- Depth to bedrock

Interpretive Group

Land capability classification: 8s

ToA—Toccoa sandy loam, 0 to 2 percent slopes, frequently flooded

Setting

Landscape: Piedmont
Landform: Flood plains

Slope: Nearly level
Slope shape: Slightly concave and linear

Composition

Toccoa and similar soils—97 percent
Dissimilar soils—3 percent

Typical Profile

Surface layer:
0 to 4 inches—brown fine sandy loam

Underlying material:
4 to 22 inches—strong brown sandy loam
22 to 35 inches—yellowish red sandy loam
35 to 43 inches—yellowish red loamy sand
43 to 57 inches—yellowish red sandy loam
57 to 60 inches—strong brown loam that has brown iron depletions and dark yellowish brown masses of oxidized iron

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained and well drained
Seasonal high water table: Apparent, at a depth of 3.3 to 5.0 feet from December through April
Permeability: Moderately rapid
Available water capacity: Moderate
Flooding: Frequent
Natural fertility: Low
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: Bedding planes and thin strata of sandy or loamy texture occur throughout the C horizons

Minor Components

Dissimilar
- Excessively drained Buncombe soils, which are located on the adjacent stream levees

Land Use

Dominant uses: Woodland

Cropland
Suitability: Moderately suited
Management concerns:
- Seasonal wetness
- Flooding

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Pasture and hayland
Suitability: Well suited
Management concerns:
- Seasonal wetness
- Flooding

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Woodland
Productivity class: High for loblolly pine
Management concerns:
- No significant limitations

Urban development
Suitability: Unsuited
Management concerns:
- Seasonal wetness
- Flooding

Recreational development
Suitability: Poorly suited
Management concerns:
- Seasonal wetness
- Flooding

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Interpretive Group

Land capability classification: 3w

Ua—Urban land

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping and sloping
Slope shape: Convex

Typical Profile

Urban land consists of areas that have been altered by cutting, filling, and shaping. These areas are mostly covered by schools, commercial buildings, residential dwellings, parking lots, streets, and other impervious material so that identification of the natural soil is not feasible.

Extensive reclamation efforts are required to make areas suitable for use as cropland, pasture, hayland, and woodland. Onsite investigation is needed to determine the suitability of areas of this unit for each intended use.

Interpretive Group

Land capability classification: 8s

Ud—Udorthents

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Summits and backslopes
Slope: Gently sloping and sloping
Slope shape: Convex

Typical Profile

This map unit consists of areas that have been altered by cutting, filling, or shaping. In some areas, 2 to 8 feet of soil or soil material has been removed.

Land Use

Dominant uses: Borrow areas, landfills, and idle land

Cropland
Suitability: Unsuited
Management concerns:
- Highly disturbed soils and limited size of areas

Pasture and hayland
Suitability: Unsuited
Management concerns:
- Highly disturbed soils and limited size of areas

Woodland
Productivity class: None assigned
Management concerns:
- Highly disturbed soils and limited size of areas

Urban development
Suitability: Poorly suited
Management concerns:
- Highly disturbed soils and limited size of areas

Management measures and considerations:
- This map unit is difficult to manage for urban development because of areas of highly disturbed soils and the limited size of its areas.

Recreational development
Suitability: Poorly suited
Management concerns:
- Highly disturbed soils and limited size of areas

Management measures and considerations:
- This map unit is difficult to manage for recreational development because of areas of highly disturbed soils and the limited size of its areas.

Interpretive Group

Land capability classification: None assigned

W—Water

This map unit consists of areas of water, including ponds, lakes, and rivers. The largest mapped areas of water in, or partially in, Butts County are the Ocmulgee River, the South River, Chief McIntosh Lake, High Falls Lake, and Jackson Lake.

This map unit is not assigned a capability class.

WeA—Wehadkee loam, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: Piedmont
Landform: Flood plains

Slope: Nearly level
Slope shape: Slightly concave

Composition

Wehadkee and similar soils—85 percent
Dissimilar soils—15 percent

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown loam that has common fine prominent strong brown oxidized rhizospheres

Subsoil:
6 to 27 inches—grayish brown clay loam

Substratum:
27 to 45 inches—grayish brown loamy sand
45 to 55 inches—dark grayish brown sandy clay loam
55 to 60 inches—dark grayish brown loamy sand

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Seasonal high water table: Apparent, at a depth of 0 to 1.0 foot from November through May
Permeability: Moderate
Available water capacity: High
Flooding: Frequent
Natural fertility: Medium
Content of organic matter in the surface layer: Moderate
Tilth: Poor
Other distinctive properties: None

Minor Components

Dissimilar
- Somewhat poorly drained Chewacla soils, which are located in the higher positions on flood plains
- Random areas of soils that have a clayey subsoil or substratum

Land Use

Dominant uses: Wetland wildlife
Other uses: Woodland

Cropland
Suitability: Unsuited
Management concerns:
- Seasonal flooding

Pasture and hayland
Suitability: Unsuited
Management concerns:
- Seasonal flooding

Woodland
Productivity class: None assigned

Management concerns:
- Seasonal flooding limits the use of heavy equipment
- Seedling mortality is a concern because of seasonal flooding

Urban development
Suitability: Unsuited
Management concerns:
- Seasonal flooding

Recreational development
Suitability: Poorly suited
Management concerns:
- Seasonal flooding

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Interpretive Group

Land capability classification: 6w

WkA—Wehadkee loam, 0 to 1 percent slopes, frequently flooded, ponded

Setting

Landscape: Piedmont
Landform: Flood plains
Slope: Nearly level
Slope shape: Slightly concave and linear

Composition

Wehadkee and similar soils—80 percent
Dissimilar soils—20 percent

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown loam that has common fine prominent strong brown oxidized rhizospheres

Subsoil:
6 to 27 inches—grayish brown clay loam

Substratum:
27 to 45 inches—grayish brown loamy sand
45 to 55 inches—dark grayish brown sandy clay loam
55 to 60 inches—dark grayish brown loamy sand

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Very poorly drained
Seasonal high water table: Apparent, at a depth of 0 to 1.0 foot throughout the year
Permeability: Moderate
Available water capacity: High
Flooding: Frequent
Ponding frequency: Frequent

Ponding depth: 0 to 24 inches
Natural fertility: Medium
Content of organic matter in the surface layer: Moderate
Tilth: Poor
Other distinctive features: These areas are ponded primarily by beaver activity; most of these areas are open or sparsely wooded

Minor Components

Dissimilar
- Somewhat poorly drained Chewacla soils, which are located in the higher positions on flood plains
- Random areas of soils that have a clayey subsoil or substratum

Land Use

Dominant uses: Wetland wildlife
Other uses: Woodland

Cropland
Suitability: Unsuited
Management concerns:
- Seasonal flooding and ponding

Pasture and hayland
Suitability: Unsuited
Management concerns:
- Seasonal flooding and ponding

Woodland
Productivity class: None assigned
Management concerns:
- Seasonal wetness
- Flooding limits the use of heavy equipment
- Seedling mortality is a concern because of seasonal flooding and ponding

Urban development
Suitability: Unsuited
Management concerns:
- Seasonal flooding and ponding

Recreational development
Suitability: Poorly suited
Management concerns:
- Seasonal flooding and ponding

Management measures and considerations:
- Installing and maintaining an artificial drainage system reduce wetness.

Interpretive Group

Land capability classification: 8w

WyD—Wynott-Wilkes-Winnsboro complex, 6 to 15 percent slopes, stony

Setting

Landscape: Piedmont
Landform: Hills

Landform position: Shoulders and backslopes
Slope: Sloping and strongly sloping
Slope shape: Mainly convex

Composition

Wynott and similar soils—30 percent
Wilkes and similar soils—20 percent
Winnsboro and similar soils—15 percent
Dissimilar soils—35 percent

Typical Profile

Wynott
Surface layer:
0 to 5 inches—dark grayish brown sandy loam

Subsurface layer:
5 to 9 inches—brown sandy loam

Subsoil:
9 to 17 inches—dark yellowish brown clay
17 to 23 inches—dark yellowish brown sandy clay that has brown mottles

Substratum:
23 to 37 inches—multicolored yellowish brown, pale brown, and black sandy loam saprolite

Bedrock:
37 to 60 inches—multicolored greenish black, brown, and gray weathered rock

Wilkes
Surface layer:
0 to 3 inches—brown sandy loam

Subsurface layer:
3 to 6 inches—yellowish brown sandy loam

Subsoil:
6 to 10 inches—dark yellowish brown sandy clay loam
10 to 18 inches—dark yellowish brown sandy clay loam that has few fine prominent yellow and yellowish red mottles

Bedrock:
18 to 45 inches—multicolored greenish black, yellowish brown, and gray weathered rock
45 inches—hard bedrock

Winnsboro
Surface layer:
0 to 5 inches—very dark grayish brown sandy loam

Subsurface layer:
5 to 9 inches—dark yellowish brown sandy loam

Subsoil:
9 to 19 inches—strong brown clay
19 to 23 inches—dark yellowish brown clay that has common masses of manganese
23 to 42 inches—dark yellowish brown sandy clay loam that has mottles in shades of yellow and brown

Substratum:
42 to 50 inches—multicolored dark yellowish brown, very pale brown, brownish yellow, and dark grayish brown sandy clay loam
50 to 56 inches—multicolored dark yellowish brown, pale brown, and black sandy clay loam saprolite

Bedrock:
56 inches—greenish black, brown, and gray weathered rock

Soil Properties and Qualities

Depth class: Wilkes—shallow; Wynott—moderately deep; Winnsboro—deep
Drainage class: Well drained
Permeability: Wynott and Winnsboro—slow; Wilkes—moderately slow
Available water capacity: Wynott—moderate; Wilkes—very low; Winnsboro—high
Natural fertility: Medium
Shrink-swell potential: Wynott and Winnsboro—high; Wilkes—moderate
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- A few random areas of soils that have bedrock at a depth of more than 60 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Woodland

Cropland
Suitability: Wynott and Winnsboro soils—poorly suited; Wilkes—unsuited
Management concerns:
- Erosion in unprotected areas
- Slope
- Depth to soft bedrock in areas of the Wilkes and Wynott soils

Management measures and considerations:
- A conservation tillage system increases the content of organic matter, helps to maintain tilth, and reduces the hazard of erosion.

Pasture and hayland
Suitability: Moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Depth to soft bedrock in areas of the Wilkes and Wynott soils

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Windthrow in areas of the Wilkes and Wynott soils, which results from the limited rooting depth that is caused by the depth to soft bedrock

Management measures and considerations:
- Periodically harvesting windthrown trees that fell as a result of a limited rooting depth helps to maintain site productivity.

Urban development
Suitability: Poorly suited
Management concerns:
- Slope
- Depth to soft bedrock
- Shrink-swell potential, which limits the use of these soils for building site development
- Slow permeability in the subsoil, which limits the use of these soils for septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Limitations on building site development may be reduced by special design and construction.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Wynott and Winnsboro soils—moderately suited; Wilkes—poorly suited
Management concerns:
- Erosion in unprotected areas
- Depth to soft bedrock in areas of the Wilkes soils

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: Wynott and Winnsboro soils—4e; Wilkes—6e

WyE—Wynott-Wilkes-Winnsboro complex, 15 to 30 percent slopes, stony

Setting

Landscape: Piedmont
Landform: Hills
Landform position: Backslopes
Slope: Moderately steep and steep
Slope shape: Mainly convex

Composition

Wynott and similar soils—40 percent
Wilkes and similar soils—25 percent
Winnsboro and similar soils—15 percent
Dissimilar soils—20 percent

Typical Profile

Wynott
Surface layer:
0 to 5 inches—dark grayish brown sandy loam

Subsurface layer:
5 to 9 inches—brown sandy loam

Subsoil:
9 to 17 inches—dark yellowish brown clay
17 to 23 inches—dark yellowish brown sandy clay that has brown mottles

Substratum:
23 to 37 inches—multicolored yellowish brown, pale brown, and black sandy loam saprolite

Bedrock:
37 to 60 inches—multicolored greenish black, brown, and gray weathered rock

Wilkes
Surface layer:
0 to 3 inches—brown sandy loam

Subsurface layer:
3 to 6 inches—yellowish brown sandy loam

Subsoil:
6 to 10 inches—dark yellowish brown sandy clay loam
10 to 18 inches—dark yellowish brown sandy clay loam that has few fine prominent yellow and yellowish red mottles

Bedrock:
18 to 45 inches—multicolored greenish black, yellowish brown, and gray weathered rock
45 inches—hard bedrock

Winnsboro
Surface layer:
0 to 5 inches—very dark grayish brown and dark brown sandy loam

Subsurface layer:
5 to 9 inches—dark yellowish brown sandy loam

Subsoil:
9 to 19 inches—strong brown clay
19 to 23 inches—dark yellowish brown clay that has common masses of manganese
23 to 42 inches—dark yellowish brown sandy clay loam that has mottles in shades of yellow and brown

Substratum:
42 to 50 inches—multicolored dark yellowish brown, very pale brown, brownish yellow, and dark grayish brown sandy clay loam
50 to 56 inches—multicolored dark yellowish brown, pale brown, and black sandy clay loam saprolite

Bedrock:
56 inches—greenish black, brown, and gray weathered rock

Soil Properties and Qualities

Depth class: Wynott—moderately deep; Wilkes—shallow; Winnsboro—deep
Drainage class: Well drained
Permeability: Wynott and Winnsboro—slow; Wilkes—moderately slow
Available water capacity: Wynott—moderate; Wilkes—very low; Winnsboro—high
Shrink-swell potential: Wynott and Winnsboro—high; Wilkes—moderate
Natural fertility: Medium
Content of organic matter in the surface layer: Moderately low
Tilth: Good
Other distinctive properties: None

Minor Components

Dissimilar
- A few random areas of soils that have bedrock at a depth of more than 60 inches
- Alluvial soils that are located in the included drainages

Land Use

Dominant uses: Mainly woodland

Cropland
Suitability: Unsuited
Management concerns:
- Erosion in unprotected areas
- Slope
- Depth to soft bedrock in areas of the Wilkes and Wynott soils

Pasture and hayland
Suitability: Wynott and Wilkes soils—poorly suited; Winnsboro—moderately suited
Management concerns:
- Erosion in unprotected areas
- Slope
- Depth to soft bedrock in areas of the Wilkes and Wynott soils

Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland
Productivity class: Moderate for loblolly pine
Management concerns:
- Erosion in unprotected areas
- Moderately steep or steep slopes that limit the use of heavy equipment
- Windthrow in areas of the Wilkes and Wynott soils, which results from the limited rooting depth that is caused by the depth to soft bedrock

Management measures and considerations:
- Planting on the contour helps to minimize erosion.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails reduces the limitations on equipment use and helps to minimize erosion.

Urban development
Suitability: Poorly suited
Management concerns:
- Slope
- Depth to soft bedrock
- Shrink-swell potential limits the use of these soils for building site development
- Slow permeability in the subsoil limits the use of these soils for septic tank absorption fields
- Erosion in unprotected areas

Management measures and considerations:
- Soil limitations that affect septic systems may be reduced by special design and application of the septic system.
- Limitations on building site development may be reduced by special design and construction.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development
Suitability: Poorly suited

Management concerns:
- Erosion in unprotected areas
- Slope
- Depth to soft bedrock in areas of the Wilkes and Wynott soils

Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Group

Land capability classification: Wynott—7e; Wilkes—7s; Winnsboro—6e

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in Butts County. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate

gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

James E. Dean, conservation agronomist, and Holli Kuykendall, grassland water quality specialist, Natural Resources Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil. This section is useful to land users, equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Detailed Soil Map Units” and in the tables. Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Federal and State regulations require that any areas designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

In the survey area, soil erosion is a hazard on soils that have slopes of more than 3 percent. Loss of the surface layer through erosion is damaging. Soil productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a shallow surface layer or a clayey subsoil, or both, and on soils that have a layer in or below the subsoil that limits the depth of the root zone. Cecil, Lloyd, Madison, and Pacolet soils are examples of soils that have a clayey subsoil. Ashlar soils are an example of soils that have bedrock that limits the rooting depth.

Erosion on farmland results in the sedimentation of streams. Controlling erosion minimizes the pollution of water by runoff carrying plant nutrients, soil particles, and plant residue. It improves the quality of water for municipal use, for recreation, and for fish and wildlife.

Preparing a good seedbed is difficult in many sloping fields on clayey spots because much or all of the original friable surface soil has been lost through erosion. These eroded spots are common in areas of the eroded Cecil and Pacolet soils.

Erosion-control practices provide a protective surface cover, reduce runoff, and increase the rate of water infiltration. A cropping system that keeps a vegetative cover on the soil for extended periods helps to minimize soil loss and maintain the productive capacity of the soil. On livestock farms, including forage crops of legumes and grasses in the cropping system and in areas of permanent pasture and hayland helps to control erosion in sloping areas. The forage crops also add nitrogen to the soil and improve tilth.

In most areas of Cecil, Lloyd, Madison, and Pacolet soils that occur on hillsides and have slopes of more than 6 percent, contour farming and terracing are not practical because the slopes are too short and irregular. In these areas, cropping systems that provide a substantial cover of plant residue are needed to control erosion. Residue management, conservation tillage, cover crops, stripcropping, and the inclusion of

grasses and legumes in the rotation system provide ground cover on the soil surface and help to increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most of the soils in the survey area.

Terraces and diversions shorten the length of slopes and thus minimize erosion caused by runoff. They are most effective in areas of deep, well drained, gently sloping soils on ridgetops that are smooth and convex. Cecil and Lloyd soils are examples.

Most soils used for cropland are subject to erosion if they are plowed in fall and left bare until spring. Winter cover crops should be planted where cropland is plowed in fall.

Bottom land soils in the survey area include the Chewacla and Toccoa soils. The production of crops and pasture on these soils generally is not possible unless drainage practices are used. Existing drainage systems need to be continually maintained on these soils. Bottom land soils are also subject to flooding.

Information about erosion-control and drainage practices for each kind of soil is available at the local office of the Natural Resources Conservation Service. Drainage is a major consideration in managing crops and pasture.

Managing drainage in conformance with regulations concerning wetlands may require special permits and extra planning. The local office of the Natural Resources Conservation Service should be contacted for identification of hydric soils and potential wetlands.

Many soils in the uplands are strongly acid or very strongly acid in their natural state. Because available phosphorus and potash levels are naturally low in most of these soils, applying ground limestone to raise the pH level improves the growth of legumes and other crops.

Most of the upland soils are naturally low in fertility. On all of the soils, the amount of lime, fertilizer, and organic wastes to be applied should be based on the results of a soil test, realistic crop yields, waste analysis, and a nutrient management plan. The Cooperative Extension Service and the Natural Resources Conservation Service can provide information concerning nutrient management plans.

Organic matter is an important factor in the germination of seeds, root growth, the infiltration of water into the soil, and soil erosion. Soils that have good tilth are granular and porous. Most of the soils used for crops in the survey area have a surface layer of loamy sand that has a low content of organic matter. Generally, the structure of these soils is poor and intense rainfall causes the formation of a crust on the soil surface. This crust is hard when dry. It reduces infiltration and plant growth and increases runoff. Residue management, stripcropping, the inclusion of grasses and legumes in the rotation system, and regular additions of manure and other organic material in combination with conservation tillage help to improve soil structure and prevent the formation of a crust.

Crops commonly grown in the survey area are corn, soybeans, grain sorghum, and wheat. Some field crops, such as cotton, are suited to the soils and climate of the survey area but are not commonly grown. Specialty crops include sweet corn, tomatoes, and other vegetables.

Deep soils that are characterized by good natural drainage and that warm up early in spring are especially well suited to many vegetables and small fruits. These soils include Cecil, Lloyd, Madison, and Pacolet soils that have slopes of less than 6 percent.

Most of the well drained soils in the survey area are suitable to orchards and nursery plants. Soils in low landscape positions, where frost is frequent and air drainage is poor, generally are poorly suited to early vegetables, small fruits, orchard crops, and nursery plants.

If adequately managed and protected from flooding, many of the soils on flood plains are suited to a wide range of vegetable crops.

Technical assistance and the latest information about specialty crops can be obtained from the local office of the Cooperative Extension Service or the Natural Resources Conservation Service.

Pastures and hayland typically consist of mixtures of endophyte-infected tall fescue and common bermudagrass. This plant combination is well suited to the survey area because it provides forage for cool- and warm-season grazing. In areas managed by deferred grazing practices, native warm-season perennial grasses, such as eastern gamagrass, switchgrass, and indiangrass, can provide high-quality, palatable forage. Alfalfa can be grown as a specialty forage crop.

Irrigation is used in the production of orchard and specialty crops. The major source of water for irrigation is surface water from streams and ponds.

Yields per Acre

The titles of the tables described in this section are:

- "Nonirrigated Yields for Corn, Cotton Lint, and Grass Hay by Map Unit Component"
- "Nonirrigated Yields for Pasture, Soybeans, and Wheat by Map Unit Component"

The average yields per acre shown in the yields tables in this survey are those that can be expected of the principal crops under a high level of management. In any given year, yields may be higher or lower than those indicated in the tables because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the tables.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

Pasture yields are expressed in terms of animal unit months. An animal unit month (AUM) is the amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the yields tables are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that

would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forestland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, forestland, wildlife habitat, or recreation.

The capability classification of the soils in this survey area is given in the section “Detailed Soil Map Units” and in the yields tables.

Prime Farmland and Other Important Farmlands

The table “Prime Farmland and Other Important Farmlands” lists the map units in the survey area that are considered prime farmland and farmland of statewide importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation’s food supply.

Prime farmland is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government,

as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 19,655 acres in the survey area, or nearly 17 percent of the total land acreage, meets the soil requirements for prime farmland. Scattered areas of this land are throughout the county, but most are in the central and southwest parts, mainly in general soil map units 2 and 3, which are described under the heading "General Soil Map Units."

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

For some soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

In some areas, land that does not meet the criteria for prime farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

Forestland Productivity and Management

Josh A. Wheat, resource conservationist, Natural Resources Conservation Service, helped prepare this section.

Of the more than 119,600 acres in Butts County, almost 70 percent, or 83,300 acres is forestland. About 75,000 acres, or 90 percent of the forestland, is privately owned, and the remainder is owned by the forest industry and local governments (USDA, 1997).

The most significant forest types in Butts County include about 34,500 acres of oak-hickory and about 34,700 acres of natural stands of loblolly-shortleaf pine (USDA, 1997).

Virgin forest once covered most of the county. As settlement progressed in the area, however, the upland, well-drained soils were cleared for cultivation. The soils that

remained in forest consisted of soils that had slopes greater than 20 percent, the soils in flood plains and depressions, and the deep, excessively drained soils on ridges, uplands, and flood plains. Farming peaked in the early 1900's and the trend during the next several decades was away from cultivation and back toward forest and pasture. Since the early 1960's, the rural farm population has decreased significantly and has shifted toward an urban and non-farm rural population. Forested acres decreased by over 5,000 acres from 1989 to 1997 (USDA, 1997).

Over 67 percent of the forestland in Butts County is considered to be fully or moderately stocked, and the remainder of the forestland is considered to be poorly stocked. Only about 28 percent of the forestland is considered to be even moderately productive, capable of producing, under average management, about 1 to 1.5 cords per acre per year (USDA, 1997). Much of the remaining acreage generally produces less than a cord per acre. Production on much of the existing forestland could be improved by thinning out mature trees and undesirable species. Protection from excessive grazing, fire, disease, and insects also could improve the stands. The Natural Resources Conservation Service, the Georgia Forestry Commission, or the Cooperative Extension Service can provide additional information about forestland productivity and management in the survey area.

The tables described in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forestland management.

Forestland Productivity

In the table, "Forestland Productivity," the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Forestland Management

The titles of the tables described in this section are:

- "Log Landings, Hazard of Erosion, and Suitability for Roads on Forestland"
- "Forestland Planting and Harvesting"

In these tables, interpretive ratings are given for various aspects of forestland management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified aspect of forestland management. *Well suited* indicates that the soil has features that are favorable for the specified management aspect and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately

favorable for the specified management aspect. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified management aspect. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified management aspect or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The ratings of *suitability for log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited to use as log landings.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for use of harvesting equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately suited, or poorly suited to this use.

Recreational Development

The titles of the tables described in this section are:

- "Camp Areas and Picnic Areas"
- "Playgrounds, Paths, and Trails"

In the tables described in this section, the soils of the survey area are rated according to limitations that affect their suitability for recreational development. The ratings are both verbal and numerical. Rating class terms indicate the extent to which

the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in these tables can be supplemented by other information in this survey, for example, interpretations for dwellings without basements, for local roads and streets, and for septic tank absorption fields.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of

vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Wildlife Habitat

Soils affect the kind, amount, and vigor of vegetation available to wildlife as food and cover. The soils of Butts County support a diversity of habitat that can sustain many wildlife species. Knowledge of soil types and the associated plant communities they support is valuable in managing wildlife. Generally, wildlife occupies areas that are the most suitable for their food, water, and cover requirements. Understanding soil-vegetation relationships is important in creating and maintaining productive areas of wildlife habitat. Soil surveys can be used in management programs, such as habitat improvement, species reintroduction, and creation of wildlife refuges. A variety of habitat for a diversity of wildlife is an important objective in wildlife management. The habitat needs of wildlife should be considered in all decisions involving land use and management. Fish and wildlife are important in the county because they provide opportunities for recreation and are resources that improve the local economy.

About 70 percent of the acreage in Butts County is forested and nearly 8 percent is used for row crops and pasture. Some of the forests are hardwood, some are pine, and some are mixed pine and hardwoods. The cropland and woodland provide good or fair habitat for wildlife.

Cropland and pasture are interspersed with pine and hardwood forests in the survey area. Very deep, well drained upland soils, such as the Cecil, Lloyd, and Pacolet soils, are important soils for cropland and pasture. These soils support many native and domestic plants that are important to terrestrial wildlife. Abandoned pastures, old fields, and field borders support numerous woody and herbaceous plants that provide food and cover for white-tailed deer, turkey, rabbit, fox, bob-white quail, songbirds, and other wildlife species. The major native plants of importance to wildlife include greenbrier, lespedezas, croton, ragweed, partridgepea, clover, and sumac. Domestic plants of importance to wildlife include corn, soybeans, fescue, and small grains.

Pacolet, Madison, Cecil, and Lloyd soils are important soils for wildlife habitat on uplands. These soils support vegetation that provides habitat for white-tailed deer, turkey, raccoon, gray squirrel, opossum, fox, and other wildlife. The important overstory and understory woodland plant types are sweetgum, blackgum, dogwood, oak, hickory, holly, blackberry, and maple. Young pine plantations and thinned stands of hardwoods are important areas that support numerous woody and herbaceous plants, which provide food and cover for wildlife.

In the bottom lands, large stands of mixed hardwoods, including white oak, hickory, red maple, and tulip poplar, grow well on the Chewacla and Toccoa soils, which account for about 8,390 acres, or 6.9 percent, of Butts County. These areas support species such as gray squirrel, turkey, white-tailed deer, raccoon, beaver, and ducks. Wetland areas on the Wehadkee soils provide important habitat for waterfowl and a variety of furbearers, including otter, beaver, muskrat, and raccoon. Blackgum, green ash, alder, and a variety of herbaceous plants are among the important plants for

wildlife in these areas. Wehadkee soils occur on about 1,900 acres, or about 1.6 percent, of the county.

Rock outcrops and the associated Ashlar and Wake soils comprise about 350 acres, or 0.3 percent, of Butts County. Although relatively small in acreage, these areas provide a specialized habitat for some plant and animal species. Red cedar is an important tree for wildlife found in these areas.

Wildlife habitat can be improved and enhanced by restoring hedgerows, field borders, windbreaks, and stream buffers. The ability of pine plantations to support wildlife can be improved by retaining mast-producing trees, such as oak, wherever possible.

Butts County has many small ponds and several miles of streams. Because of the fragile habitat requirements of fish, special efforts are needed to restrict both point and non-point sources of water pollution in the county. Good soil management practices for all types of land use are a primary consideration for controlling pollution in streams.

Soil types affect the kind and amount of vegetation that is available to wildlife as food and cover. The kind and abundance of wildlife depend largely on the amount and distribution of food and cover. Wildlife habitat can be improved by promoting the establishment of desirable plants and by diversifying and enhancing the existing plant cover.

Hydric Soils

This section lists the map units that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” (Soil Survey Staff, 1999) and “Keys to Soil Taxonomy” (Soil Survey Staff, 2006) and in the “Soil Survey Manual” (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 2002).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The following map units meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

WeA Wehadkee loam, 0 to 1 percent slopes, frequently flooded
WkA Wehadkee loam, 0 to 1 percent slopes, frequently flooded, ponded

Map units that dominantly are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The following map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

CwA Chewacla loam, 0 to 2 percent slopes, frequently flooded
ToA Toccoa sandy loam, 0 to 2 percent slopes, frequently flooded

The criteria for hydric soils are represented by codes (for example, 2B3). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   B. are poorly drained or very poorly drained and have either:
      1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
      2) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
      3) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most

limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for septic tank absorption fields and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of sand, roadfill, and topsoil; plan structures for water management; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

The titles of the tables described in this section are:

- "Dwellings"
- "Roads and Streets and Shallow Excavations"

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The tables described in this section show the degree and kind of soil limitations that affect dwellings with and without basements, local roads and streets, and shallow excavations.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building

site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock, hardness of bedrock, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock, hardness of bedrock, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock, hardness of bedrock, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Sanitary Facilities

The table “Sewage Disposal” shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features

that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock, and flooding affect absorption of the effluent. Stones and boulders and bedrock interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock to make land smoothing practical.

Construction Materials

The table “Source of Sand, Roadfill, and Topsoil” gives information about the soils as potential sources of sand, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand is a natural aggregate suitable for commercial use with a minimum of processing. It is used in many kinds of construction. Specifications for each use vary widely. In the table, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil

as a source of sand are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand, the soil is considered a likely source regardless of thickness. The assumption is that the sand layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The rating class terms are *good, fair,* and *poor* for sources of roadfill and topsoil. The features that limit the soils as sources of roadfill and topsoil are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of roadfill and topsoil. The lower the number, the greater the limitation.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, or depth to bedrock.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

The table “Ponds and Embankments” gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be

overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders. A high water table affects the amount of usable material. It also affects trafficability.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine selected physical and chemical properties.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering soil properties, physical and chemical properties, and pertinent soil and water features.

Engineering Soil Properties

The table described in this section gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group

index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical and Chemical Soil Properties

The table described in this section shows estimates of some physical and chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an

important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Water Features

The table described in this section gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or redoximorphic features in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of

flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

The table described in this section gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. An examples is bedrock. The table indicates the hardness and the depth to top of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2006). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, thermic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

The table "Taxonomic Classification of the Soils" indicates the order, suborder, great group, subgroup, and family of the soil series in the survey area.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each

series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993) and in the "Field Book for Describing and Sampling Soils" (Schoeneberger and others, 2002). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 2006). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Typical pedons described in this survey may be located in an adjoining county. These soils, even though outside the survey area, are on similar landforms and exhibit very similar horizon thickness and properties. These differences do not significantly affect the use and management of the soils.

Ashlar Series

Depth class: Moderately deep
Agricultural drainage class: Excessively drained
Permeability: Moderately rapid
Parent material: Residuum weathered from granite and granite gneiss
Landscape: Piedmont
Landform: Hills
Slope range: 2 to 25 percent
Taxonomic classification: Coarse-loamy, mixed, semiactive, thermic Typic Dystrudepts

Geographically Associated Soils

- Pacolet and Saw soils, which have a fine particle-size control section

Typical Pedon

Jasper County, Georgia; 4.5 miles southwest of Georgia Highway 11 at the Newton County line on county road, 100 feet west of road; USGS topographic quadrangle, Stewart, GA (1964); lat. 33 degrees 25 minutes 27 seconds N. and long. 83 degrees 48 minutes 51 seconds W.

A—0 to 7 inches; yellowish brown (10YR 5/4) coarse sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.
Bw—7 to 15 inches; brownish yellow (10YR 6/6) coarse sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary.
C—15 to 25 inches; brownish yellow (10YR 6/6) loamy coarse sand; single grained; very friable; few medium and large roots; very strongly acid; clear wavy boundary.
R—25 inches; hard granite gneiss.

Range in Characteristics

Thickness of the solum: 15 to 29 inches
Depth to hard bedrock: 23 to 40 inches
Content of coarse fragments: 0 to 15 percent
Reaction: Very strongly acid or strongly acid

A horizon:
Thickness—4 to 7 inches
Color—hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4
Texture—coarse sandy loam or sandy loam

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8
Texture—sandy loam or coarse sandy loam
Mottles—pink mottles occur in the lower part of some pedons

C horizon:
Color—brownish yellow or multicolored in shades of yellow, brown, and white
Texture—loamy coarse sand or coarse sandy loam

R layer:
Type of bedrock—unweathered igneous or high-grade metamorphic rock

Bethlehem Series

Depth class: Moderately deep
Agricultural drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from mica schist or mica gneiss
Landscape: Piedmont
Landform: Hills
Slope range: 6 to 30 percent
Taxonomic classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Madison and Pacolet soils, which have a thicker solum than the Bethlehem soil

Typical Pedon

Butts County, Georgia; 0.5 mile south of Jackson on Georgia Highway 36 to Brownlee Road, 2.3 miles south to Lake Clark Road, 0.75 mile east, 400 feet north; USGS topographic quadrangle, Jackson, GA (1964); lat. 33 degrees 15 minutes 18 seconds N. and long. 83 degrees 57 minutes 14 seconds W.

A—0 to 8 inches; dark yellowish brown (10YR 4/4) gravelly sandy loam; weak fine granular structure; very friable; many fine and common medium roots; 17 percent gravel; few fine flakes of mica; strongly acid; clear smooth boundary.

BA—8 to 12 inches; yellowish red (5YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable; may fine roots; 3 percent gravel; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt1—12 to 21 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm; common fine and few medium roots; common distinct clay films on faces of peds; common fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt2—21 to 33 inches; red (2.5YR 4/8) sandy clay; weak medium subangular blocky structure; firm; few fine roots; few faint clay films on faces of peds; common or many fine flakes of mica; very strongly acid; gradual wavy boundary.

C—33 to 38 inches; multicolored red (2.5YR 4/8), reddish yellow (7.5YR 6/8), and yellow (10YR 7/6) saprolite that crushes to gravelly sandy loam; massive; friable; 15 percent gravel and cobbles; many fine flakes of mica; very strongly acid; gradual wavy boundary.

Cr—38 inches; multicolored, weathered mica schist in shades of red and brown

Range in Characteristics

Thickness of the solum: 20 to 40 inches

Depth to soft bedrock: 20 to 40 inches
Content of coarse fragments: 0 to 40 percent gravel or cobbles in the A horizon; 0 to 35 percent gravel or cobbles in the E, BA, BE, and Bt horizons; 15 to 40 percent gravel or cobbles in the BC and C horizons
Reaction: Very strongly acid or strongly acid
Content of flakes of mica: Few or common in the upper horizons; common or many in the lower part of the solum

A horizon:
Thickness—4 to 8 inches
Color—hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 3 or 4
Texture (fine-earth fraction)—sandy loam

BA horizon:
Color—hue of 5YR to 10YR, value of 4 or 5, and chroma of 6 or 8
Texture (fine-earth fraction)—sandy clay loam, clay loam, or loam

Bt horizon:
Color—hue of 2.5YR or 5YR, value of 4, and chroma of 6 or 8
Texture—sandy clay, clay loam, or clay

BC horizon (where present):
Color—hue of 2.5YR or 5YR, value of 4, and chroma of 6
Texture—sandy clay loam or clay loam
Mottles—in shades of yellow, brown, and red

C horizon (where present):
Color—multicolored in shades of yellow, brown, and red
Texture (fine-earth fraction)—saprolite that crushes to sandy loam

Cr horizon:
Type of bedrock—weathered high-grade metamorphic rock

Buncombe Series

Depth class: Very deep
Agricultural drainage class: Excessively drained (fig. 7)
Permeability: Rapid
Parent material: Sandy alluvium
Landscape: Piedmont
Landform: Stream levees
Slope range: 0 to 6 percent
Taxonomic classification: Mixed, thermic Typic Udipsamments

Geographically Associated Soils

- Chewacla soils, which have a fine-loamy particle-size control section and are somewhat poorly drained
- Toccoa soils, which have a coarse-loamy particle-size control section and are well drained or moderately well drained

Typical Pedon

Jasper County, Georgia; 0.2 mile north of Georgia Highway 16 on Old State Route 221, about 100 feet west of road; USGS topographic quadrangle, Lloyd Shoals Dam, GA (1964); lat. 33 degrees 18 minutes 22 seconds N. and long. 83 degrees 50 minutes 12 seconds W.

Figure 7.—Profile of Buncombe loamy sand. This excessively drained soil occurs on natural levees on flood plains.

A—0 to 10 inches; dark yellowish brown (10YR 4/4) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

C1—10 to 35 inches; yellowish brown (10YR 5/4) sand; single grained; loose; few very fine flakes of mica; few fine and medium roots; very strongly acid; gradual wavy boundary.

C2—35 to 55 inches; yellowish brown (10YR 5/4) sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; few very fine flakes of mica; very strongly acid; gradual wavy boundary.

C3—55 to 60 inches; dark yellowish brown (10YR 4/4) loamy sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; very friable; very strongly acid.

Range in Characteristics

Thickness of the sand: 40 to more than 60 inches
Reaction: Very strongly acid or strongly acid

A horizon:
Thickness—6 to 10 inches
Color—hue of 10YR, value of 3 to 5, and chroma of 3 or 4
Texture—loamy sand or sand

C horizon (upper part):
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8
Texture—sand or loamy sand
Mottles—in shades of brown and yellow

C horizon (lower part):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8
Texture—sand or loamy sand
Mottles—in shades of brown and yellow

Cataula Series

Depth class: Very deep
Agricultural drainage class: Moderately well drained
Permeability: Slow
Parent material: Residuum weathered from felsic crystalline rock
Seasonal high water table: Perched, at a depth of 2.5 to 3.3 feet from December through April
Landscape: Piedmont
Landform: Hills
Slope range: 2 to 6 percent
Taxonomic classification: Fine, kaolinitic, thermic Oxyaquic Kanhapludults

Geographically Associated Soils

- Cecil soils, which do not have a seasonal high water table within a depth of 6 feet
- Hard Labor soils, which have a brown subsoil

Typical Pedon

Butts County, Georgia; 1.5 miles east of Jackson on Georgia Highway 16 to Halls Bridge Road, 1.3 miles east to Jones Road, 3,000 feet north to cross fence, 1,000 feet west; USGS topographic quadrangle, Jackson, GA (1985); lat. 33 degrees 18 minutes 3 seconds N. and long. 83 degrees 55 minute 29 seconds W.

Ap—0 to 4 inches; dark yellowish brown (10YR 3/4) sandy loam; weak fine granular structure; very friable; many fine and very fine roots; strongly acid; abrupt smooth boundary.

EB—4 to 7 inches; yellowish brown (10YR 5/6) sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

Bt1—7 to 23 inches; red (2.5YR 4/6) clay; weak medium subangular blocky structure; firm; common fine roots; few continuous clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—23 to 30 inches; red (2.5YR 4/6) clay; weak medium subangular blocky and weak medium platy structure; firm; common fine roots; common medium prominent pale brown (10YR 6/3) iron depletions; common medium prominent brownish yellow (10YR 6/8) masses of oxidized iron; common continuous clay films on faces of peds; strongly acid; gradual wavy boundary.

Btx—30 to 40 inches; red (2.5YR 4/6) clay; moderate medium platy structure; firm; common medium prominent light brownish gray (10YR 6/2) and pale brown (10YR 6/3) iron depletions; many medium prominent brownish yellow (10YR 6/8) masses of oxidized iron in horizontal layers; dense and brittle in 10 percent of the red and brownish yellow areas; many continuous clay films on horizontal faces of peds; strongly acid; gradual smooth boundary.

BC—40 to 52 inches; red (2.5YR 4/6) and brownish yellow (10YR 6/8) sandy clay; weak medium subangular blocky structure; firm; light brownish gray (10YR 6/2) iron depletions; strongly acid; gradual smooth boundary.

C—52 to 60 inches; red (2.5YR 4/8) sandy clay loam; massive; firm; strongly acid.

Range in Characteristics

Thickness of the solum: 40 to more than 60 inches
Depth to iron depletions with chroma of 2 or less: 24 to 48 inches
Reaction: Very strongly acid or strongly acid, except where lime has been applied

A or Ap horizon:
Thickness—4 to 9 inches
Color—hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 4
Texture—sandy loam

Bt horizon:
Color—hue of 2.5YR, value of 4, and chroma of 6 or 8
Texture—sandy clay or clay
Redoximorphic features—iron depletions in shades of brown and masses of oxidized iron in shades of yellow and brown in some pedons

Btx horizon:
Color—hue of 2.5YR, value of 4, and chroma of 6 or 8; or multicolored in shades of yellow, gray, and brown
Texture—sandy clay or clay
Redoximorphic features—iron depletions in shades of gray and brown and masses of oxidized iron in shades of yellow and brown

BC horizon:
Color—multicolored in shades of red, brown, and yellow
Texture—sandy clay, sandy clay loam, or clay loam
Redoximorphic features—iron depletions in shades of gray and masses of oxidized iron in shades of yellow and brown in some pedons

C horizon (where present):
Color—hue of 2.5YR, value of 4, and chroma of 8; or multicolored in shades of red, brown, and yellow
Texture—sandy loam or sandy clay loam

Cecil Series

Depth class: Very deep
Agricultural drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from felsic crystalline rock
Landscape: Piedmont
Landform: Hills
Slope range: 2 to 10 percent
Taxonomic classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Cataula soils, which have a seasonal high water table
- Lloyd soils, which have a dark red or red subsoil
- Pacolet soils, which have a thinner solum than the Cecil soil

Typical Pedon

Jasper County, Georgia; 700 feet northeast of intersection of Georgia Highways 83 and 142 at Shady Dale, 500 feet northwest of Highway 83; USGS topographic quadrangle, Shady Dale, GA (1972); lat. 33 degrees 24 minutes 10 seconds N. and long. 83 degrees 35 minutes 13 seconds W.

A—0 to 8 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

BA—8 to 11 inches; reddish brown (5YR 5/4) sandy clay loam; weak fine subangular blocky structure; friable; common fine roots; very strongly acid; clear smooth boundary.

Bt1—11 to 24 inches; red (2.5YR 4/6) sandy clay; moderate medium subangular blocky structure; firm; few medium roots; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—24 to 37 inches; red (2.5YR 4/6) sandy clay; common medium distinct reddish yellow (7.5YR 6/6) mottles; weak medium subangular blocky structure; firm; common distinct clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—37 to 48 inches; red (2.5YR 4/8) sandy clay loam; common medium prominent reddish yellow (7.5YR 7/6) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C—48 to 60 inches; multicolored red (2.5YR 4/8) and reddish yellow (7.5YR 7/6) saprolite that crushes to sandy clay loam; massive; friable; few fine flakes of mica; very strongly acid.

Range in Characteristics

Thickness of the solum: 43 to more than 60 inches (fig. 8)
Reaction: Very strongly acid or strongly acid, except where lime has been applied

Figure 8.—Profile of Cecil sandy loam. This well drained soil has a red subsoil that extends to a depth of 60 inches or more.

A horizon:
Thickness—4 to 8 inches
Color—hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 3 to 6
Texture—sandy loam or sandy clay loam

BA horizon (where present):
Color—2.5YR to 7.5YR, value of 4 or 5, and chroma of 4
Texture—sandy clay loam or clay loam

Bt horizon (upper part):
Color—hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 or 8
Texture—sandy clay or clay

Bt horizon (lower part):
Color—hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8
Texture—sandy clay or clay
Mottles—in shades of red, brown, and yellow

BC horizon (where present):
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8
Texture—sandy clay loam
Mottles—in shades of yellow and brown

C horizon:
Color—multicolored in shades of red, brown, and yellow
Texture—saprolite that crushes to sandy loam or sandy clay loam

Chewacla Series

Depth class: Very deep
Agricultural drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Loamy alluvium
Seasonal high water table: Apparent, at a depth of 0.5 to 2.0 feet from December through April
Landscape: Piedmont
Landform: Flood plains
Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, mixed, active, thermic Fluvaquentic Dystrudepts

Geographically Associated Soils

- Toccoa soils, which have a coarse-loamy particle-size control section and are well drained or moderately well drained
- Wehadkee soils, which are poorly drained

Typical Pedon

Butts County, Georgia; 2,000 feet northeast of bridge at Watson Creek and Georgia Highway 42; USGS topographic quadrangle, Jackson, GA (1985); lat. 33 degrees 18 minutes 27 seconds N. and long. 83 degrees 58 minutes 28 seconds W.

A—0 to 6 inches; dark brown (7.5YR 3/3) loam; weak fine granular structure; very friable; many fine roots; common fine flakes of mica; strongly acid; clear smooth boundary.

Bw1—6 to 14 inches; brown (7.5YR 4/4) clay loam; weak fine subangular blocky

structure; friable; common fine roots; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bw2—14 to 25 inches; brown (7.5YR 4/3) clay loam; weak fine subangular blocky structure; friable; few fine roots; common medium faint brown (7.5YR 5/2) iron depletions; common fine flakes of mica; strongly acid; clear wavy boundary.

Bg—25 to 30 inches; very dark grayish brown (10YR 3/2) clay loam; weak medium subangular blocky structure; friable; few fine roots; many fine prominent yellowish red (5YR 5/6) masses of oxidized iron; strongly acid; clear wavy boundary.

BCg—30 to 40 inches; very dark gray (N3/) sandy clay loam; massive; very friable; strongly acid; clear wavy boundary.

Cg—40 to 60 inches; gray (10YR 5/1) sandy clay loam that has pockets of sandy clay material; massive; friable; strongly acid.

Range in Characteristics

Thickness of the solum: 22 to 48 inches
Depth to iron depletions with chroma of 2 or less: 6 to 24 inches
Reaction: Very strongly acid to slightly acid

A horizon:
Thickness—4 to 8 inches
Color—hue of 5YR to 10YR, value of 3 or 4, and chroma of 2 to 4
Texture—sandy loam, loam, silt loam, or clay loam

Bw horizon:
Color—hue of 5YR to 10YR, value of 4, and chroma of 3 to 6
Texture—sandy clay loam, loam, silty clay loam, or clay loam
Redoximorphic features—iron depletions in shades of brown and gray and masses of oxidized iron in shades of brown

Bg horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2
Texture—sandy clay loam, loam, or clay loam
Redoximorphic features—masses of oxidized iron in shades of brown

BC horizon (where present):
Color—multicolored in shades of gray and brown
Texture—fine sandy loam, sandy clay loam, or loam
Redoximorphic features—iron depletions in shades of brown and gray and masses of oxidized iron in shades of brown

BCg horizon (where present):
Color—neutral in hue or hue of 10YR; value of 4 and chroma of 0 to 2
Texture—sandy clay loam or clay loam
Redoximorphic features—iron depletions in shades of brown and gray and masses of oxidized iron in shades of brown

Cg horizon:
Color—neutral in hue or hue of 7.5YR to 2.5Y; value of 4 to 7 and chroma of 0 to 2
Texture—loamy sand, sandy loam, sandy clay loam, silty clay loam, sandy clay, silty clay, or clay
Redoximorphic features—iron depletions in shades of brown and gray and masses of oxidized iron in shades of brown

Hard Labor Series

Depth class: Very deep
Agricultural drainage class: Moderately well drained
Permeability: Slow
Parent material: Residuum weathered from felsic crystalline rock
Seasonal high water table: Perched, at a depth of 2.5 to 3.3 feet from December through April (fig. 9)
Landscape: Piedmont
Landform: Hills
Slope range: 2 to 6 percent
Taxonomic classification: Fine, kaolinitic, thermic Oxyaquic Kanhapludults

Geographically Associated Soils

- Cataula soils, which have a red subsoil
- Cecil and Pacolet soils, which have a red subsoil and do not have a seasonal high water table within 6 feet
- Helena soils, which have mixed mineralogy and have a seasonal high water table closer to the soil surface than the Hard Labor soil

Typical Pedon

Butts County, Georgia; 2.8 miles north of Jackson on Georgia Highway 36 to Old Bethel Road, 1,000 feet southwest into open field; USGS topographic quadrangle, Jackson, GA (1985); lat. 33 degrees 19 minutes 55 seconds N. and long. 83 degrees 58 minutes 1 second W.

Ap—0 to 9 inches; dark brown (10YR 3/3) sandy loam; weak medium granular structure; very friable; many fine and few medium roots; strongly acid; clear smooth boundary.

BE—9 to 15 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium granular structure; friable; common fine roots; strongly acid; clear smooth boundary.

Bt1—15 to 26 inches; yellowish brown (10YR 5/8) sandy clay; weak medium subangular blocky structure; firm; few fine roots; strongly acid; gradual wavy boundary.

Bt2—26 to 36 inches; yellowish brown (10YR 5/6) clay; weak medium subangular blocky structure; firm; common medium prominent red (2.5YR 4/6) masses of oxidized iron; strongly acid; gradual wavy boundary.

Bt3—36 to 50 inches; 35 percent yellowish brown (10YR 5/6) and 35 percent red (2.5YR 4/6) sandy clay; moderate medium platy structure; firm; 30 percent light brownish gray (10YR 6/2) iron depletions; strongly acid; gradual wavy boundary.

BC—50 to 60 inches; 40 percent yellowish brown (10YR 5/8) and 40 percent red (2.5YR 4/6) sandy clay; moderate medium platy structure; firm; 20 percent very pale brown (10YR 7/3) iron depletions; strongly acid.

Range in Characteristics

Thickness of the solum: 40 to more than 60 inches
Depth to iron depletions with chroma of 2 or less: 30 to 40 inches
Reaction: Very strongly acid or strongly acid, except where lime has been applied

A or Ap horizon:
Thickness—3 to 9 inches

Figure 9.—Profile of Hard Labor sandy loam. A perched seasonal high water table occurs at a depth of about 3 feet in this pedon.

Color—hue of 10YR, value of 3 or 4, and chroma of 3 or 4
Texture—sandy loam or sandy clay loam

E horizon (where present):
Color—hue of 10YR, value of 4 to 6, and chroma of 4
Texture—sandy loam

BE horizon (where present):
Color—hue of 10YR, value of 5, and chroma of 4
Texture—sandy loam or sandy clay loam

Bt horizon (upper part):
Color—hue of 5YR to 10YR, value of 4 to 6, and chroma of 6 or 8
Texture—sandy clay or clay
Redoximorphic features—masses of oxidized iron in shades of brown in some pedons

Bt horizon (lower part):
Color—hue of 5YR to 10YR, value of 4 or 5, and chroma of 6 or 8
Texture—sandy clay or clay
Redoximorphic features—iron depletions in shades of brown and gray and masses of oxidized irons in shades of red and brown

BC horizon:
Color—multicolored in shades of red, brown, and yellow
Texture—sandy clay loam or sandy clay
Redoximorphic features—iron depletions in shades of brown and gray and masses of oxidized irons in shades of brown

C horizon (where present):
Color—multicolored in shades of red, brown, and yellow
Texture—loamy saprolite
Redoximorphic features—iron depletions in shades of brown and gray and masses of oxidized irons in shades of brown

Helena Series

Depth class: Very deep
Agricultural drainage class: Moderately well drained
Permeability: Slow
Parent material: Residuum weathered from a mixture of felsic and intermediate crystalline rock
Seasonal high water table: Perched, at a depth of 1.5 to 2.5 feet from December through April
Landscape: Piedmont
Landform: Hills
Slope range: 2 to 10 percent
Taxonomic classification: Fine, mixed, semiactive, thermic Aquic Hapludults

Geographically Associated Soils

- Cataula and Hard Labor soils, which have a perched water table between 2.5 and 3.3 feet
- Cecil soils, which do not have a seasonal high water table within 6.0 feet

Typical Pedon

Butts County, Georgia; 3.0 miles east of the Ocmulgee River on Georgia Highway 16 to Dave Bailey Road, 1.5 miles southeast to intersection with Dotson Road, 4,000 feet

north; USGS topographic quadrangle, Lloyd Shoals Dam, GA (1964); lat. 33 degrees 16 minutes 43 seconds N. and long. 83 degrees 51 minutes 51 seconds W.

Ap—0 to 8 inches; dark yellowish brown (10YR 3/4) sandy loam; weak fine granular structure; very friable; many very fine and common medium roots; strongly acid; clear smooth boundary.

E—8 to 11 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; common very fine roots; strongly acid; clear smooth boundary.

Bt1—11 to 20 inches; yellowish brown (10YR 5/6) sandy clay; moderate medium subangular blocky structure; very firm; sticky and plastic; few fine roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—20 to 30 inches; yellowish brown (10YR 5/8) sandy clay; moderate medium subangular blocky structure; very firm; sticky and plastic; many medium distinct light brownish gray (10YR 6/2) iron depletions; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg—30 to 35 inches; light gray (10YR7/1) sandy clay; weak medium angular blocky structure; firm; sticky and plastic; many medium prominent yellowish brown (10YR 5/8) masses of oxidized iron; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

BCg—35 to 45 inches; light gray (10YR 7/1) sandy clay loam; massive; firm; common medium prominent yellowish brown (10YR 5/8) masses of oxidized iron; very strongly acid; gradual wavy boundary.

Cg—45 to 60 inches; light gray (10YR 7/1) sandy loam; massive; firm; common medium prominent yellow (10YR 7/8) and few medium prominent yellowish red (5YR 5/8) masses of oxidized iron; very strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 55 inches
Depth to iron depletions with chroma of 2 or less: 18 to 30 inches
Reaction: Very strongly acid or strongly acid, except where lime has been applied

A or Ap horizon:
- Thickness—4 to 10 inches
- Color—hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 4
- Texture—sandy loam

E horizon (where present):
- Color—hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4
- Texture—sandy loam

Bt horizon (upper part):
- Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8
- Texture—sandy clay or clay
- Redoximorphic features—iron depletions in shades of brown and masses of oxidized iron in shades of red, brown, and yellow

Bt horizon (lower part):
- Color—hue of 5YR to 2.5Y, value of 5 to 7, and chroma of 4 to 8; or multicolored in shades of red, brown, yellow, and gray
- Texture—sandy clay or clay
- Redoximorphic features—iron depletions in shades of gray and brown and masses of oxidized iron in shades of red, brown, and yellow

Btg horizon (where present):
Color—hue of 10YR, value of 7, and chroma of 1 or 2
Texture—sandy clay or clay
Redoximorphic features—masses of oxidized iron in shades of red, brown, and yellow

BC or BCg horizon (where present):
Color—hue of 5YR to 10YR, value of 5 to 7, and chroma of 1 to 8; or multicolored in shades of red, brown, yellow, and gray
Texture—sandy clay loam or clay loam
Redoximorphic features—iron depletions in shades of brown and gray and masses of oxidized iron in shades of red and brown

C or Cg horizon (where present):
Color—hue of 10YR, value of 7, and chroma of 1; or multicolored in shades of red, brown, yellow, and gray
Texture—saprolite that crushes to sandy loam, loam, or sandy clay loam
Redoximorphic features—iron depletions in shades of gray and brown and masses of oxidized iron in shades of red, brown, and yellow

Lloyd Series

Depth class: Very deep
Agricultural drainage class: Well drained (fig. 10)
Permeability: Moderate
Parent material: Residuum weathered from hornblende gneiss
Landscape: Piedmont
Landform: Hills
Slope range: 2 to 15
Taxonomic classification: Fine, kaolinitic, thermic Rhodic Kanhapludults

Geographically Associated Soils

- Cecil, Madison, and Pacolet soils, which do not have a dark red upper subsoil

Typical Pedon

Butts County, Georgia; 2,200 feet southwest of Tussahaw Creek bridge at Georgia Highway 36; USGS topographic quadrangle, Jackson, GA (1985); lat. 33 degrees 21 minutes 57 seconds N. and long. 83 degrees 55 minutes 24 seconds W.

Ap—0 to 10 inches; dark brown (7.5YR 3/3) sandy loam; weak fine granular structure; very friable; many fine and common medium roots; few fine flakes of mica: moderately acid; clear smooth boundary.

Bt1—10 to 20 inches; dark reddish brown (2.5YR 3/4) clay; weak medium subangular blocky structure; firm; few fine roots; few distinct clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt2—20 to 55 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm; few medium roots; common distinct clay films on faces of peds; strongly acid; clear wavy boundary.

BC—55 to 60 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine flakes of mica; strongly acid; gradual wavy boundary.

Figure 10.—Profile of Lloyd sandy loam. This well drained soil has a subsoil that extends to a depth of 60 inches or more.

Range in Characteristics

Thickness of the solum: 40 to more than 60 inches
Reaction: Very strongly acid to slightly acid, except where lime has been applied

A or Ap horizon:
Thickness—4 to 10 inches
Color—hue of 2.5YR to 7.5YR, value of 3 or 4, and chroma of 2 to 6
Texture—sandy loam or sandy clay loam

Bt horizon (upper part):
Color—hue of 10R or 2.5YR, value of 3, and chroma of 4 or 6
Texture—sandy clay, clay loam, or clay

Bt horizon (lower part):
Color—hue of 10R or 2.5YR, value of 4, and chroma of 4 to 8
Texture—sandy clay or clay
Mottles—in shades of brown and yellow in some pedons

BC horizon (where present):
Color—similar to colors of the lower Bt horizon
Texture—clay loam or sandy clay loam

C horizon (where present):
Color—hue of 10R or 2.5YR, value of 3 or 4, and chroma of 6 or 8; or multicolored in shades of red, brown, and yellow
Texture—saprolite that crushes to loam, sandy clay loam, or clay loam
Mottles—in shades of brown and yellow in some pedons

Madison Series

Depth class: Very deep
Agricultural drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from mica schist or mica gneiss
Landscape: Piedmont
Landform: Hills
Slope range: 2 to 30 percent
Taxonomic classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Pacolet and Saw soils, which do not have many mica flakes in the lower part of the solum
- Wilkes soils, which are shallow and have mixed mineralogy
- Winnsboro soils, which are deep and have mixed mineralogy
- Wynott soils, which have mixed mineralogy and have a sticky and plastic subsoil

Typical Pedon

Jasper County, Georgia; 5.3 miles northeast of Monticello on Georgia Highway 83, about 300 feet west of road; USGS topographic quadrangle, Monticello, GA (1972); lat. 33 degrees 21 minutes 51 seconds N. and long. 83 degrees 37 minutes 42 seconds W.

A—0 to 5 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; many fine roots; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt1—5 to 10 inches; yellowish red (5YR 5/6) sandy clay; weak medium subangular blocky structure; firm; few fine roots; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt2—10 to 17 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bt3—17 to 24 inches; red (2.5YR 4/6) sandy clay; moderate medium subangular blocky structure; firm; few fine roots; few faint and distinct clay films on faces of peds; many fine flakes of mica; strongly acid; gradual wavy boundary.

BC—24 to 38 inches; red (2.5YR 4/6) sandy clay loam; common medium prominent yellow (10YR 7/6) and common medium prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; few faint and distinct clay films on faces of peds; many fine flakes of mica; strongly acid; gradual wavy boundary (fig. 11).

C1—38 to 50 inches; multicolored yellowish red (5YR 5/8), reddish yellow (7.5YR 6/8), and brown (10YR 4/3) saprolite that crushes to sandy clay loam; massive; very friable; many fine and medium flakes of mica; strongly acid; gradual wavy boundary.

C2—50 to 60 inches; multicolored brown (10YR 4/3), reddish yellow (7.5YR 6/8), and yellowish red (5YR 5/8) saprolite that crushes to sandy loam; massive; very friable; many fine flakes of mica; strongly acid.

Range in Characteristics

Thickness of the solum: 27 to 50 inches
Reaction: Very strongly acid or strongly acid, except where lime has been applied
Content of flakes of mica: Common or many in the upper horizons; many in the lower part of the solum

A horizon:
Thickness—4 to 8 inches
Color—hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6
Texture—sandy loam or sandy clay loam

BA or BE horizon (where present):
Color—hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 or 6
Texture—sandy clay loam

Bt horizon:
Color—hue of 10R to 5YR, value of 4 or 5, and chroma of 4 to 8
Texture—sandy clay or clay
Mottles—in shades of red and brown in some subhorizons

BC horizon (where present):
Color—hue of 2.5YR to 7.5YR, value of 4, and chroma of 4 to 8; or multicolored in shades of red and brown
Texture—sandy clay loam
Mottles—in shades of brown and yellow

C horizon:
Color—hue of 2.5YR or 5YR, value of 4, and chroma of 6; or multicolored in shades of red, brown, and yellow
Texture—saprolite that crushes to sandy loam or sandy clay loam
Mottles—in shades of brown

Figure 11.—A profile of Madison sandy loam that has a wavy boundary between the subsoil and the saprolite. This well drained soil has many flakes of mica in the subsoil.

Pacolet Series

Depth class: Very deep
Agricultural drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from felsic crystalline rock
Landscape: Piedmont
Landform: Hills
Slope range: 2 to 35 percent
Taxonomic classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Ashlar and Saw soils, which have hard bedrock at a depth of 23 to 40 inches
- Cecil soils, which have a thicker solum than the Pacolet soil
- Madison soils, which have many mica flakes in the lower solum

Typical Pedon

Jasper County, Georgia; 1,500 feet northwest on Georgia Highway 221 from intersection with Georgia Highway 212, about 400 feet north of road; USGS topographic quadrangle, Stewart, GA (1964); lat. 33 degrees 23 minutes 13 seconds N. and long. 83 degrees 48 minutes 39 seconds W.

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt1—7 to 20 inches; red (2.5YR 4/6) sandy clay; weak medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—20 to 25 inches; red (2.5YR 4/6) sandy clay; common medium prominent reddish yellow (5YR 6/8) mottles; weak medium subangular blocky structure; firm; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

BC—25 to 33 inches; red (2.5YR 4/6) sandy clay loam; common medium distinct yellowish red (5YR 5/6) and common fine prominent pink (5YR 8/4) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C1—33 to 54 inches; multicolored red (2.5YR 4/6), yellowish red (5YR 4/6), and pink (7.5YR 8/3) saprolite that crushes to sandy clay loam; massive; friable; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C2—54 to 60 inches; multicolored red (2.5YR 4/6), yellowish red (5YR 4/6), and very pale brown (10YR 8/4) saprolite that crushes to sandy loam; massive; friable; many fine flakes of mica; very strongly acid.

Range in Characteristics

Thickness of the solum: 24 to 40 inches
Reaction: Very strongly acid or strongly acid, except where lime has been applied

A or Ap horizon:
Thickness—2 to 10 inches
Color—hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 4
Texture—sandy loam or sandy clay loam

BA or BE horizon (where present):
Color—hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 or 6

Texture—sandy clay loam

Bt horizon (upper part):
Color—hue of 2.5YR, value of 4, and chroma of 6 or 8
Texture—sandy clay or clay

Bt horizon (lower part):
Color—hue of 2.5YR, value of 4, and chroma of 6 or 8
Texture—sandy clay or clay
Mottles—in shades of yellow and brown

BC horizon:
Color—hue of 2.5YR, value of 4, and chroma of 6; or multicolored in shades of red, yellow, pink, and white
Texture—sandy clay loam

C horizon:
Color—multicolored in shades of red, brown, yellow, pink, and white
Texture—saprolite that crushes to sandy loam, sandy clay loam, or clay loam

Saw Series

Depth class: Moderately deep
Agricultural drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from granite or granite gneiss
Landscape: Piedmont
Landform: Hills
Slope range: 6 to 25 percent slopes
Taxonomic classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Ashlar soils, which have a coarse-loamy particle-size control section
- Helena soils, which have mixed mineralogy
- Madison and Pacolet soils, which have a thicker solum than the Saw soil

Typical Pedon

Butts County, Georgia; 2.3 miles north of Georgia Highway 16 on Stark Road, 2,600 feet north-northwest; USGS topographic quadrangle, Lloyd Shoals Dam, GA (1964); lat. 33 degrees 19 minutes 57 seconds N. and long. 83 degrees 52 minutes 12 seconds W.

A—0 to 6 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; friable; many fine and common medium roots; few fine flakes of mica; strongly acid; clear smooth boundary.

E—6 to 11 inches; yellowish brown (10YR 5/6) sandy loam; weak fine granular structure; friable; common fine and few medium roots; few fine flakes of mica; strongly acid; clear wavy boundary.

Bt1—11 to 20 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt2—20 to 28 inches; red (2.5YR 4/6) clay; weak medium subangular blocky structure; friable; common fine flakes of mica; strongly acid; clear smooth boundary.

Figure 12.—Profile of Saw sandy loam. Hard granite gneiss occurs at a depth of about 32 inches. These soils generally are mapped with Pacolet soils in complexes.

C—28 to 32 inches; red (2.5YR 4/8) saprolite that crushes to sandy clay loam; few fine faint red (2.5YR 4/8) and common medium distinct strong brown (7.5YR 4/6) mottles; massive; very friable; common fine flakes of mica; very strongly acid; clear wavy boundary.

R—32 inches; hard granite gneiss (fig. 12)

Range in Characteristics

Thickness of the solum: 22 to 38 inches
Depth to hard bedrock: 22 to 40 inches
Reaction: Very strongly acid or strongly acid, except where lime has been applied

A horizon:
Thickness—5 to 7 inches
Color—hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 3 or 4
Texture—sandy loam

E horizon (where present):
Color—hue of 10YR, value of 4 or 5, and chroma of 4 or 6
Texture—sandy loam

Bt horizon:
Color—hue of 2.5YR or 5YR, value of 4, and chroma of 6 or 8
Texture—sandy clay or clay

C horizon (where present):
Color—hue of 2.5YR, value of 4, and chroma of 6 or 8; or multicolored in shades of red, yellow, and brown
Texture—saprolite that crushes to sandy clay loam or sandy loam
Mottles—in shades of brown and yellow

R layer:
Type of bedrock—unweathered igneous or high-grade metamorphic rock

Toccoa Series

Depth class: Very deep
Agricultural drainage class: Moderately well drained or well drained
Permeability: Moderately rapid
Parent material: Alluvium
Seasonal high water table: Apparent, at a depth of 3.3 to 5.0 feet from December through April
Landscape: Piedmont
Landform: Flood plains
Slope range: 0 to 2 percent
Taxonomic classification: Coarse-loamy, mixed, active, nonacid, thermic Typic Udifluvents

Geographically Associated Soils

- Buncombe soils, which are sandy throughout
- Chewacla soils, which have a fine-loamy particle-size control section and have gray iron depletions within 24 inches of the surface

Typical Pedon

Jasper County, Georgia; 4.5 miles northwest of Monticello on Georgia Highway 212, about 1.3 miles southwest on county road, 200 feet north-northwest of road; USGS

topographic quadrangle, Lloyd Shoals Dam, GA (1964); lat. 33 degrees 21 minutes 50 seconds N. and long. 83 degrees 48 minutes 54 seconds W.

A—0 to 4 inches; brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; many fine flakes of mica; strongly acid; clear smooth boundary.

C1—4 to 22 inches; strong brown (7.5YR 4/6) sandy loam; massive; very friable; few medium roots; many fine flakes of mica; strongly acid; gradual wavy boundary.

C2—22 to 35 inches; yellowish red (5YR 4/6) sandy loam; massive; very friable; few fine and medium roots; many fine flakes of mica; strongly acid; gradual wavy boundary.

C3—35 to 43 inches; yellowish red (5YR 4/6) loamy sand; thin strata of strong brown (7.5YR 4/6) loam; massive; very friable; many fine flakes of mica; moderately acid; clear wavy boundary.

C4—43 to 57 inches; yellowish red (5YR 4/6) sandy loam; massive; very friable; moderately acid; clear wavy boundary.

C5—57 to 60 inches; 45 percent strong brown (7.5YR 4/6) loam; massive; friable; 15 percent brown (10YR 5/3) iron depletions; 40 percent dark yellowish brown (10YR 4/4) masses of oxidized iron; strongly acid.

Range in Characteristics

Depth to iron depletions with chroma of 2 or less (where present): More than 30 inches
Reaction: Strongly acid to slightly acid; moderately acid or slightly acid in some subhorizons between a depth of 10 and 40 inches
Other distinctive properties: Bedding planes and thin strata of sandy or loamy material that occur throughout the C horizons

A horizon:
Thickness—4 to 8 inches
Color—hue of 5YR to 10YR, value of 3 or 4, and chroma of 2 to 4
Texture—fine sandy loam, sandy loam, or loam

C horizon (upper part):
Color—hue of 5YR to 10YR, value of 3 to 6, and chroma of 4 to 8
Texture—fine sandy loam or sandy loam; may have thin strata of contrasting texture

C horizon (lower part):
Color—hue of 5YR to 10YR, value of 3 to 6, and chroma of 4 to 8
Texture—loamy sand, fine sandy loam, sandy loam, or loam; may have thin strata of contrasting texture
Redoximorphic features (where present)—iron depletions in shades of brown and gray

Towaliga Series

Depth class: Very deep
Agricultural drainage class: Well drained
Permeability: Moderate
Parent material: Loamy colluvium weathered from fault line material, such as mylonite or flinty, crushed rock, over residuum weathered from felsic crystalline rock
Landscape: Piedmont
Landform: Hills

Slope range: 10 to 35 percent
Taxonomic classification: Fine, kaolinitic, thermic Typic Hapludults

Geographically Associated Soils

- Bethlehem soils, which have soft bedrock at a depth of 20 to 40 inches and are not skeletal
- Tussahaw soils, which have soft bedrock at a depth of 20 to 40 inches
- Pacolet soils, which have a clayey particle-size control section and are not skeletal

Typical Pedon

Butts County, Georgia; 1,800 feet south of Georgia Highway 16 at Yellow Water Creek bridge; USGS topographic quadrangle, Lloyd Shoals Dam, GA (1985); lat. 33 degrees 17 minutes 52 seconds N. and long. 83 degrees 51 minutes 4 seconds W.

A—0 to 3 inches; dark brown (10YR 3/3) extremely gravelly loam; weak fine granular structure; very friable; many fine and very fine roots; 70 percent quartz gravel; very strongly acid; clear smooth boundary.

BA—3 to 11 inches; yellowish brown (10YR 5/4) very gravelly loam; weak fine granular structure; very friable; common fine and few coarse roots; 40 percent quartz gravel and 10 percent quartz cobbles; very strongly acid; clear wavy boundary.

Bw1—11 to 21 inches; strong brown (7.5YR 5/6) very gravelly sandy loam; weak fine subangular blocky structure; friable; few coarse roots; 35 percent quartz gravel and 20 percent quartz cobbles; very strongly acid; gradual wavy boundary.

Bw2—21 to 33 inches; strong brown (7.5YR 5/8) very gravelly sandy loam; weak fine subangular blocky structure; friable; few medium roots; 35 percent quartz gravel and 10 percent quartz cobbles; very strongly acid; clear wavy boundary.

2Bt—33 to 48 inches; yellowish red (5YR 5/8) clay; few fine faint yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

2BC—48 to 65 inches; yellowish red (5YR 5/8) clay loam; many medium faint strong brown (7.5YR 5/8) and common fine prominent very pale brown (10YR 8/4) mottles; weak medium subangular blocky structure; firm; common distinct clay films on faces of peds; very strongly acid.

Range in Characteristics

Thickness of the solum: 40 to more than 60 inches
Content of coarse fragments: 35 to 75 percent subangular and angular fragments of quartz gravels and cobbles in the A and BE horizons; 15 to 75 percent subangular and angular fragments of quartz gravels and cobbles in the Bt horizon
Reaction: Very strongly acid or strongly acid

A horizon:
Thickness—2 to 6 inches
Color—hue of 10YR, value of 3, and chroma of 1 to 3
Texture (fine-earth fraction)—loam, sandy loam, or silt loam

Bw horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 8
Texture (fine-earth fraction)—sandy loam, sandy clay loam, loam, or silt loam

2Bt horizon:
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8
Texture (fine-earth fraction)—clay loam, sandy clay, or clay

2BC horizon (where present):
Color—similar to the 2Bt horizon
Texture (fine-earth fraction)—sandy clay loam or clay loam

Tussahaw Series

Depth class: Moderately deep
Agricultural drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from sillimanite schist
Landscape: Piedmont
Landform: Hills
Slope range: 10 to 35 percent
Taxonomic classification: Loamy-skeletal, mixed, thermic Typic Hapludults

Geographically Associated Soils

- Pacolet soils, which are in the less steep positions on the landscape
- Towaliga soils, which are on ridges, shoulders, and side slopes

Typical Pedon

Butts County, Georgia; 800 feet west of bridge at Georgia Highway 16 and Ocmulgee River to Stark Road, 1,600 feet to water plant, 1,600 feet northeast along water plant access road to road cut; USGS topographic quadrangle, Lloyd Shoals Dam, GA (1964); lat. 33 degrees 18 minutes 44 seconds N. and long. 83 degrees 50 minutes 20 seconds W.

A—0 to 3 inches; dark brown (10YR 3/3) channery sandy loam; weak fine granular structure; very friable; 18 percent fragments of sillimanite schist; many fine and few medium roots; very strongly acid; clear smooth boundary.

Bt1—3 to 9 inches; brown (7.5YR 4/4) very channery sandy clay loam; weak fine subangular blocky structure; friable; 35 percent fragments of sillimanite schist; few fine roots; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt2—9 to 20 inches; strong brown (7.5YR 4/6) very channery sandy clay loam; weak fine subangular blocky structure; friable; 50 percent fragments of sillimanite schist; few fine roots; few fine flakes of mica; strongly acid; gradual wavy boundary.

C—20 to 27 inches; yellowish red (5YR 4/6) very channery sandy clay loam; massive; friable; 60 percent fragments of sillimanite schist; few fine flakes of mica; strongly acid; clear wavy boundary.

Cr—27 to 41 inches; multicolored, weathered sillimanite schist in shades of red and brown.

R—41 inches; hard, fractured sillimanite schist

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to soft bedrock: 20 to 40 inches (fig. 13)
Depth to hard bedrock: More than 40 inches
Content of coarse fragments: 15 to 70 percent gravel, cobbles, and stones from sillimanite schist in the A and B horizons; 35 to 70 percent gravel, cobbles, and stones from sillimanite schist in the C horizons
Reaction: Very strongly acid or strongly acid

Figure 13.—Profile of Tussahaw channery sandy loam. This pedon has soft bedrock at a depth of about 27 inches and hard bedrock at a depth of about 41 inches. This soil occurs along the Towaliga Fault Zone.

A horizon:
Thickness—2 to 6 inches
Color—hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4
Texture (fine-earth fraction)—sandy loam

BA or BE horizon (where present):
Color—hue of 10YR, value of 4 or 5, and chroma of 4
Texture (fine-earth fraction)—sandy loam or sandy clay loam

Bt horizon:
Color—hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 8
Texture (fine-earth fraction)—sandy clay loam or clay loam

BC horizon (where present):
Color—hue of 5YR, value of 5, and chroma of 8
Texture (fine-earth fraction)—clay loam

C horizon (where present):
Color—hue of 5YR, value of 4 or 5, and chroma of 6
Texture (fine-earth fraction)—sandy clay loam

Cr horizon:
Type of bedrock—multicolored, weathered sillimanite schist that has occasional interbeds of mica schist and quartz mica gneiss; soil material often extends downward into nearly vertical cracks in horizon

R layer:
Type of bedrock—unweathered fractured sillimanite schist, mica schist, or quartz mica gneiss

Wake Series

Depth class: Shallow
Agricultural drainage class: Excessively drained
Permeability: Rapid
Parent material: Residuum weathered from granite and granite gneiss
Landscape: Piedmont
Landform: Hills
Slope range: 2 to 25 percent
Taxonomic classification: Mixed, thermic Lithic Udipsamments

Geographically Associated Soils

- Ashlar soils, which have hard bedrock at a depth of 23 to 40 inches
- Pacolet and Saw soils, which have a fine particle-size control section

Typical Pedon

Butts County, Georgia; 2.75 miles southeast of Jackson on Highway 42/87 to Higgins Road, 0.75 mile northeast on Higgins Road across Plymale Creek to pipeline; follow pipeline 700 feet west-southwest, northwest of pipeline and northeast of creek; USGS topographic quadrangle, Jackson, GA (1964); lat. 33 degrees 16 minutes 19 seconds N. and long. 83 degrees 54 minutes 16 seconds W.

A—0 to 4 inches; very dark grayish brown (7.5YR 3/2) loamy sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

C—4 to 13 inches; dark yellowish brown (7.5YR3/4) loamy sand; single grained; very friable; common fine and medium roots; strongly acid; clear wavy boundary.

R—13 inches; hard granite gneiss.

Range in Characteristics

Thickness of the solum: 4 to 17 inches
Depth to hard bedrock: 11 to 19 inches
Content of coarse fragments: 0 to 15 percent
Reaction: Very strongly acid to moderately acid

A horizon:
Thickness—3 to 6 inches
Color—hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 3 or 4
Texture—loamy sand

C horizon:
Color—hue of 7.5YR or 2.5Y, value of 4 to 6, and chroma of 4 or 6; or multicolored
Texture—loamy sand, sandy loam, or coarse sandy loam

Cr horizon (where present):
Type of bedrock—multicolored, weathered granite or granite gneiss

R layer:
Type of bedrock—unweathered igneous or high-grade metamorphic rock

Wehadkee Series

Depth class: Very deep
Agricultural drainage class: Poorly drained or very poorly drained
Permeability: Moderate
Parent material: Alluvium
Seasonal high water table: Apparent, at a depth of 0 to 1.0 foot from November through May
Landscape: Piedmont
Landform: Flood plains
Slope range: 0 to 1 percent
Taxonomic classification: Fine-loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts

Geographically Associated Soils

- Chewacla soils, which are in the higher positions on flood plains
- Toccoa soils, which are near natural stream levees

Typical Pedon

Butts County, Georgia; 1.0 mile south of the Newton County line on Georgia Highway 36 to Barnett Bridge Road, 3.6 miles west to Fincherville Road, 1.9 miles north to curve, 3,200 feet northeast; USGS topographic quadrangle, Worthville, GA (1964); lat. 33 degrees 26 minutes 0 seconds N. and long. 83 degrees 55 minutes 22 seconds W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; slightly sticky; many very fine and fine roots; common fine prominent strong brown (7.5YR 4/6) oxidized rhizospheres; strongly acid; clear smooth boundary.

Bg—6 to 27 inches; grayish brown (10YR 5/2) clay loam; weak medium subangular blocky structure; slightly sticky; few fine roots; common medium prominent strong brown (7.5YR 5/6) masses of oxidized iron; strongly acid; clear wavy boundary.

Cg1—27 to 45 inches; grayish brown (10YR 5/2) loamy sand; massive; non-sticky; moderately acid; clear wavy boundary.

Cg2—45 to 55 inches; dark grayish brown (10YR 4/2) sandy clay loam; massive; slightly sticky; moderately acid; clear wavy boundary.

Cg3—55 to 60 inches; dark grayish brown (10YR 4/2) loamy sand; massive; non-sticky; moderately acid.

Range in Characteristics

Thickness of the solum: 20 to more than 45 inches
Depth to iron depletions with chroma of 2 or less: 0 to 10 inches
Reaction: Very strongly acid to neutral; some part of the 10- to 40-inch control section is moderately acid to neutral

A horizon:
- Thickness—6 to 10 inches
- Color—hue of 10YR, value of 3 to 5, and chroma of 1 to 4
- Texture—sandy loam, loam, sandy clay loam, silty clay loam, or clay loam
- Redoximorphic features—oxidized rhizospheres in shades of red and brown in some pedons

Bg horizon:
- Color—neutral in hue or hue of 10YR or 2.5Y; value of 4 to 6 and chroma of 0 to 2
- Texture—loam, silt loam, sandy clay loam, silty clay loam, or clay loam; pockets of finer or coarser materials in some pedons
- Redoximorphic features—soft masses of oxidized iron in shades of red, brown, and yellow in some pedons

Cg horizon:
- Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2
- Texture—loamy sand, sandy loam, or loam; stratified layers of sand, sandy loam, sandy clay loam, or clay loam in some pedons
- Redoximorphic features—soft masses of oxidized iron in shades of red, brown, and yellow

Wilkes Series

Depth class: Shallow
Agricultural drainage class: Well drained
Permeability: Moderately slow
Parent material: Residuum weathered from mafic crystalline rock
Landscape: Piedmont
Landform: Hills
Slope range: 6 to 30 percent
Taxonomic classification: Loamy, mixed, active, thermic, shallow Typic Hapludalfs

Geographically Associated Soils

- Madison soils, which are very deep and have a clayey particle-size control section
- Winnsboro soils, which are deep
- Wynott soils, which are moderately deep

Typical Pedon

Jasper County, Georgia; 10.5 miles southwest of Monticello on Georgia Highway 83, about 1.0 mile west on U.S. Forest Service road, 20 feet southwest of road; USGS topographic quadrangle, Berner, GA (1973); lat. 33 degrees 10 minutes 50 seconds N. and long. 83 degrees 48 minutes 22 seconds W.

A—0 to 3 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine and few medium roots; few fine flakes of mica; strongly acid; abrupt smooth boundary.

E—3 to 6 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; common fine and few medium roots; few fine flakes of mica; strongly acid; abrupt smooth boundary.

Bt—6 to 10 inches; dark yellowish brown (10YR 4/6) sandy clay loam; moderate medium subangular blocky structure; firm; common very fine and fine and few medium roots; few distinct clay films on faces of peds; many fine and medium flakes of mica; moderately acid; clear wavy boundary.

BC—10 to 18 inches; dark yellowish brown (10YR 4/6) sandy clay loam; few fine distinct yellow (10YR 7/6) and few fine prominent yellowish red (5YR 5/8) mottles; few seams of clay material; weak medium subangular blocky structure; firm; few medium roots; few distinct clay films on faces of peds; many fine and medium flakes of mica; slightly acid; clear wavy boundary.

Cr—18 to 45 inches; greenish black, yellowish brown, and gray weathered rock that crushes to sandy loam; few medium roots in the upper part; common fine flakes of mica; slightly acid; clear wavy boundary.

R—45 inches; hard rock.

Range in Characteristics

Thickness of the solum: 10 to 18 inches
Depth to soft bedrock: 10 to 20 inches
Depth to hard bedrock: 43 to 60 inches
Content of coarse fragments: 0 to 15 percent throughout
Reaction: Strongly acid to slightly acid in the upper horizons; slightly acid to slightly alkaline in the lower horizons

A horizon:
Thickness—2 to 5 inches
Color—hue of 10YR, value of 3 or 4, and chroma of 2 or 3
Texture—sandy loam

E horizon (where present):
Color—hue of 10YR, value of 5, and chroma of 3 or 4
Texture—sandy loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6
Texture—sandy clay loam, clay loam, or clay; weighted average content of clay in the control section is 18 to 35 percent

BC horizon (where present):
Color—hue of 10YR, value of 4, and chroma of 6; or multicolored in shades of brown and red
Texture—sandy clay loam
Mottles—in shades of red and yellow

C horizon (where present):
Color—multicolored in shades of brown and olive
Texture—saprolite that crushes to sandy loam or sandy clay loam

Cr horizon:
Type of bedrock—multicolored, weathered rock in shades of black, brown, and gray

R layer:
Type of bedrock—unweathered intermediate or mafic crystalline rock

Winnsboro Series

Depth class: Deep
Agricultural drainage class: Well drained
Permeability: Slow
Parent material: Residuum weathered from mafic crystalline rock
Landscape: Piedmont
Landform: Hills
Slope range: 6 to 30 percent
Taxonomic classification: Fine, mixed, active, thermic Typic Hapludalfs

Geographically Associated Soils

- Madison soils, which are very deep and have a clayey particle-size control section
- Wilkes soils, which are shallow
- Wynott soils, which are moderately deep

Typical Pedon

Butts County, Georgia; 0.85 mile north of the Monroe County line on Georgia Highway 23, about 150 feet northeast of road; USGS topographic quadrangle, Berner, GA (1973); lat. 33 degrees 12 minutes 24 seconds N. and long. 83 degrees 51 minutes 26 seconds W.

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; friable; many fine and very fine roots; 5 percent angular quartz pebbles; strongly acid; abrupt smooth boundary.

A2—2 to 5 inches; dark brown (10YR 3/3) sandy loam; weak fine granular structure; friable; common fine and very fine roots; 5 percent angular quartz pebbles; strongly acid; clear smooth boundary.

EB—5 to 9 inches; dark yellowish brown (10YR 4/6) sandy loam; many medium distinct (10YR 4/3) brown mottles; weak fine granular structure; friable; common very fine and few medium roots; moderately acid; clear smooth boundary.

Bt1—9 to 19 inches; strong brown (7.5YR 4/6) clay; moderate medium angular and weak medium subangular blocky structure; firm; sticky and plastic; common very fine and few medium roots; many prominent clay films on faces of peds; common very fine flakes of mica; moderately acid; gradual wavy boundary.

Bt2—19 to 23 inches; dark yellowish brown (10YR 4/6) clay; moderate medium subangular blocky structure; firm; sticky; few very fine roots; common distinct clay films on faces of peds; common very fine flakes of mica; common medium prominent masses of manganese; moderately acid; gradual wavy boundary.

BC—23 to 42 inches; dark yellowish brown (10YR 4/6) sandy clay loam; common medium faint brownish yellow (10YR 6/6), common medium faint dark grayish brown (10YR 4/2), and common medium distinct very pale brown (10YR 8/3) mottles; friable; few very fine roots; many very fine flakes of mica; slightly acid; gradual wavy boundary.

CB—42 to 50 inches; multicolored dark yellowish brown (10YR 4/6), very pale brown (10YR 8/3), brownish yellow (10YR 6/6), and dark grayish brown (10YR 4/2) sandy clay loam; friable; many very fine flakes of mica; slightly acid; gradual wavy boundary.

C—50 to 56 inches; multicolored dark yellowish brown (10YR 4/6), pale brown (10YR 6/3), and black (10YR 2/1) saprolite that crushes to sandy clay loam; massive; very friable; many very fine flakes of mica; slightly acid; clear wavy boundary.

Cr—56 inches; greenish black, brown, and gray weathered rock.

Range in Characteristics

Thickness of the solum: 23 to 40 inches
Depth to soft bedrock: 42 to 60 inches
Content of coarse fragments: 0 to 10 percent throughout
Reaction: Strongly acid to slightly acid in the upper horizons; slightly acid to slightly alkaline in the lower horizons

A horizon:
Thickness—3 to 8 inches
Color—hue of 10YR, value of 3, and chroma of 2 or 3
Texture—sandy loam

E horizon (where present):
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—sandy loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8
Texture—clay

BC or CB horizon (where present):
Color—hue of 10YR, value of 4, and chroma of 6
Texture—sandy clay loam
Mottles—in shades of yellow and brown

C horizon:
Color—multicolored in shades of brown, yellow, and black
Texture—saprolite that crushes to sandy loam or sandy clay loam

Cr horizon:
Type of bedrock—multicolored, weathered rock

Wynott Series

Depth class: Moderately deep
Agricultural drainage class: Well drained
Permeability: Slow
Parent material: Residuum weathered from mafic crystalline rock
Landscape: Piedmont
Landform: Hills
Slope range: 6 to 30 percent
Taxonomic classification: Fine, mixed, active, thermic Typic Hapludalfs

Geographically Associated Soils

- Madison soils, which are very deep and have a clayey particle-size control section
- Wilkes soils, which are shallow
- Winnsboro soils, which are deep

Typical Pedon

Jasper County, Georgia; 9.5 miles south of Monticello on Georgia Highway 83, about 3.7 miles south on Juliette Road, 1,300 feet northeast on U.S. Government road, 50

feet south of road; USGS topographic quadrangle, Berner, GA (1973); lat. 33 degrees 9 minutes 13 seconds N. and long. 83 degrees 47 minutes 52 seconds W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; friable; many fine and few medium roots; strongly acid; clear smooth boundary.

E—5 to 9 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; friable; common fine and few medium roots; moderately acid; gradual wavy boundary.

Bt—9 to 17 inches; dark yellowish brown (10YR 4/6) clay; moderate medium subangular blocky structure; very firm; sticky and plastic; few fine roots; common prominent clay films on faces of peds; common fine flakes of mica; moderately acid; gradual wavy boundary.

BC—17 to 23 inches; dark yellowish brown (10YR 4/6) sandy clay; common medium distinct brown (10YR 5/3) mottles; very firm; sticky and plastic; few distinct clay films on faces of peds; common fine flakes of mica; slightly acid; gradual wavy boundary.

C—23 to 37; multicolored dark yellowish brown (10YR 4/6), pale brown (10YR 6/3), and black (10YR 2/1) saprolite that crushes to sandy loam; massive; very friable; many fine flakes of mica; slightly acid; clear wavy boundary.

Cr—37 to 60 inches; greenish black, brown, and gray weathered rock

Range in Characteristics

Thickness of the solum: 21 to 40 inches
Depth to soft bedrock: 22 to 40 inches
Depth to hard bedrock: 55 to more than 60 inches
Content of coarse fragments: 0 to 15 percent throughout
Reaction: Strongly acid to slightly acid in the upper horizons; moderately acid to slightly acid in the lower horizons

A horizon:
Thickness—3 to 5 inches
Color—hue of 10YR, value of 3, and chroma of 2 or 3
Texture—sandy loam

E horizon (where present):
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—sandy loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8
Texture—clay

BC horizon (where present):
Color—hue of 10YR, value of 4, and chroma of 6
Texture—sandy clay
Mottles—in shades of brown

C horizon:
Color—multicolored in shades of brown, yellow, and black
Texture—saprolite that crushes to sandy loam or sandy clay loam

Cr horizon:
Type of bedrock—multicolored, weathered rock

Formation of the Soils

This section describes the factors of soil formation and relates them to the soils in the survey area.

Factors of Soil Formation

Soil characteristics are determined by the physical and mineralogical composition of the parent material; the plants and animals living on and in the soil; the climate under which the parent material accumulated and has existed since accumulation; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material (Byers and others, 1938). All of these factors influence every soil, but the significance of each factor varies from place to place. In one area, one factor may dominate soil formation; in another area, a different factor may dominate.

The interrelationships among these five factors are complex, and the effects of any one factor cannot be isolated and completely evaluated. It is convenient, however, to describe each factor separately and to indicate the probable effects of each.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. The chemical and mineralogical composition of the soil is derived largely from the parent material.

The soils in Butts County primarily formed in materials weathered from crystalline rock, such as granite gneiss, intermediate gneiss, amphibolites, mica schist, and basic hornfels (Georgia Department of Natural Resources, 1976). Cecil, Pacolet, and Saw soils are examples of soils that have a red subsoil and formed in parent material weathered mainly from granite gneiss or intermediate gneiss. Madison soils have a high content of mica and formed in parent material weathered mainly from mica schist. Lloyd is an example of a soil that has a dark surface layer and subsoil and formed in parent material weathered mainly from amphibolites and hornblende gneiss or intermediate gneiss. Wilkes and Wynott soils are examples of soils that have a firm, sticky, and plastic subsoil and formed in parent material that weathered mainly from basic hornfels. Stream alluvium is adjacent to all the streams in Butts County. It includes sandy, loamy, and clayey sediments transported from the uplands. Chewacla, Toccoa, and Wehadkee soils formed in stream alluvium.

Plants and Animals

The effects of plants, animals, and other organisms on soil formation are significant. Plants and animals increase the content of organic matter and nitrogen, increase or decrease the content of plant nutrients, and change soil structure and porosity.

Plants recycle nutrients, add organic matter, and provide food and cover for animals. They stabilize the surface layer so that the soil-forming processes can continue. They also provide a more stable environment for the soil-forming processes by protecting the soils from extremes in temperature. The soils in Butts County formed under a succession of briers, brambles, and woody plants that were dominated by

pines and hardwoods. Hardwoods eventually suppressed most other plants and became the predominant type of plant in the climax plant community.

Animals rearrange soil material by making the surface rough, by forming and filling channels, and by shaping the peds and voids. The soil is mixed by ants, wasps, worms, and spiders, which make channels; by crustaceans, such as crayfish; and by turtles and foxes, which dig burrows. Humans affect the soil-forming processes by tilling, removing natural vegetation and establishing different plants, and reducing or increasing the level of fertility. Bacteria, fungi, and other micro-organisms hasten the decomposition of organic matter and increase the rate at which nutrients are released for plant growth.

The net gains and losses caused by plants and animals are important in Butts County. Within the relatively small confines of the survey area, however, one soil is not significantly different from another because of the effects of plants and animals.

Climate

The present climate of Butts County is probably similar to the climate that existed when the soils formed. The relatively high amount of rainfall and the warm temperatures contribute to rapid soil formation. Rainfall and temperature are the two most important climatic features that relate to soil properties.

Water from precipitation is essential in the formation of soil. Water dissolves soluble materials and is used by plants and animals. It transports material from one part of the soil to another part and from one area of the landscape to another area.

The soils in Butts County formed under a thermic temperature regime. In a thermic temperature regime, the mean soil temperature at a depth of 20 inches is 59 to 72 degrees F. Based on the mean annual air temperature, the estimated soil temperature in Butts County is 64 degrees F. The rate of chemical reactions and other processes in the soil depends to some extent on temperature. In addition, temperature affects the type and quality of vegetation, the amount and kind of organic matter, and the rate at which the organic matter decomposes.

Relief

Relief is the elevations or inequalities of a land surface considered collectively. The color of the soil, the degree of wetness, the thickness of the A horizon, the content of organic matter, and the plant cover are commonly related to relief.

In Butts County, the most obvious effects of relief are those that relate to soil color and the degree of soil wetness. Most Cecil soils have a reddish subsoil, whereas Wehadkee soils have a grayish brown subsoil. The difference in color results from a difference in relief and a corresponding difference in internal drainage. Because Cecil soils are in the higher positions on the landscape and are better drained than Wehadkee soils, Cecil soils are better oxidized and have a reddish subsoil.

The movement of water across the surface and through the soil is controlled mostly by relief. Water flowing across the surface commonly carries solid particles and causes erosion or deposition, depending on the kind of relief. In the sloping areas, the soils are drier because more water runs off and less water penetrates the surface. The soils in low-lying areas are commonly wetter because they receive the water that flows off and through the soils in the higher positions of the landscape.

Time

The length of time that the soil-forming processes have acted on the parent material helps to determine the characteristics of the soil. Determinations of when soil

formation began in the survey area are not exact. Most of the soils are considered mature.

Mature soils are in equilibrium with the environment. They are characterized by pedogenic horizons that are readily recognizable and a carbon content that decreases regularly as the depth increases. Some areas of the Cecil soils are on stable landscapes where the soil-forming processes have been active for thousands of years. These mature soils have a solum that is highly weathered and a zone of illuviation that is well expressed.

Erosion has removed most of the zone of eluviation in some places. Toccoa soils are young soils. They receive sediment annually from floodwater. They are stratified and are not old enough to have a zone of illuviation. They do not have pedogenic horizons and are characterized by a carbon content that decreases irregularly as the depth increases.

Processes of Horizon Differentiation

One or more soil-forming processes are involved in the formation of soil horizons. These processes are the accumulation of organic matter; the chemical weathering, mainly by hydrolysis, of primary minerals into silicate clay minerals; the translocation of silicate clay and some silt-sized particles from one horizon to another; and the reduction and transfer of iron.

These processes have been active in the formation of most of the soils in Butts County. The interaction of the first four processes is indicated by the strongly expressed horizons in Cecil and Madison soils. All five processes have probably been active in the formation of the moderately well drained Cataula and Hard Labor soils.

Some organic matter has accumulated in all of the soils in the survey area. Most of the soils contain moderately low amounts of organic matter in the surface layer. The content of organic matter in the surface layer ranges from low, as in Buncombe soils, to high, as in Wehadkee soils.

The translocation of clay minerals is an important process in the development of many soils in the survey area. As clay minerals are removed from the A horizon, they accumulate as clay films on the faces of peds, in pores, and in root channels in the B horizon.

As silicate clay forms from primary minerals, some iron is commonly released as hydrated oxides. These oxides are generally red. Even if they occur in small amounts, they give the soil material a brownish color. They are largely responsible for the strong brown, yellowish brown, or reddish brown colors that are dominant in the subsoil of many soils in the survey area.

The reduction and transfer of iron has occurred in all of the soils that are not characterized by good natural drainage. This process, known as gleying, is evidenced by a gray matrix color and by iron or clay depletions. Some of the iron may be reoxidized and segregated and thus form yellow, brown, red, or other brightly colored masses of iron accumulation in an essentially gray matrix in the subsoil. Nodules or concretions of iron ore or manganese also commonly form as a result of this process. Soil features associated with chemically reduced iron are referred to as redoximorphic features (Vepraskas, 1992).

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" (available in local offices of the Natural Resources Conservation Service or on the Internet).

Alluvial. Pertaining to material or processes associated with transportation and subaerial deposition by concentrated running water.

Alluvium. Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding plane. A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. An informal term loosely applied to various portions of a flood plain.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chisel. Tillage implement that has one or more soil-penetrating points that shatters or loosens hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. See Redoximorphic features.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Filtering capacity (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Footslope. The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hill. A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope. A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Iron depletions. See Redoximorphic features.

Irrigation. Application of water to soils to assist in production of crops.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Lithic. See Hard bedrock.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Mass movement. A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses. See Redoximorphic features.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline.

Miscellaneous area. A kind of map unit that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Paralithic. See Soft bedrock.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as

"permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturated hydraulic conductivity (K_{sat}). See Permeability.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 6 percent
Sloping	6 to 10 percent
Strongly sloping	10 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 45 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow water movement. (in tables). The slow movement of water through the soil adversely affects the specified use.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained*

(each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Swale. A shallow, open depression that lacks a defined channel but can funnel overland or subsurface flow into a draingeway.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or a sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thermic soil temperature regime. The mean annual soil temperature is 15 degrees C or higher but lower than 22 degrees C, and the difference between mean summer and mean winter soil temperatures is more than 6 degrees C either at a depth of 50 cm from the soil surface or at a densic, lithic, or paralithic contact, whichever is shallower.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Temperature and Precipitation

(Recorded in the period 1961-90 at Experiment, GA)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature lower than	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	51.5	31.7	41.6	73	4	40	4.88	2.91	6.64	8	0.3
February----	56.1	34.3	45.2	77	12	60	4.74	2.64	6.60	6	0.2
March-------	64.6	42.2	53.4	82	21	181	5.64	3.08	7.89	7	0.1
April-------	73.0	49.5	61.3	87	30	348	4.47	1.92	6.64	6	0.0
May---------	79.8	57.3	68.6	92	41	576	4.35	2.64	5.88	6	0.0
June--------	86.3	64.7	75.5	97	49	761	4.07	1.91	5.93	6	0.0
July--------	88.4	67.9	78.2	98	58	873	4.87	2.78	6.72	8	0.0
August------	87.6	67.1	77.4	97	57	849	4.26	2.35	5.94	6	0.0
September---	82.8	61.5	72.1	94	43	664	3.08	1.38	4.54	5	0.0
October-----	73.7	49.6	61.7	87	31	364	3.05	1.17	4.81	4	0.0
November----	64.9	42.4	53.6	80	21	173	3.50	2.05	4.79	5	0.0
December----	55.4	34.8	45.1	75	10	63	4.59	2.47	6.45	7	0.0
Yearly:											
Average---	72.0	50.3	61.1	---	---	---	---	---	---	---	---
Extreme---	102	-8	---	99	2	---	---	---	---	---	---
Total-----	---	---	---	---	---	4952	51.48	44.57	57.88	74	0.6

Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Experiment, GA)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Mar. 21	Apr. 1	Apr. 12
2 year in 10 later than--	Mar. 13	Mar. 26	Apr. 6
5 year in 10 later than--	Feb. 27	Mar. 14	Mar. 28
First freezing temperature in fall:			
1 yr in 10 earlier than--	Nov. 15	Nov. 2	Oct. 22
2 yr in 10 earlier than--	Nov. 22	Nov. 7	Oct. 27
5 yr in 10 earlier than--	Dec. 6	Nov. 15	Nov. 5

Growing Season

(Recorded for the period 1961-90 at Experiment, GA)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	252	224	199
8 years in 10	262	231	207
5 years in 10	281	245	222
2 years in 10	301	258	236
1 year in 10	311	265	244

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
ArC	Ashlar-Rock outcrop-Wake complex, 2 to 10 percent slopes	190	0.2
AwE	Ashlar-Wake complex, 15 to 25 percent slopes	160	0.1
BwB	Buncombe loamy sand, 0 to 6 percent slopes, occasionally flooded	380	0.3
CaB	Cataula sandy loam, 2 to 6 percent slopes	2,140	1.8
CeB	Cecil sandy loam, 2 to 6 percent slopes	10,735	8.8
CeC2	Cecil sandy loam, 6 to 10 percent slopes, moderately eroded	3,130	2.6
CfB2	Cecil sandy clay loam, 2 to 6 percent slopes, moderately eroded	12,410	10.2
CfC3	Cecil sandy clay loam, 6 to 10 percent slopes, severely eroded	18,820	15.5
CuC	Cecil-Urban land complex, 2 to 10 percent slopes	1,660	1.4
CwA	Chewacla loam, 0 to 2 percent slopes, frequently flooded	7,400	6.1
DAM	Dam	5	*
HaB	Hard Labor sandy loam, 2 to 6 percent slopes	3,500	2.9
HzB	Helena sandy loam, 2 to 6 percent slopes	470	0.4
HzC	Helena sandy loam, 6 to 10 percent slopes	640	0.5
LdB	Lloyd sandy loam, 2 to 6 percent slopes	660	0.5
LfB3	Lloyd sandy clay loam, 2 to 6 percent slopes, severely eroded	960	0.8
LfD3	Lloyd sandy clay loam, 6 to 15 percent slopes, severely eroded	1,220	1.0
MaB2	Madison sandy loam, 2 to 6 percent slopes, moderately eroded	690	0.6
MaD2	Madison sandy loam, 6 to 15 percent slopes, moderately eroded	480	0.4
MaE2	Madison sandy loam, 15 to 30 percent slopes, moderately eroded	440	0.4
MdB3	Madison sandy clay loam, 2 to 6 percent slopes, severely eroded	1,260	1.0
MdD3	Madison sandy clay loam, 6 to 15 percent slopes, severely eroded	9,620	7.9
MdE3	Madison sandy clay loam, 15 to 30 percent slopes, severely eroded	1,470	1.2
MsD	Madison-Bethlehem complex, 6 to 15 percent slopes, stony	2,460	2.0
MsE	Madison-Bethlehem complex, 15 to 30 percent slopes, stony	790	0.7
PaB	Pacolet sandy loam, 2 to 6 percent slopes	1,460	1.2
PaD2	Pacolet sandy loam, 6 to 15 percent slopes, moderately eroded	4,150	3.4
PaE2	Pacolet sandy loam, 15 to 25 percent slopes, moderately eroded	1,490	1.2
PfB3	Pacolet sandy clay loam, 2 to 6 percent slopes, severely eroded	1,250	1.0
PfD3	Pacolet sandy clay loam, 6 to 15 percent slopes, severely eroded	14,380	11.8
PfE3	Pacolet sandy clay loam, 15 to 25 percent slopes, severely eroded	1,390	1.1
PsD	Pacolet-Saw complex, 6 to 15 percent slopes, stony	7,020	5.8
PsE	Pacolet-Saw complex, 15 to 25 percent slopes, stony	1,580	1.3
PtF	Pacolet-Towaliga-Tussahaw complex, 10 to 35 percent slopes, cobbly	220	0.2
PuE	Pacolet-Urban land complex, 10 to 25 percent slopes	140	0.1
RoC	Rock outcrop	40	*
ToA	Toccoa sandy loam, 0 to 2 percent slopes, frequently flooded	990	0.8
Ua	Urban land	200	0.2
Ud	Udorthents, loamy	550	0.5
W	Water	2,720	2.2
WeA	Wehadkee loam, 0 to 1 percent slopes, frequently flooded	840	0.7
WkA	Wehadkee loam, 0 to 1 percent slopes, frequently flooded, ponded	1,060	0.9
WyD	Wynott-Wilkes-Winnsboro complex, 6 to 15 percent slopes, stony	90	*
WyE	Wynott-Wilkes-Winnsboro complex, 15 to 30 percent slopes, stony	140	0.1
	Total	121,400	100.0

* Less than 0.1 percent.

Nonirrigated Yields for Corn, Cotton Lint, and Grass Hay by Map Unit Component

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability	Corn	Cotton lint	Grass hay
		Bu	Lbs	Tons
ArC:				
Ashlar	4e	---	---	2.50
Rock outcrop	8s	---	---	---
Wake	4s	---	---	1.00
AwE:				
Ashlar	6e	---	---	2.50
Wake	6s	---	---	1.00
BwB:				
Buncombe	4w	---	---	3.50
CaB:				
Cataula	2e	65.00	700.00	3.50
CeB:				
Cecil	2e	80.00	750.00	4.80
CeC2:				
Cecil	3e	75.00	700.00	4.50
CfB2:				
Cecil	3e	70.00	500.00	3.90
CfC3:				
Cecil	4e	60.00	400.00	3.50
CuC:				
Cecil	8s	---	---	---
Urban land	8s	---	---	---
CwA:				
Chewacla	4w	95.00	550.00	5.00
DAM:				
Dam	---	---	---	---
HaB:				
Hard Labor	2e	80.00	700.00	4.50
HzB:				
Helena	2e	70.00	575.00	3.20
HzC:				
Helena	3e	65.00	500.00	2.90
LdB:				
Lloyd	2e	90.00	700.00	5.00
LfB3:				
Lloyd	3e	80.00	500.00	4.50
LfD3:				
Lloyd	4e	70.00	350.00	3.50

Nonirrigated Yields for Corn, Cotton Lint, and Grass Hay by Map Unit Component—Continued

Map symbol and soil name	Land capability	Corn	Cotton lint	Grass hay
		Bu	Lbs	Tons
MaB2:				
Madison	2e	80.00	700.00	4.80
MaD2:				
Madison	4e	70.00	500.00	4.00
MaE2:				
Madison	7e	---	---	3.50
MdB3:				
Madison	3e	70.00	500.00	3.50
MdD3:				
Madison	6e	60.00	400.00	2.90
MdE3:				
Madison	7e	---	---	2.50
MsD:				
Madison	4e	65.00	500.00	4.00
Bethlehem	4e	60.00	350.00	3.50
MsE:				
Madison	7e	---	---	3.50
Bethlehem	7e	---	---	3.00
PaB:				
Pacolet	2e	70.00	700.00	4.00
PaD2:				
Pacolet	4e	65.00	550.00	3.50
PaE2:				
Pacolet	6e	---	---	3.00
PfB3:				
Pacolet	3e	65.00	500.00	3.50
PfD3:				
Pacolet	6e	---	---	2.90
PfE3:				
Pacolet	7e	---	---	2.50
PsD:				
Pacolet	4e	65.00	550.00	3.50
Saw	4e	55.00	350.00	3.00
PsE:				
Pacolet	6e	---	---	3.00
Saw	6e	---	---	2.50
PtF:				
Pacolet	7e	---	---	3.00
Towaliga	7e	---	---	2.50
Tussahaw	7s	---	---	1.00

Nonirrigated Yields for Corn, Cotton Lint, and Grass Hay by Map Unit Component—Continued

Map symbol and soil name	Land capability	Corn	Cotton lint	Grass hay
		Bu	Lbs	Tons
PuE:				
Pacolet	8s	---	---	---
Urban land	8s	---	---	---
RoC:				
Rock outcrop	8s	---	---	---
ToA:				
Toccoa	3w	90.00	900.00	4.50
Ua:				
Urban land	8s	---	---	---
Ud:				
Udorthents	---	---	---	---
WeA:				
Wehadkee	6w	---	---	---
WkA:				
Wehadkee	8w	---	---	---
WyD:				
Wynott	4e	60.00	600.00	3.00
Wilkes	6e	---	---	2.00
Winnsboro	4e	60.00	600.00	3.00
WyE:				
Wynott	7e	---	---	2.50
Wilkes	7s	---	---	1.50
Winnsboro	6e	---	---	2.50

Nonirrigated Yields for Pasture, Soybeans, and Wheat by Map Unit Component

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability	Pasture	Soybeans	Wheat
		AUM	Bu	Bu
ArC:				
Ashlar	4e	4.00	---	---
Rock outcrop	8s	---	---	---
Wake	4s	2.50	---	---
AwE:				
Ashlar	6e	4.00	---	---
Wake	6s	2.50	---	---
BwB:				
Buncombe	4w	4.00	---	---
CaB:				
Cataula	2e	6.50	35.00	45.00
CeB:				
Cecil	2e	8.00	35.00	45.00
CeC2:				
Cecil	3e	7.50	30.00	40.00
CfB2:				
Cecil	3e	6.50	25.00	35.00
CfC3:				
Cecil	4e	6.00	20.00	30.00
CuC:				
Cecil	8s	---	---	---
Urban land	8s	---	---	---
CwA:				
Chewacla	4w	9.00	40.00	50.00
DAM:				
Dam	---	---	---	---
HaB:				
Hard Labor	2e	8.00	30.00	40.00
HzB:				
Helena	2e	5.80	25.00	35.00
HzC:				
Helena	3e	5.50	25.00	35.00
LdB:				
Lloyd	2e	8.50	35.00	50.00
LfB3:				
Lloyd	3e	8.00	25.00	45.00
LfD3:				
Lloyd	4e	7.00	20.00	40.00

Nonirrigated Yields for Pasture, Soybeans, and Wheat by Map Unit Component—Continued

Map symbol and soil name	Land capability	Pasture	Soybeans	Wheat
		AUM	Bu	Bu
MaB2:				
Madison	2e	8.00	35.00	45.00
MaD2:				
Madison	4e	7.00	25.00	35.00
MaE2:				
Madison	7e	6.50	---	---
MdB3:				
Madison	3e	6.50	25.00	35.00
MdD3:				
Madison	6e	5.50	20.00	25.00
MdE3:				
Madison	7e	5.00	---	---
MsD:				
Madison	4e	6.00	25.00	35.00
Bethlehem	4e	5.50	20.00	25.00
MsE:				
Madison	7e	5.50	---	---
Bethlehem	7e	5.00	---	---
PaB:				
Pacolet	2e	8.00	30.00	40.00
PaD2:				
Pacolet	4e	7.50	20.00	25.00
PaE2:				
Pacolet	6e	6.00	---	---
PfB3:				
Pacolet	3e	6.50	20.00	30.00
PfD3:				
Pacolet	6e	5.50	---	---
PfE3:				
Pacolet	7e	5.00	---	---
PsD:				
Pacolet	4e	6.50	20.00	25.00
Saw	4e	4.50	15.00	20.00
PsE:				
Pacolet	6e	6.00	---	---
Saw	6e	4.00	---	---
PtF:				
Pacolet	7e	6.00	---	---
Towaliga	7e	4.00	---	---
Tussahaw	7s	2.50	---	---

Nonirrigated Yields for Pasture, Soybeans, and Wheat by Map Unit Component—Continued

Map symbol and soil name	Land capability	Pasture	Soybeans	Wheat
		AUM	Bu	Bu
PuE:				
Pacolet	8s	---	---	---
Urban land	8s	---	---	---
RoC:				
Rock outcrop	8s	---	---	---
ToA:				
Toccoa	3w	8.00	25.00	35.00
Ua:				
Urban land	8s	---	---	---
Ud:				
Udorthents	---	---	---	---
WeA:				
Wehadkee	6w	8.50	---	---
WkA:				
Wehadkee	8w	---	---	---
WyD:				
Wynott	4e	5.50	30.00	40.00
Wilkes	6e	4.50	---	---
Winnsboro	4e	6.00	30.00	40.00
WyE:				
Wynott	7e	5.00	---	---
Wilkes	7s	4.00	---	---
Winnsboro	6e	5.50	---	---

Prime Farmland and other Important Farmlands

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map symbol	Map unit name	Farmland Classification
CaB	Cataula sandy loam, 2 to 6 percent slopes	Prime farmland in all areas
CeB	Cecil sandy loam, 2 to 6 percent slopes	Prime farmland in all areas
HaB	Hard Labor sandy loam, 2 to 6 percent slopes	Prime farmland in all areas
HzB	Helena sandy loam, 2 to 6 percent slopes	Prime farmland in all areas
LdB	Lloyd sandy loam, 2 to 6 percent slopes	Prime farmland in all areas
MaB2	Madison sandy loam, 2 to 6 percent slopes, moderately eroded	Prime farmland in all areas
PaB	Pacolet sandy loam, 2 to 6 percent slopes	Prime farmland in all areas
CeC2	Cecil sandy loam, 6 to 10 percent slopes, moderately eroded	Farmland of statewide importance
CfB2	Cecil sandy clay loam, 2 to 6 percent slopes, moderately eroded	Farmland of statewide importance
CwA	Chewacla loam, 0 to 2 percent slopes, frequently flooded	Farmland of statewide importance
HzC	Helena sandy loam, 6 to 10 percent slopes	Farmland of statewide importance
ToA	Toccoa sandy loam, 0 to 2 percent slopes, frequently flooded	Farmland of statewide importance

Forestland Productivity

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Potential for seedling mortality		Potential productivity			Trees to manage
	Rating class and limiting features	Value	Common trees	Site index	Volume of wood fiber	
					cu ft/ac	
ArC:						
Ashlar	Low		loblolly pine	75	---	loblolly pine, shortleaf pine
			northern red oak	---	---	
			shortleaf pine	65	---	
Rock outcrop	Not rated		---	---	---	---
Wake	Moderate		hickory	---	---	loblolly pine, shortleaf pine
	Available water	0.50	loblolly pine	60	72	
			northern red oak	---	---	
			post oak	---	---	
			shortleaf pine	50	72	
AwE:						
Ashlar	Moderate		loblolly pine	75	---	loblolly pine, shortleaf pine
	Available water	0.50	northern red oak	---	---	
			shortleaf pine	65	---	
Wake	High		hickory	---	---	loblolly pine, shortleaf pine
	Available water	1.00	loblolly pine	60	72	
			northern red oak	---	---	
			post oak	---	---	
			shortleaf pine	50	72	
BwB:						
Buncombe	Low		American sycamore	---	---	loblolly pine, yellow-poplar
			elm	---	---	
			hickory	---	---	
			loblolly pine	90	129	
			northern red oak	---	---	
			river birch	---	---	
			southern red oak	---	---	
			sweetgum	---	---	
			yellow-poplar	100	114	
CaB:						
Cataula	Low		loblolly pine	80	114	loblolly pine
			shortleaf pine	66	100	
			southern red oak	---	---	
			sweetgum	---	---	
			white oak	---	---	
			yellow-poplar	---	---	
CeB:						
Cecil	Low		loblolly pine	83	114	loblolly pine, shortleaf pine
			northern red oak	---	---	
			post oak	---	---	
			scarlet oak	---	---	
			shortleaf pine	69	114	
			southern red oak	---	---	
			sweetgum	---	---	
			white oak	---	---	
			yellow-poplar	---	---	

Forestland Productivity—Continued

Map symbol and soil name	Potential for seedling mortality		Potential productivity			Trees to manage
	Rating class and limiting features	Value	Common trees	Site index	Volume of wood fiber	
					cu ft/ac	
CeC2:						
Cecil	Low		loblolly pine	83	114	loblolly pine, shortleaf pine
			northern red oak	---	---	
			post oak	---	---	
			scarlet oak	---	---	
			shortleaf pine	69	114	
			southern red oak	---	---	
			sweetgum	---	---	
			white oak	---	---	
			yellow-poplar	---	---	
CfB2, CfC3:						
Cecil	Low		loblolly pine	72	100	loblolly pine, shortleaf pine
			northern red oak	---	---	
			shortleaf pine	63	100	
			white oak	---	---	
CuC:						
Cecil	Low		loblolly pine	---	---	loblolly pine, shortleaf pine
			northern red oak	---	---	
			post oak	---	---	
			scarlet oak	---	---	
			shortleaf pine	---	---	
			southern red oak	---	---	
			sweetgum	---	---	
			white oak	---	---	
			yellow-poplar	---	---	
Urban land	Not rated		---	---	---	---
CwA:						
Chewacla	High Wetness	1.00	blackgum	---	---	loblolly pine, sweetgum, yellow-poplar
			eastern cottonwood	---	---	
			green ash	---	---	
			loblolly pine	95	143	
			red maple	---	---	
			southern red oak	---	---	
			sweetgum	---	---	
			water oak	---	---	
			willow oak	---	---	
			yellow-poplar	95	100	
DAM:						
Dam	Not rated		---	---	---	---
HaB:						
Hard Labor	Low		loblolly pine	88	129	loblolly pine
			yellow-poplar	---	---	
			white oak	---	---	
			southern red oak	---	---	
			sweetgum	---	---	
			hickory	---	---	

Forestland Productivity—Continued

Map symbol and soil name	Potential for seedling mortality		Potential productivity			Trees to manage
	Rating class and limiting features	Value	Common trees	Site index	Volume of wood fiber	
					cu ft/ac	
HzB, HzC:						
Helena	Low		black oak	---	---	loblolly pine, yellow-poplar
			hickory	---	---	
			loblolly pine	84	114	
			northern red oak	---	---	
			shortleaf pine	66	100	
			southern red oak	---	---	
			sweetgum	---	---	
			white oak	---	---	
			yellow-poplar	---	---	
LdB:						
Lloyd	Low		loblolly pine	85	114	loblolly pine, shortleaf pine
			northern red oak	---	---	
			shortleaf pine	75	114	
			southern red oak	---	---	
			white oak	---	---	
			yellow-poplar	---	---	
LfB3, LfD3:						
Lloyd	Low		loblolly pine	71	100	loblolly pine, shortleaf pine
			northern red oak	---	---	
			shortleaf pine	68	100	
			southern red oak	---	---	
			white oak	---	---	
MaB2, MaD2, MaE2:						
Madison	Low		loblolly pine	80	114	loblolly pine, shortleaf pine
			northern red oak	---	---	
			shortleaf pine	64	100	
			southern red oak	---	---	
			white oak	---	---	
			yellow-poplar	---	---	
MdB3, MdD3, MdE3:						
Madison	Low		loblolly pine	72	100	loblolly pine, shortleaf pine
			northern red oak	---	---	
			shortleaf pine	62	86	
			white oak	---	---	
MsD, MsE:						
Madison	Low		loblolly pine	80	114	loblolly pine, shortleaf pine
			northern red oak	---	---	
			shortleaf pine	64	100	
			southern red oak	---	---	
			white oak	---	---	
			yellow-poplar	---	---	
Bethlehem	Low		loblolly pine	67	103	loblolly pine, shortleaf pine
			scarlet oak	---	---	
			chestnut oak	---	---	
			white oak	---	---	
			black oak	---	---	

Forestland Productivity—Continued

Map symbol and soil name	Potential for seedling mortality		Potential productivity			Trees to manage
	Rating class and limiting features	Value	Common trees	Site index	Volume of wood fiber	
					cu ft/ac	
PaB:						
Pacolet	Low		hickory	---	---	loblolly pine, shortleaf pine
			loblolly pine	78	114	
			northern red oak	---	---	
			shortleaf pine	70	114	
			white oak	---	---	
			yellow-poplar	---	---	
PaD2, PaE2:						
Pacolet	Low		hickory	---	---	loblolly pine, shortleaf pine
			loblolly pine	78	114	
			northern red oak	---	---	
			shortleaf pine	70	114	
			white oak	---	---	
			yellow-poplar	---	---	
PfB3, PfD3, PfE3:						
Pacolet	Low		loblolly pine	70	86	loblolly pine, shortleaf pine
			shortleaf pine	60	86	
			yellow-poplar	---	---	
PsD, PsE:						
Pacolet	Low		hickory	---	---	loblolly pine, shortleaf pine
			loblolly pine	78	114	
			northern red oak	---	---	
			shortleaf pine	70	114	
			white oak	---	---	
			yellow-poplar	---	---	
Saw	Low		shortleaf pine	60	100	loblolly pine, shortleaf pine
			loblolly pine	70	100	
			white oak	---	---	
			scarlet oak	---	---	
			northern red oak	---	---	
			post oak	---	---	
PtF:						
Pacolet	Low		hickory	---	---	loblolly pine, shortleaf pine
			loblolly pine	78	114	
			northern red oak	---	---	
			shortleaf pine	70	114	
			white oak	---	---	
			yellow-poplar	---	---	
Towaliga	Low		hickory	---	---	---
			loblolly pine	78	114	
			northern red oak	---	---	
			shortleaf pine	70	114	
			white oak	---	---	
			yellow-poplar	---	---	
Tussahaw	Low		chestnut oak	---	---	shortleaf pine
			loblolly pine	67	103	
			scarlet oak	---	---	
			white oak	---	---	

Forestland Productivity—Continued

Map symbol and soil name	Potential for seedling mortality		Potential productivity			Trees to manage
	Rating class and limiting features	Value	Common trees	Site index	Volume of wood fiber	
					cu ft/ac	
PuE:						
Pacolet	Low		hickory	---	---	loblolly pine, shortleaf pine
			loblolly pine	---	---	
			northern red oak	---	---	
			shortleaf pine	---	---	
			Virginia pine	---	---	
			white oak	---	---	
			yellow-poplar	---	---	
Urban land	Not rated		---	---	---	---
RoC:						
Rock outcrop	Not rated		---	---	---	---
ToA:						
Toccoa	Low		loblolly pine	90	129	loblolly pine, yellow-poplar
			southern red oak	---	---	
			sweetgum	---	---	
			yellow-poplar	107	114	
Ua:						
Urban land	Not rated		---	---	---	---
Ud:						
Udorthents	Not rated		loblolly pine	50	72	loblolly pine
WeA:						
Wehadkee	High Wetness	1.00	yellow-poplar	---	---	green ash, sweetgum, willow oak, yellow-poplar
			sweetgum	---	---	
			loblolly pine	93	143	
			willow oak	---	---	
			water oak	---	---	
			green ash	---	---	
			American sycamore	---	---	
			river birch	---	---	
			blackgum	---	---	
			black willow	---	---	
WkA:						
Wehadkee	High Wetness	1.00	black willow	---	---	green ash, sweetgum, willow oak, yellow-poplar
			blackgum	---	---	
			green ash	---	---	
			water oak	---	---	
			willow oak	---	---	
WyD, WyE:						
Wynott	Low		hickory	---	---	loblolly pine
			loblolly pine	75	100	
			shortleaf pine	65	100	
			southern red oak	---	---	
			sweetgum	---	---	
			white oak	---	---	
			willow oak	---	---	
			yellow-poplar	---	---	

Forestland Productivity—Continued

Map symbol and soil name	Potential for seedling mortality		Potential productivity			Trees to manage
	Rating class and limiting features	Value	Common trees	Site index	Volume of wood fiber	
					cu ft/ac	
Wilkes	Low		hickory	---	---	loblolly pine
			loblolly pine	75	100	
			post oak	---	---	
			shortleaf pine	63	100	
			southern red oak	---	---	
			sweetgum	---	---	
			white oak	---	---	
Winnsboro	Low		loblolly pine	73	100	loblolly pine
			post oak	---	---	
			red maple	---	---	
			shortleaf pine	63	100	
			southern red oak	---	---	
			sweetgum	---	---	
			white oak	---	---	
			yellow-poplar	---	---	

Log Landings, Hazard of Erosion, and Suitability for Roads on Forestland

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.1 to 1.0. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Suitability for log landings		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ArC:						
Ashlar	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50
Rock outcrop	Not rated		Not rated		Not rated	
Wake	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50
AwE:						
Ashlar	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
Wake	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
BwB:						
Buncombe	Moderately suited		Slight		Moderately suited	
	Flooding	0.50			Flooding	0.50
CaB:						
Cataula	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
CeB:						
Cecil	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
CeC2:						
Cecil	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50
CfB2:						
Cecil	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
CfC3:						
Cecil	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50
CuC:						
Cecil	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50
Urban land	Not rated		Not rated		Not rated	
CwA:						
Chewacla	Poorly suited		Slight		Poorly suited	
	Flooding	1.00			Flooding	1.00
	Wetness	0.50			Wetness	0.50
	Low strength	0.50			Low strength	0.50

Log Landings, Hazard of Erosion, and Suitability for Roads on Forestland—Continued

Map symbol and soil name	Suitability for log landings		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DAM:						
Dam	Not rated		Not rated		Not rated	
HaB:						
Hard Labor	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
HzB:						
Helena	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
HzC:						
Helena	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50
LdB:						
Lloyd	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
LfB3:						
Lloyd	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
LfD3:						
Lloyd	Moderately suited		Severe		Moderately suited	
	Slope	0.50	Slope/erodibility	0.95	Slope	0.50
MaB2:						
Madison	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
MaD2:						
Madison	Moderately suited		Severe		Moderately suited	
	Slope	0.50	Slope/erodibility	0.95	Slope	0.50
MaE2:						
Madison	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
MdB3:						
Madison	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
MdD3:						
Madison	Moderately suited		Severe		Moderately suited	
	Slope	0.50	Slope/erodibility	0.95	Slope	0.50
MdE3:						
Madison	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
MsD:						
Madison	Moderately suited		Severe		Moderately suited	
	Slope	0.50	Slope/erodibility	0.95	Slope	0.50
Bethlehem	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50

Log Landings, Hazard of Erosion, and Suitability for Roads on Forestland—Continued

Map symbol and soil name	Suitability for log landings		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MsE:						
Madison	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
Bethlehem	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
PaB:						
Pacolet	Well suited		Slight		Well suited	
PaD2:						
Pacolet	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50
PaE2:						
Pacolet	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
PfB3:						
Pacolet	Well suited		Moderate		Well suited	
			Slope/erodibility	0.50		
PfD3:						
Pacolet	Moderately suited		Severe		Moderately suited	
	Slope	0.50	Slope/erodibility	0.95	Slope	0.50
PfE3:						
Pacolet	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
PsD:						
Pacolet	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50
Saw	Moderately suited		Moderate		Moderately suited	
	Slope	0.50	Slope/erodibility	0.50	Slope	0.50
PsE:						
Pacolet	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
Saw	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
PtF:						
Pacolet	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
Towaliga	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
Tussahaw	Poorly suited		Moderate		Poorly suited	
	Slope	1.00	Slope/erodibility	0.50	Slope	1.00
PuE:						
Pacolet	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
Urban land	Not rated		Not rated		Not rated	

Log Landings, Hazard of Erosion, and Suitability for Roads on Forestland—Continued

Map symbol and soil name	Suitability for log landings		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RoC:						
Rock outcrop	Not rated		Not rated		Not rated	
ToA:						
Toccoa	Poorly suited		Slight		Poorly suited	
	Flooding	1.00			Flooding	1.00
Ua:						
Urban land	Not rated		Not rated		Not rated	
Ud:						
Udorthents	Not rated		Not rated		Not rated	
WeA:						
Wehadkee	Poorly suited		Slight		Poorly suited	
	Flooding	1.00			Flooding	1.00
	Wetness	1.00			Wetness	1.00
	Low strength	0.50			Low strength	0.50
WkA:						
Wehadkee	Poorly suited		Slight		Poorly suited	
	Ponding	1.00			Ponding	1.00
	Flooding	1.00			Flooding	1.00
	Wetness	1.00			Wetness	1.00
	Low strength	0.50			Low strength	0.50
WyD:						
Wynott	Moderately suited		Severe		Moderately suited	
	Slope	0.50	Slope/erodibility	0.95	Slope	0.50
Wilkes	Moderately suited		Severe		Moderately suited	
	Slope	0.50	Slope/erodibility	0.95	Slope	0.50
Winnsboro	Moderately suited		Severe		Moderately suited	
	Slope	0.50	Slope/erodibility	0.95	Slope	0.50
WyE:						
Wynott	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
Wilkes	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00
Winnsboro	Poorly suited		Severe		Poorly suited	
	Slope	1.00	Slope/erodibility	0.95	Slope	1.00

Forestland Planting and Harvesting

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ArC:						
Ashlar	Well suited		Moderately suited Slope	0.50	Well suited	
Rock outcrop	Not rated		Not rated		Not rated	
Wake	Well suited		Moderately suited Slope	0.50	Well suited	
AwE:						
Ashlar	Well suited		Poorly suited Slope	0.75	Moderately suited Slope	0.50
Wake	Well suited		Poorly suited Slope	0.75	Well suited	
BwB:						
Buncombe	Well suited		Well suited		Well suited	
CaB:						
Cataula	Well suited		Well suited		Well suited	
CeB:						
Cecil	Well suited		Well suited		Well suited	
CeC2:						
Cecil	Well suited		Moderately suited Slope	0.50	Well suited	
CfB2:						
Cecil	Well suited		Well suited		Well suited	
CfC3:						
Cecil	Well suited		Moderately suited Slope	0.50	Well suited	
CuC:						
Cecil	Well suited		Moderately suited Slope	0.50	Well suited	
Urban land	Not rated		Not rated		Not rated	
CwA:						
Chewacla	Well suited		Well suited		Moderately suited Low strength	0.50
DAM:						
Dam	Not rated		Not rated		Not rated	
HaB:						
Hard Labor	Well suited		Well suited		Well suited	

Forestland Planting and Harvesting—Continued

Map symbol and soil name	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HzB:						
Helena	Moderately suited Stickiness; high plasticity index	0.50	Moderately suited Stickiness; high plasticity index	0.50	Well suited	
HzC:						
Helena	Moderately suited Stickiness; high plasticity index	0.50	Moderately suited Slope Stickiness; high plasticity index	0.50 0.50	Well suited	
LdB:						
Lloyd	Well suited		Well suited		Well suited	
LfB3:						
Lloyd	Well suited		Well suited		Well suited	
LfD3:						
Lloyd	Well suited		Moderately suited Slope	0.50	Well suited	
MaB2:						
Madison	Well suited		Well suited		Well suited	
MaD2:						
Madison	Well suited		Moderately suited Slope	0.50	Well suited	
MaE2:						
Madison	Well suited		Poorly suited Slope	0.75	Moderately suited Slope	0.50
MdB3:						
Madison	Well suited		Well suited		Well suited	
MdD3:						
Madison	Well suited		Moderately suited Slope	0.50	Well suited	
MdE3:						
Madison	Well suited		Poorly suited Slope	0.75	Moderately suited Slope	0.50
MsD:						
Madison	Well suited		Moderately suited Slope	0.50	Well suited	
Bethlehem	Well suited		Moderately suited Slope	0.50	Well suited	
MsE:						
Madison	Well suited		Poorly suited Slope	0.75	Moderately suited Slope	0.50
Bethlehem	Well suited		Poorly suited Slope	0.75	Moderately suited Slope	0.50
PaB:						
Pacolet	Well suited		Well suited		Well suited	

Forestland Planting and Harvesting—Continued

Map symbol and soil name	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PaD2:						
Pacolet	Well suited		Moderately suited Slope	0.50	Well suited	
PaE2:						
Pacolet	Well suited		Poorly suited Slope	0.75	Moderately suited Slope	0.50
PfB3:						
Pacolet	Well suited		Well suited		Well suited	
PfD3:						
Pacolet	Well suited		Moderately suited Slope	0.50	Well suited	
PfE3:						
Pacolet	Well suited		Poorly suited Slope	0.75	Moderately suited Slope	0.50
PsD:						
Pacolet	Well suited		Moderately suited Slope	0.50	Well suited	
Saw	Well suited		Moderately suited Slope	0.50	Well suited	
PsE:						
Pacolet	Well suited		Poorly suited Slope	0.75	Moderately suited Slope	0.50
Saw	Well suited		Poorly suited Slope	0.75	Moderately suited Slope	0.50
PtF:						
Pacolet	Well suited		Poorly suited Slope Rock fragments	0.75 0.50	Moderately suited Slope	0.50
Towaliga	Moderately suited Rock fragments	0.50	Poorly suited Slope Rock fragments	0.75 0.75	Moderately suited Slope	0.50
Tussahaw	Moderately suited Rock fragments	0.50	Unsuited Rock fragments Slope	1.00 0.75	Moderately suited Slope	0.50
PuE:						
Pacolet	Well suited		Poorly suited Slope	0.75	Well suited	
Urban land	Not rated		Not rated		Not rated	
RoC:						
Rock outcrop	Not rated		Not rated		Not rated	
ToA:						
Toccoa	Well suited		Well suited		Well suited	

Forestland Planting and Harvesting—Continued

Map symbol and soil name	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ua:						
Urban land	Not rated		Not rated		Not rated	
Ud:						
Udorthents	Moderately suited		Moderately suited		Moderately suited	
	Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
			Slope	0.50		
WeA:						
Wehadkee	Moderately suited		Moderately suited		Moderately suited	
	Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
WkA:						
Wehadkee	Poorly suited		Poorly suited		Poorly suited	
	Wetness	0.75	Wetness	0.75	Wetness	1.00
	Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
WyD:						
Wynott	Poorly suited		Poorly suited		Well suited	
	Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75		
			Slope	0.50		
Wilkes	Moderately suited		Moderately suited		Well suited	
	Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50		
			Slope	0.50		
Winnsboro	Poorly suited		Poorly suited		Well suited	
	Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75		
			Slope	0.50		
WyE:						
Wynott	Poorly suited		Poorly suited		Moderately suited	
	Stickiness; high plasticity index	0.75	Slope	0.75	Slope	0.50
			Stickiness; high plasticity index	0.75		
Wilkes	Moderately suited		Poorly suited		Moderately suited	
	Stickiness; high plasticity index	0.50	Slope	0.75	Slope	0.50
			Stickiness; high plasticity index	0.50		
Winnsboro	Poorly suited		Poorly suited		Moderately suited	
	Stickiness; high plasticity index	0.75	Slope	0.75	Slope	0.50
			Stickiness; high plasticity index	0.75		

Camp Areas and Picnic Areas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Camp areas		Picnic areas	
	Rating class and limiting features	Value	Rating class and limiting features	Value
ArC:				
Ashlar	Not limited		Not limited	
Rock outcrop	Not Rated		Not Rated	
Wake	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00
AwE:				
Ashlar	Very limited		Very limited	
	Slope	1.00	Slope	1.00
Wake	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00
BwB:				
Buncombe	Very limited		Somewhat limited	
	Flooding	1.00	Too sandy	0.79
	Too sandy	0.79		
CaB:				
Cataula	Somewhat limited		Somewhat limited	
	Slow water movement	0.94	Slow water movement	0.94
CeB:				
Cecil	Not limited		Not limited	
CeC2:				
Cecil	Somewhat limited		Somewhat limited	
	Slope	0.01	Slope	0.01
CfB2:				
Cecil	Not limited		Not limited	
CfC3:				
Cecil	Somewhat limited		Somewhat limited	
	Slope	0.01	Slope	0.01
CuC:				
Cecil	Not limited		Not limited	
Urban land	Not Rated		Not Rated	
CwA:				
Chewacla	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.40
DAM:				
Dam	Not Rated		Not Rated	

Camp Areas and Picnic Areas—Continued

Map symbol and soil name	Camp areas		Picnic areas	
	Rating class and limiting features	Value	Rating class and limiting features	Value
HaB:				
Hard Labor	Somewhat limited		Somewhat limited	
	Slow water movement	0.96	Slow water movement	0.96
HzB:				
Helena	Somewhat limited		Somewhat limited	
	Slow water movement	0.94	Slow water movement	0.94
	Depth to saturated zone	0.39	Depth to saturated zone	0.19
HzC:				
Helena	Somewhat limited		Somewhat limited	
	Slow water movement	0.94	Slow water movement	0.94
	Depth to saturated zone	0.39	Depth to saturated zone	0.19
	Slope	0.01	Slope	0.01
LdB:				
Lloyd	Not limited		Not limited	
LfB3:				
Lloyd	Not limited		Not limited	
LfD3:				
Lloyd	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
MaB2:				
Madison	Not limited		Not limited	
MaD2:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
MaE2:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
MdB3:				
Madison	Not limited		Not limited	
MdD3:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
MdE3:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
MsD:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
Bethlehem	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
MsE:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00

Camp Areas and Picnic Areas—Continued

Map symbol and soil name	Camp areas		Picnic areas	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Bethlehem	Very limited		Very limited	
	Slope	1.00	Slope	1.00
PaB:				
Pacolet	Not limited		Not limited	
PaD2:				
Pacolet	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
PaE2:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
PfB3:				
Pacolet	Not limited		Not limited	
PfD3:				
Pacolet	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
PfE3:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
PsD:				
Pacolet	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
Saw	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
PsE:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
Saw	Very limited		Very limited	
	Slope	1.00	Slope	1.00
PtF:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
Towaliga	Very limited		Very limited	
	Gravel content	1.00	Gravel content	1.00
	Slope	1.00	Slope	1.00
Tussahaw	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Large stones content	0.04	Large stones content	0.04
PuE:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
Urban land	Not Rated		Not Rated	
RoC:				
Rock outcrop	Not Rated		Not Rated	

Camp Areas and Picnic Areas—Continued

Map symbol and soil name	Camp areas		Picnic areas	
	Rating class and limiting features	Value	Rating class and limiting features	Value
ToA:				
Toccoa	Very limited		Somewhat limited	
	Flooding	1.00	Flooding	0.40
Ua:				
Urban land	Not Rated		Not Rated	
Ud:				
Udorthents	Not limited		Not limited	
WeA:				
Wehadkee	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.40
WkA:				
Wehadkee	Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00
	Flooding	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Flooding	0.40
WyD:				
Wynott	Somewhat limited		Somewhat limited	
	Slow water movement	0.94	Slow water movement	0.94
	Slope	0.37	Slope	0.37
Wilkes	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	0.37	Slope	0.37
	Slow water movement	0.15	Slow water movement	0.15
Winnsboro	Somewhat limited		Somewhat limited	
	Slow water movement	0.94	Slow water movement	0.94
	Slope	0.37	Slope	0.37
WyE:				
Wynott	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.94	Slow water movement	0.94
Wilkes	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slow water movement	0.15	Slow water movement	0.15
Winnsboro	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.94	Slow water movement	0.94

Playgrounds, Paths, and Trails

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Playgrounds		Paths and Trails	
	Rating class and limiting features	Value	Rating class and limiting features	Value
ArC:				
Ashlar	Very limited		Not limited	
	Slope	1.00		
	Depth to bedrock	0.84		
	Gravel content	0.05		
Rock outcrop	Not Rated		Not Rated	
Wake	Very limited		Not limited	
	Depth to bedrock	1.00		
	Slope	1.00		
	Gravel content	0.01		
AwE:				
Ashlar	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.50
	Depth to bedrock	0.84		
	Gravel content	0.05		
Wake	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.18
	Depth to bedrock	1.00		
	Gravel content	0.01		
BwB:				
Buncombe	Somewhat limited		Somewhat limited	
	Too sandy	0.79	Too sandy	0.79
	Flooding	0.60		
	Slope	0.12		
CaB:				
Cataula	Somewhat limited		Not limited	
	Slow water movement	0.94		
	Slope	0.50		
CeB:				
Cecil	Somewhat limited		Not limited	
	Slope	0.50		
CeC2:				
Cecil	Very limited		Not limited	
	Slope	1.00		
CfB2:				
Cecil	Somewhat limited		Not limited	
	Slope	0.50		
CfC3:				
Cecil	Very limited		Not limited	
	Slope	1.00		

Playgrounds, Paths, and Trails—Continued

Map symbol and soil name	Playgrounds		Paths and Trails	
	Rating class and limiting features	Value	Rating class and limiting features	Value
CuC:				
Cecil	Very limited		Not limited	
	Slope	1.00		
Urban land	Not Rated		Not Rated	
CwA:				
Chewacla	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.40
DAM:				
Dam	Not Rated		Not Rated	
HaB:				
Hard Labor	Somewhat limited		Not limited	
	Slow water movement	0.96		
	Slope	0.50		
HzB:				
Helena	Somewhat limited		Not limited	
	Slow water movement	0.94		
	Slope	0.50		
	Depth to saturated zone	0.39		
HzC:				
Helena	Very limited		Not limited	
	Slope	1.00		
	Slow water movement	0.94		
	Depth to saturated zone	0.39		
LdB:				
Lloyd	Somewhat limited		Not limited	
	Slope	0.50		
LfB3:				
Lloyd	Somewhat limited		Not limited	
	Slope	0.50		
LfD3:				
Lloyd	Very limited		Not limited	
	Slope	1.00		
MaB2:				
Madison	Somewhat limited		Not limited	
	Slope	0.50		
MaD2:				
Madison	Very limited		Not limited	
	Slope	1.00		
MaE2:				
Madison	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.92
MdB3:				
Madison	Somewhat limited		Not limited	
	Slope	0.50		

Playgrounds, Paths, and Trails—Continued

Map symbol and soil name	Playgrounds		Paths and Trails	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MdD3:				
Madison	Very limited		Not limited	
	Slope	1.00		
MdE3:				
Madison	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.92
MsD:				
Madison	Very limited		Not limited	
	Slope	1.00		
Bethlehem	Very limited		Not limited	
	Slope	1.00		
	Gravel content	0.99		
	Depth to bedrock	0.01		
MsE:				
Madison	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.92
Bethlehem	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.92
	Gravel content	0.99		
	Depth to bedrock	0.01		
PaB:				
Pacolet	Somewhat limited		Not limited	
	Slope	0.50		
PaD2:				
Pacolet	Very limited		Not limited	
	Slope	1.00		
PaE2:				
Pacolet	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.50
PfB3:				
Pacolet	Somewhat limited		Not limited	
	Slope	0.50		
PfD3:				
Pacolet	Very limited		Not limited	
	Slope	1.00		
PfE3:				
Pacolet	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.50
PsD:				
Pacolet	Very limited		Not limited	
	Slope	1.00		
Saw	Very limited		Not limited	
	Slope	1.00		
	Depth to bedrock	0.29		
PsE:				
Pacolet	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.50

Playgrounds, Paths, and Trails—Continued

Map symbol and soil name	Playgrounds		Paths and Trails	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Saw	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.50
	Depth to bedrock	0.29		
PtF:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
Towaliga	Very limited		Very limited	
	Gravel content	1.00	Slope	1.00
	Slope	1.00		
Tussahaw	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Large stones content	1.00	Large stones content	0.04
	Gravel content	0.96		
	Depth to bedrock	0.74		
PuE:				
Pacolet	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.18
Urban land	Not Rated		Not Rated	
RoC:				
Rock outcrop	Not Rated		Not Rated	
ToA:				
Toccoa	Very limited		Somewhat limited	
	Flooding	1.00	Flooding	0.40
Ua:				
Urban land	Not Rated		Not Rated	
Ud:				
Udorthents	Somewhat limited		Not limited	
	Slope	0.88		
WeA:				
Wehadkee	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.40
WkA:				
Wehadkee	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Ponding	1.00
	Ponding	1.00	Flooding	0.40
WyD:				
Wynott	Very limited		Not limited	
	Slope	1.00		
	Slow water movement	0.94		
	Depth to bedrock	0.03		
	Gravel content	0.01		

Playgrounds, Paths, and Trails—Continued

Map symbol and soil name	Playgrounds		Paths and Trails	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Wilkes	Very limited		Not limited	
	Slope	1.00		
	Depth to bedrock	1.00		
	Slow water movement	0.15		
	Gravel content	0.01		
	Large stones content	0.01		
Winnsboro	Very limited		Not limited	
	Slope	1.00		
	Slow water movement	0.94		
WyE:				
Wynott	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.92
	Slow water movement	0.94		
	Depth to bedrock	0.03		
	Gravel content	0.01		
Wilkes	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.92
	Depth to bedrock	1.00		
	Slow water movement	0.15		
	Gravel content	0.01		
	Large stones content	0.01		
Winnsboro	Very limited		Somewhat limited	
	Slope	1.00	Slope	0.92
	Slow water movement	0.94		

Dwellings

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Dwellings without basements		Dwellings with basements	
	Rating class and limiting features	Value	Rating class and limiting features	Value
ArC:				
Ashlar	Somewhat limited		Very limited	
	Depth to hard bedrock	0.84	Depth to hard bedrock	1.00
Rock outcrop	Not rated		Not rated	
Wake	Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
AwE:				
Ashlar	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Depth to hard bedrock	0.84	Depth to hard bedrock	1.00
Wake	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
BwB:				
Buncombe	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
CaB:				
Cataula	Not limited		Somewhat limited	
			Depth to saturated zone	0.97
CeB:				
Cecil	Not limited		Not limited	
CeC2:				
Cecil	Somewhat limited		Somewhat limited	
	Slope	0.01	Slope	0.01
CfB2:				
Cecil	Not limited		Not limited	
CfC3:				
Cecil	Somewhat limited		Somewhat limited	
	Slope	0.01	Slope	0.01
CuC:				
Cecil	Not limited		Not limited	
Urban land	Not rated		Not rated	
CwA:				
Chewacla	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Dwellings—Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements	
	Rating class and limiting features	Value	Rating class and limiting features	Value
DAM:				
Dam	Not rated		Not rated	
HaB:				
Hard Labor	Not limited		Somewhat limited	
			Depth to saturated zone	0.97
HzB:				
Helena	Somewhat limited		Very limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00
	Depth to saturated zone	0.39	Shrink-swell	0.50
HzC:				
Helena	Somewhat limited		Very limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00
	Depth to saturated zone	0.39	Shrink-swell	0.50
	Slope	0.01	Slope	0.01
LdB:				
Lloyd	Not limited		Not limited	
LfB3:				
Lloyd	Not limited		Not limited	
LfD3:				
Lloyd	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
MaB2:				
Madison	Not limited		Not limited	
MaD2:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
MaE2:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
MdB3:				
Madison	Not limited		Not limited	
MdD3:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
MdE3:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
MsD:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
Bethlehem	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
			Depth to soft bedrock	0.01

Dwellings—Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MsE:				
Madison	Very limited Slope	 1.00	Very limited Slope	 1.00
Bethlehem	Very limited Slope	 1.00	Very limited Slope Depth to soft bedrock	 1.00 0.01
PaB:				
Pacolet	Not limited		Not limited	
PaD2:				
Pacolet	Somewhat limited Slope	 0.37	Somewhat limited Slope	 0.37
PaE2:				
Pacolet	Very limited Slope	 1.00	Very limited Slope	 1.00
PfB3:				
Pacolet	Not limited		Not limited	
PfD3:				
Pacolet	Somewhat limited Slope	 0.37	Somewhat limited Slope	 0.37
PfE3:				
Pacolet	Very limited Slope	 1.00	Very limited Slope	 1.00
PsD:				
Pacolet	Somewhat limited Slope	 0.37	Somewhat limited Slope	 0.37
Saw	Somewhat limited Slope Depth to hard bedrock	 0.37 0.29	Very limited Depth to hard bedrock Slope	 1.00 0.37
PsE:				
Pacolet	Very limited Slope	 1.00	Very limited Slope	 1.00
Saw	Very limited Slope Depth to hard bedrock	 1.00 0.29	Very limited Slope Depth to hard bedrock	 1.00 1.00
PtF:				
Pacolet	Very limited Slope	 1.00	Very limited Slope	 1.00
Towaliga	Very limited Slope	 1.00	Very limited Slope	 1.00

Dwellings—Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Tussahaw	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Large stones content	0.99	Large stones content	0.99
			Depth to hard bedrock	0.99
			Depth to soft bedrock	0.74
PuE:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
Urban land	Not rated		Not rated	
RoC:				
Rock outcrop	Not rated		Not rated	
ToA:				
Toccoa	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
			Depth to saturated zone	0.53
Ua:				
Urban land	Not rated		Not rated	
Ud:				
Udorthents	Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50
WeA:				
Wehadkee	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
WkA:				
Wehadkee	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
WyD:				
Wynott	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
			Depth to soft bedrock	0.03
Wilkes	Somewhat limited		Very limited	
	Shrink-swell	0.50	Depth to soft bedrock	1.00
	Depth to soft bedrock	0.50	Depth to hard bedrock	0.84
	Slope	0.37	Shrink-swell	0.50
			Slope	0.37
Winnsboro	Very limited		Very limited	
	Shrink-swell	1.00	Shrink-swell	1.00
	Slope	0.37	Slope	0.37

Dwellings—Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements	
	Rating class and limiting features	Value	Rating class and limiting features	Value
WyE:				
Wynott	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Depth to soft bedrock	0.03
Wilkes	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to soft bedrock	1.00
	Depth to soft bedrock	0.50	Depth to hard bedrock	0.84
			Shrink-swell	0.50
Winnsboro	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Shrink-swell	1.00	Shrink-swell	1.00

Roads and Streets and Shallow Excavations

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
ArC:				
Ashlar	Somewhat limited		Very limited	
	Depth to hard bedrock	0.84	Depth to hard bedrock	1.00
			Cutbanks cave	1.00
Rock outcrop	Not Rated		Not rated	
Wake	Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
			Cutbanks cave	0.10
AwE:				
Ashlar	Very limited		Very limited	
	Slope	1.00	Depth to hard bedrock	1.00
	Depth to hard bedrock	0.84	Slope	1.00
			Cutbanks cave	1.00
Wake	Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
	Slope	1.00	Slope	1.00
			Cutbanks cave	0.10
BwB:				
Buncombe	Very limited		Very limited	
	Flooding	1.00	Cutbanks cave	1.00
			Flooding	0.60
CaB:				
Cataula	Somewhat limited		Somewhat limited	
	Low strength	0.50	Depth to saturated zone	0.97
			Dense layer	0.50
			Too clayey	0.28
			Cutbanks cave	0.10
CeB:				
Cecil	Somewhat limited		Somewhat limited	
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
CeC2:				
Cecil	Somewhat limited		Somewhat limited	
	Low strength	0.50	Too clayey	0.28
	Slope	0.01	Cutbanks cave	0.10
			Slope	0.01
CfB2:				
Cecil	Somewhat limited		Somewhat limited	
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10

Roads and Streets and Shallow Excavations—Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
CfC3:				
Cecil	Somewhat limited		Somewhat limited	
	Low strength	0.50	Too clayey	0.28
	Slope	0.01	Cutbanks cave	0.10
			Slope	0.01
CuC:				
Cecil	Somewhat limited		Somewhat limited	
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
Urban land	Not Rated		Not rated	
CwA:				
Chewacla	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.80
	Low strength	1.00	Cutbanks cave	0.10
DAM:				
Dam	Not Rated		Not rated	
HaB:				
Hard Labor	Somewhat limited		Somewhat limited	
	Low strength	0.50	Depth to saturated zone	0.97
			Too clayey	0.12
			Cutbanks cave	0.10
HzB:				
Helena	Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50		
	Depth to saturated zone	0.19	Too clayey	0.28
			Cutbanks cave	0.10
HzC:				
Helena	Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50		
	Depth to saturated zone	0.19	Too clayey	0.28
			Cutbanks cave	0.10
	Slope	0.01	Slope	0.01
LdB:				
Lloyd	Somewhat limited		Somewhat limited	
	Low strength	0.50	Cutbanks cave	0.10
			Too clayey	0.06
LfB3:				
Lloyd	Somewhat limited		Somewhat limited	
	Low strength	0.50	Cutbanks cave	0.10
			Too clayey	0.06
LfD3:				
Lloyd	Somewhat limited		Somewhat limited	
	Low strength	0.50	Slope	0.37
	Slope	0.37	Cutbanks cave	0.10
			Too clayey	0.06

Roads and Streets and Shallow Excavations—Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MaB2:				
Madison	Somewhat limited		Somewhat limited	
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
MaD2:				
Madison	Somewhat limited		Somewhat limited	
	Low strength	0.50	Slope	0.37
	Slope	0.37	Too clayey	0.28
			Cutbanks cave	0.10
MaE2:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
MdB3:				
Madison	Not limited		Somewhat limited	
			Too clayey	0.28
			Cutbanks cave	0.10
MdD3:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
			Too clayey	0.28
			Cutbanks cave	0.10
MdE3:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Too clayey	0.28
			Cutbanks cave	0.10
MsD:				
Madison	Somewhat limited		Somewhat limited	
	Low strength	0.50	Slope	0.37
	Slope	0.37	Too clayey	0.28
			Cutbanks cave	0.10
Bethlehem	Somewhat limited		Very limited	
	Low strength	0.50	Cutbanks cave	1.00
	Slope	0.37	Slope	0.37
			Too clayey	0.28
			Depth to soft bedrock	0.01
MsE:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
Bethlehem	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Low strength	0.50	Cutbanks cave	1.00
			Too clayey	0.28
			Depth to soft bedrock	0.01

Roads and Streets and Shallow Excavations—Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
PaB:				
Pacolet	Somewhat limited		Somewhat limited	
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
PaD2:				
Pacolet	Somewhat limited		Somewhat limited	
	Low strength	0.50	Slope	0.37
	Slope	0.37	Too clayey	0.28
			Cutbanks cave	0.10
PaE2:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
PfB3:				
Pacolet	Not limited		Somewhat limited	
			Too clayey	0.28
			Cutbanks cave	0.10
PfD3:				
Pacolet	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
			Too clayey	0.28
			Cutbanks cave	0.10
PfE3:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Too clayey	0.28
			Cutbanks cave	0.10
PsD:				
Pacolet	Somewhat limited		Somewhat limited	
	Low strength	0.50	Slope	0.37
	Slope	0.37	Too clayey	0.28
			Cutbanks cave	0.10
Saw	Somewhat limited		Very limited	
	Low strength	0.50	Depth to hard bedrock	1.00
	Slope	0.37	Slope	0.37
	Depth to hard bedrock	0.29	Too clayey	0.28
			Cutbanks cave	0.10
PsE:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
Saw	Very limited		Very limited	
	Slope	1.00	Depth to hard bedrock	1.00
	Low strength	0.50	Slope	1.00
	Depth to hard bedrock	0.29	Too clayey	0.28
			Cutbanks cave	0.10

Roads and Streets and Shallow Excavations—Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
PtF:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
Towaliga	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
			Slope	1.00
			Too clayey	0.06
Tussahaw	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Large stones content	0.99	Large stones content	0.99
			Depth to hard bedrock	0.99
			Depth to soft bedrock	0.74
			Cutbanks cave	0.10
PuE:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Low strength	0.50	Too clayey	0.28
			Cutbanks cave	0.10
Urban land	Not Rated		Not rated	
RoC:				
Rock outcrop	Not Rated		Not rated	
ToA:				
Toccoa	Very limited		Somewhat limited	
	Flooding	1.00	Flooding	0.80
			Depth to saturated zone	0.53
			Cutbanks cave	0.10
Ua:				
Urban land	Not Rated		Not rated	
Ud:				
Udorthents	Very limited		Somewhat limited	
	Low strength	1.00	Cutbanks cave	0.10
	Shrink-swell	0.50		
WeA:				
Wehadkee	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Cutbanks cave	1.00
	Low strength	1.00	Flooding	0.80
WkA:				
Wehadkee	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Cutbanks cave	1.00
	Low strength	1.00	Flooding	0.80

Roads and Streets and Shallow Excavations—Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
WyD:				
Wynott	Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37
			Cutbanks cave	0.10
			Depth to soft bedrock	0.03
Wilkes	Very limited		Very limited	
	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
	Low strength	1.00	Depth to hard bedrock	0.84
	Shrink-swell	0.50	Slope	0.37
	Slope	0.37	Cutbanks cave	0.10
Winnsboro	Very limited		Somewhat limited	
	Shrink-swell	1.00	Slope	0.37
	Low strength	1.00	Too clayey	0.28
	Slope	0.37	Cutbanks cave	0.10
WyE:				
Wynott	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Cutbanks cave	0.10
			Depth to soft bedrock	0.03
Wilkes	Very limited		Very limited	
	Slope	1.00	Depth to soft bedrock	1.00
	Depth to soft bedrock	1.00	Slope	1.00
	Low strength	1.00	Depth to hard bedrock	0.84
	Shrink-swell	0.50	Cutbanks cave	0.10
Winnsboro	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Shrink-swell	1.00	Too clayey	0.28
	Low strength	1.00	Cutbanks cave	0.10

Sewage Disposal

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
ArC:				
Ashlar	Very limited		Very limited	
	Slow water movement	1.00	Depth to hard bedrock	1.00
	Depth to bedrock	1.00	Seepage	1.00
			Slope	0.92
Rock outcrop	Not rated		Not rated	
Wake	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
			Seepage	1.00
			Slope	0.92
AwE:				
Ashlar	Very limited		Very limited	
	Slow water movement	1.00	Depth to hard bedrock	1.00
	Depth to bedrock	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
Wake	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Slope	1.00	Slope	1.00
			Seepage	1.00
BwB:				
Buncombe	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Seepage, bottom layer	1.00	Seepage	1.00
	Filtering capacity	1.00	Slope	0.08
CaB:				
Cataula	Very limited		Somewhat limited	
	Slow water movement	1.00	Seepage	0.50
	Depth to saturated zone	1.00	Slope	0.32
			Depth to saturated zone	0.01
CeB:				
Cecil	Somewhat limited		Somewhat limited	
	Slow water movement	0.50	Seepage	0.50
			Slope	0.32
CeC2:				
Cecil	Somewhat limited		Very limited	
	Slow water movement	0.50	Slope	1.00
	Slope	0.01	Seepage	0.50

Sewage Disposal—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
CfB2:				
Cecil	Somewhat limited		Somewhat limited	
	Slow water movement	0.50	Seepage	0.50
			Slope	0.32
CfC3:				
Cecil	Somewhat limited		Very limited	
	Slow water movement	0.50	Slope	1.00
			Seepage	0.50
	Slope	0.01		
CuC:				
Cecil	Somewhat limited		Somewhat limited	
	Slow water movement	0.50	Slope	0.92
			Seepage	0.50
Urban land	Not rated		Not rated	
CwA:				
Chewacla	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slow water movement	0.50	Seepage	0.50
DAM:				
Dam	Not rated		Not rated	
HaB:				
Hard Labor	Very limited		Somewhat limited	
	Slow water movement	1.00	Seepage	0.50
			Slope	0.32
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
HzB:				
Helena	Very limited		Somewhat limited	
	Slow water movement	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	1.00	Slope	0.32
HzC:				
Helena	Very limited		Very limited	
	Slow water movement	1.00	Slope	1.00
			Depth to saturated zone	0.75
	Depth to saturated zone	1.00		
	Slope	0.01		
LdB:				
Lloyd	Somewhat limited		Somewhat limited	
	Slow water movement	0.50	Seepage	0.50
			Slope	0.32
LfB3:				
Lloyd	Somewhat limited		Somewhat limited	
	Slow water movement	0.50	Seepage	0.50
			Slope	0.32

Sewage Disposal—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
LfD3:				
Lloyd	Somewhat limited		Very limited	
	Slow water movement	0.50	Slope	1.00
	Slope	0.37	Seepage	0.50
MaB2:				
Madison	Somewhat limited		Somewhat limited	
	Slow water movement	0.50	Seepage	0.50
			Slope	0.32
MaD2:				
Madison	Somewhat limited		Very limited	
	Slow water movement	0.50	Slope	1.00
	Slope	0.37	Seepage	0.50
MaE2:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	0.50
MdB3:				
Madison	Somewhat limited		Somewhat limited	
	Slow water movement	0.50	Seepage	0.50
			Slope	0.32
MdD3:				
Madison	Somewhat limited		Very limited	
	Slow water movement	0.50	Slope	1.00
	Slope	0.37	Seepage	0.50
MdE3:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	0.50
MsD:				
Madison	Somewhat limited		Very limited	
	Slow water movement	0.50	Slope	1.00
	Slope	0.37	Seepage	0.50
Bethlehem	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slow water movement	0.50	Slope	1.00
	Slope	0.37	Seepage	0.50
MsE:				
Madison	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	0.50

Sewage Disposal—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Bethlehem	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	0.50
PaB:				
Pacolet	Somewhat limited		Somewhat limited	
	Slow water movement	0.50	Seepage	0.50
			Slope	0.32
PaD2:				
Pacolet	Somewhat limited		Very limited	
	Slow water movement	0.50	Slope	1.00
	Slope	0.37	Seepage	0.50
PaE2:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	0.50
PfB3:				
Pacolet	Somewhat limited		Somewhat limited	
	Slow water movement	0.50	Seepage	0.50
			Slope	0.32
PfD3:				
Pacolet	Somewhat limited		Very limited	
	Slow water movement	0.50	Slope	1.00
	Slope	0.37	Seepage	0.50
PfE3:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	0.50
PsD:				
Pacolet	Somewhat limited		Very limited	
	Slow water movement	0.50	Slope	1.00
	Slope	0.37	Seepage	0.50
Saw	Very limited		Very limited	
	Slow water movement	1.00	Depth to hard bedrock	1.00
	Depth to bedrock	1.00	Slope	1.00
	Slope	0.37	Seepage	1.00
PsE:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	0.50

Sewage Disposal—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Saw	Very limited		Very limited	
	Slow water movement	1.00	Depth to hard bedrock	1.00
	Depth to bedrock	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
PtF:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	0.50
Towaliga	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	1.00
Tussahaw	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	1.00	Slope	1.00
	Large stones content	0.99	Large stones content	1.00
	Slow water movement	0.50	Depth to hard bedrock	0.99
			Seepage	0.50
PuE:				
Pacolet	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Slow water movement	0.50	Seepage	0.50
Urban land	Not rated		Not rated	
RoC:				
Rock outcrop	Not rated		Not rated	
ToA:				
Toccoa	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Seepage, bottom layer	1.00	Seepage	1.00
	Depth to saturated zone	0.97	Depth to saturated zone	0.52
Ua:				
Urban land	Not rated		Not rated	
Ud:				
Udorthents	Somewhat limited		Somewhat limited	
	Slow water movement	0.82	Slope	0.68
			Seepage	0.18

Sewage Disposal—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
WeA:				
Wehadkee	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Seepage, bottom layer	1.00	Depth to saturated zone	1.00
	Slow water movement	0.50		
WkA:				
Wehadkee	Very limited		Very limited	
	Flooding	1.00	Ponding	1.00
	Ponding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Seepage, bottom layer	1.00	Depth to saturated zone	1.00
	Slow water movement	0.50		
WyD:				
Wynott	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slow water movement	1.00	Slope	1.00
	Slope	0.37		
Wilkes	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	0.37	Slope	1.00
			Depth to hard bedrock	0.84
Winnsboro	Very limited		Very limited	
	Slow water movement	1.00	Slope	1.00
	Depth to bedrock	0.47	Depth to soft bedrock	0.05
	Slope	0.37		
WyE:				
Wynott	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	1.00	Slope	1.00
	Slow water movement	1.00		
Wilkes	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	1.00	Slope	1.00
			Depth to hard bedrock	0.84
Winnsboro	Very limited		Very limited	
	Slow water movement	1.00	Slope	1.00
	Slope	1.00	Depth to soft bedrock	0.05
	Depth to bedrock	0.47		

Source of Sand, Roadfill, and Topsoil

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Potential source of sand		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ArC:						
Ashlar	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Too sandy	0.00
	Bottom layer	0.00			Depth to bedrock	0.16
					Too acid	0.88
Rock outcrop	Not Rated		Not rated		Not Rated	
			Depth to bedrock	0.00		
Wake	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer	0.00			Too sandy	0.01
					Too acid	0.98
					Rock fragments	0.99
AwE:						
Ashlar	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
	Bottom layer	0.00	Slope	0.50	Too sandy	0.00
					Depth to bedrock	0.16
					Too acid	0.88
Wake	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
	Bottom layer	0.00	Slope	0.82	Depth to bedrock	0.00
					Too sandy	0.01
					Too acid	0.98
					Rock fragments	0.99
BwB:						
Buncombe	Fair		Good		Poor	
	Thickest layer	0.00			Too sandy	0.00
	Bottom layer	0.59			Too acid	0.88
CaB:						
Cataula	Poor		Fair		Poor	
	Thickest layer	0.00	Low strength	0.50	Too clayey	0.00
	Bottom layer	0.00	Wetness depth	0.99	Hard to reclaim (dense layer)	0.00
					Too acid	0.88
					Wetness depth	0.99
CeB:						
Cecil	Poor		Fair		Poor	
	Thickest layer	0.00	Low strength	0.50	Too clayey	0.00
	Bottom layer	0.00			Too acid	0.88
CeC2:						
Cecil	Poor		Fair		Poor	
	Thickest layer	0.00	Low strength	0.50	Too clayey	0.00
	Bottom layer	0.00			Too acid	0.88
CfB2, CfC3:						
Cecil	Poor		Fair		Poor	
	Thickest layer	0.00	Low strength	0.50	Too clayey	0.00
	Bottom layer	0.00			Too acid	0.88

Source of Sand, Roadfill, and Topsoil—Continued

Map symbol and soil name	Potential source of sand		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CuC:						
Cecil	Poor		Fair		Poor	
	Thickest layer	0.00	Low strength	0.50	Too clayey	0.00
	Bottom layer	0.00			Too acid	0.88
Urban land	Not Rated		Not rated		Not Rated	
CwA:						
Chewacla	Poor		Poor		Poor	
	Thickest layer	0.00	Wetness depth	0.00	Wetness depth	0.00
	Bottom layer	0.00	Low strength	0.99	Too clayey	0.81
DAM:						
Dam	Not Rated		Not rated		Not Rated	
HaB:						
Hard Labor	Poor		Fair		Poor	
	Thickest layer	0.00	Low strength	0.50	Too clayey	0.00
	Bottom layer	0.00	Wetness depth	0.99	Too acid	0.88
					Wetness depth	0.99
HzB, HzC:						
Helena	Poor		Poor		Poor	
	Thickest layer	0.00	Low strength	0.00	Too clayey	0.00
	Bottom layer	0.00	Wetness depth	0.53	Wetness depth	0.53
					Too acid	0.88
LdB:						
Lloyd	Poor		Fair		Poor	
	Thickest layer	0.00	Low strength	0.50	Too clayey	0.00
	Bottom layer	0.00				
LfB3:						
Lloyd	Poor		Fair		Poor	
	Thickest layer	0.00	Low strength	0.50	Too clayey	0.00
	Bottom layer	0.00				
LfD3:						
Lloyd	Poor		Fair		Poor	
	Thickest layer	0.00	Low strength	0.50	Too clayey	0.00
	Bottom layer	0.00			Slope	0.63
MaB2:						
Madison	Poor		Good		Poor	
	Thickest layer	0.00			Too clayey	0.00
	Bottom layer	0.00			Too acid	0.88
MaD2:						
Madison	Poor		Good		Poor	
	Thickest layer	0.00			Too clayey	0.00
	Bottom layer	0.00			Slope	0.63
					Too acid	0.88
MaE2:						
Madison	Poor		Fair		Poor	
	Thickest layer	0.00	Slope	0.08	Slope	0.00
	Bottom layer	0.00			Too clayey	0.00
					Too acid	0.88

Source of Sand, Roadfill, and Topsoil—Continued

Map symbol and soil name	Potential source of sand		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MdB3:						
Madison	Poor		Good		Fair	
	Thickest layer	0.00			Too clayey	0.55
	Bottom layer	0.00			Too acid	0.88
MdD3:						
Madison	Poor		Good		Fair	
	Thickest layer	0.00			Too clayey	0.55
	Bottom layer	0.00			Slope	0.63
					Too acid	0.88
MdE3:						
Madison	Poor		Fair		Poor	
	Thickest layer	0.00	Slope	0.08	Slope	0.00
	Bottom layer	0.00			Too clayey	0.55
					Too acid	0.88
MsD:						
Madison	Poor		Good		Poor	
	Thickest layer	0.00			Too clayey	0.00
	Bottom layer	0.00			Slope	0.63
					Too acid	0.88
Bethlehem	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Too clayey	0.00
	Bottom layer	0.00	Low strength	0.50	Rock fragments	0.50
					Slope	0.63
					Too acid	0.88
					Depth to bedrock	0.99
MsE:						
Madison	Poor		Fair		Poor	
	Thickest layer	0.00	Slope	0.08	Slope	0.00
	Bottom layer	0.00			Too clayey	0.00
					Too acid	0.88
Bethlehem	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
	Bottom layer	0.00	Slope	0.08	Too clayey	0.00
			Low strength	0.50	Rock fragments	0.50
					Too acid	0.88
					Depth to bedrock	0.99
PaB:						
Pacolet	Poor		Good		Poor	
	Thickest layer	0.00			Too clayey	0.00
	Bottom layer	0.00			Too acid	0.88
PaD2:						
Pacolet	Poor		Good		Poor	
	Thickest layer	0.00			Too clayey	0.00
	Bottom layer	0.00			Slope	0.63
					Too acid	0.88
PaE2:						
Pacolet	Poor		Fair		Poor	
	Thickest layer	0.00	Slope	0.50	Slope	0.00
	Bottom layer	0.00			Too clayey	0.00
					Too acid	0.88

Source of Sand, Roadfill, and Topsoil—Continued

Map symbol and soil name	Potential source of sand		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PfB3:						
Pacolet	Poor		Good		Poor	
	Thickest layer	0.00			Too clayey	0.00
	Bottom layer	0.00			Too acid	0.88
PfD3:						
Pacolet	Poor		Good		Poor	
	Thickest layer	0.00			Too clayey	0.00
	Bottom layer	0.00			Slope	0.63
					Too acid	0.88
PfE3:						
Pacolet	Poor		Fair		Poor	
	Thickest layer	0.00	Slope	0.50	Slope	0.00
	Bottom layer	0.00			Too clayey	0.00
					Too acid	0.88
PsD:						
Pacolet	Poor		Good		Poor	
	Thickest layer	0.00			Too clayey	0.00
	Bottom layer	0.00			Slope	0.63
					Too acid	0.88
Saw	Poor		Poor		Poor	
	Bottom layer	0.00	Depth to bedrock	0.00	Too clayey	0.00
	Thickest layer	0.00	Low strength	0.50	Slope	0.63
					Depth to bedrock	0.71
					Too acid	0.88
PsE:						
Pacolet	Poor		Fair		Poor	
	Thickest layer	0.00	Slope	0.50	Slope	0.00
	Bottom layer	0.00			Too clayey	0.00
					Too acid	0.88
Saw	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
	Bottom layer	0.00	Slope	0.50	Too clayey	0.00
			Low strength	0.50	Depth to bedrock	0.71
					Too acid	0.88
PtF:						
Pacolet	Poor		Poor		Poor	
	Thickest layer	0.00	Slope	0.00	Too clayey	0.00
	Bottom layer	0.00			Slope	0.00
					Too acid	0.88
Towaliga	Poor		Poor		Poor	
	Thickest layer	0.00	Slope	0.00	Rock fragments	0.00
	Bottom layer	0.00			Slope	0.00
					Too acid	0.88
Tussahaw	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Rock fragments	0.00
	Bottom layer	0.00	Slope	0.00	Slope	0.00
			Cobble content	0.02	Depth to bedrock	0.26
					Too clayey	0.35
					Too acid	0.88

Source of Sand, Roadfill, and Topsoil—Continued

Map symbol and soil name	Potential source of sand		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PuE:						
Pacolet	Poor		Fair		Poor	
	Thickest layer	0.00	Slope	0.82	Too clayey	0.00
	Bottom layer	0.00			Slope	0.00
					Too acid	0.88
Urban land	Not Rated		Not rated		Not Rated	
			Slope	0.82		
RoC:						
Rock outcrop	Not Rated		Not rated		Not Rated	
			Depth to bedrock	0.00		
ToA:						
Toccoa	Poor		Good		Good	
	Thickest layer	0.00				
	Bottom layer	0.00				
Ua:						
Urban land	Not Rated		Not rated		Not Rated	
Ud:						
Udorthents	Poor		Poor		Fair	
	Thickest layer	0.00	Low strength	0.00	Too clayey	0.39
	Bottom layer	0.00	Shrink-swell	0.87		
WeA:						
Wehadkee	Poor		Poor		Poor	
	Thickest layer	0.00	Wetness depth	0.00	Wetness depth	0.00
	Bottom layer	0.00			Too clayey	0.47
					Too acid	0.88
WkA:						
Wehadkee	Poor		Poor		Poor	
	Thickest layer	0.00	Wetness depth	0.00	Wetness depth	0.00
	Bottom layer	0.00			Too clayey	0.47
					Too acid	0.88
WyD:						
Wynott	Poor		Poor		Fair	
	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.63
	Bottom layer	0.00			Depth to bedrock	0.97
					Rock fragments	0.99
Wilkes	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
	Bottom layer	0.00	Low strength	0.00	Too clayey	0.09
			Shrink-swell	0.87	Slope	0.63
					Rock fragments	0.99
Winnsboro	Poor		Fair		Poor	
	Thickest layer	0.00	Depth to bedrock	0.95	Too clayey	0.00
	Bottom layer	0.00	Shrink-swell	0.98	Slope	0.63

Source of Sand, Roadfill, and Topsoil—Continued

Map symbol and soil name	Potential source of sand		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WyE:						
Wynott	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
	Bottom layer	0.00	Slope	0.08	Depth to bedrock	0.97
					Rock fragments	0.99
Wilkes	Poor		Poor		Poor	
	Thickest layer	0.00	Depth to bedrock	0.00	Slope	0.00
	Bottom layer	0.00	Low strength	0.00	Depth to bedrock	0.00
			Slope	0.08	Too clayey	0.09
			Shrink-swell	0.87	Rock fragments	0.99
Winnsboro	Poor		Fair		Poor	
	Thickest layer	0.00	Slope	0.08	Slope	0.00
	Bottom layer	0.00	Depth to bedrock	0.95	Too clayey	0.00
			Shrink-swell	0.98		

Ponds and Embankments

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pond reservoir areas		Embankments, dikes and levees	
	Rating class and limiting features	Value	Rating class and limiting features	Value
ArC:				
Ashlar	Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	0.96
	Depth to bedrock	0.96	Seepage	0.21
Rock outcrop	Very limited		Not rated	
	Depth to bedrock	1.00		
Wake	Very limited		Very limited	
	Depth to bedrock	1.00	Thin layer	1.00
			Seepage	0.10
AwE:				
Ashlar	Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	0.96
	Depth to bedrock	0.96	Seepage	0.21
	Slope	0.77		
Wake	Very limited		Very limited	
	Depth to bedrock	1.00	Thin layer	1.00
	Slope	0.56	Seepage	0.10
BwB:				
Buncombe	Very limited		Somewhat limited	
	Seepage	1.00	Seepage	0.34
CaB:				
Cataula	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.85
			Depth to saturated zone	0.53
CeB:				
Cecil	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.93
CeC2:				
Cecil	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.93
CfB2, CfC3:				
Cecil	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.70
CuC:				
Cecil	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.93
Urban land	Not limited		Not rated	
CwA:				
Chewacla	Somewhat limited		Very limited	
	Seepage	0.70	Depth to saturated zone	1.00
			Piping	0.05

Ponds and Embankments—Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes and levees	
	Rating class and limiting features	Value	Rating class and limiting features	Value
DAM:				
Dam	Not Rated		Not rated	
HaB:				
Hard Labor	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.70
			Depth to saturated zone	0.53
HzB, HzC:				
Helena	Somewhat limited		Very limited	
	Seepage	0.05	Depth to saturated zone	0.99
			Piping	0.66
			Seepage	0.03
LdB:				
Lloyd	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.75
LfB3:				
Lloyd	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.80
LfD3:				
Lloyd	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.80
	Slope	0.01		
MaB2:				
Madison	Somewhat limited		Somewhat limited	
	Seepage	0.70	Seepage	0.04
MaD2:				
Madison	Somewhat limited		Somewhat limited	
	Seepage	0.70	Seepage	0.04
	Slope	0.01		
MaE2:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.96	Seepage	0.04
	Seepage	0.70		
MdB3:				
Madison	Somewhat limited		Somewhat limited	
	Seepage	0.70	Seepage	0.03
MdD3:				
Madison	Somewhat limited		Somewhat limited	
	Seepage	0.70	Seepage	0.03
	Slope	0.01		
MdE3:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.96	Seepage	0.03
	Seepage	0.70		
MsD:				
Madison	Somewhat limited		Somewhat limited	
	Seepage	0.70	Seepage	0.04
	Slope	0.01		

Ponds and Embankments—Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes and levees	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Bethlehem	Somewhat limited		Somewhat limited	
	Seepage	0.70	Thin layer	0.56
	Depth to bedrock	0.02		
	Slope	0.01		
MsE:				
Madison	Somewhat limited		Somewhat limited	
	Slope	0.96	Seepage	0.04
	Seepage	0.70		
Bethlehem	Somewhat limited		Somewhat limited	
	Slope	0.96	Thin layer	0.56
	Seepage	0.70		
	Depth to bedrock	0.02		
PaB:				
Pacolet	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.98
			Seepage	0.03
PaD2:				
Pacolet	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.98
	Slope	0.01	Seepage	0.03
PaE2:				
Pacolet	Somewhat limited		Somewhat limited	
	Slope	0.77	Piping	0.98
	Seepage	0.70	Seepage	0.03
PfB3:				
Pacolet	Somewhat limited		Somewhat limited	
	Seepage	0.70	Seepage	0.03
PfD3:				
Pacolet	Somewhat limited		Somewhat limited	
	Seepage	0.70	Seepage	0.03
	Slope	0.01		
PfE3:				
Pacolet	Somewhat limited		Somewhat limited	
	Slope	0.77	Seepage	0.03
	Seepage	0.70		
PsD:				
Pacolet	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.98
	Slope	0.01	Seepage	0.03
Saw	Very limited		Somewhat limited	
	Seepage	1.00	Piping	0.89
	Depth to bedrock	0.81	Thin layer	0.81
	Slope	0.01		
PsE:				
Pacolet	Somewhat limited		Somewhat limited	
	Slope	0.77	Piping	0.98
	Seepage	0.70	Seepage	0.03

Ponds and Embankments—Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes and levees	
	Rating class and limiting features	Value	Rating class and limiting features	Value
Saw	Very limited		Somewhat limited	
	Seepage	1.00	Piping	0.89
	Depth to bedrock	0.81	Thin layer	0.81
	Slope	0.77		
PtF:				
Pacolet	Very limited		Somewhat limited	
	Slope	0.99	Piping	0.98
	Seepage	0.70	Seepage	0.03
Towaliga	Very limited		Somewhat limited	
	Seepage	1.00	Seepage	0.03
	Slope	0.99		
Tussahaw	Very limited		Very limited	
	Slope	0.99	Large stones content	0.99
	Seepage	0.70		
	Depth to bedrock	0.44	Thin layer	0.94
PuE:				
Pacolet	Somewhat limited		Somewhat limited	
	Seepage	0.70	Piping	0.98
	Slope	0.56	Seepage	0.03
Urban land	Somewhat limited		Not rated	
	Slope	0.56		
RoC:				
Rock outcrop	Not Rated		Not rated	
ToA:				
Toccoa	Very limited		Very limited	
	Seepage	1.00	Piping	1.00
			Seepage	0.03
Ua:				
Urban land	Not Rated		Not rated	
Ud:				
Udorthents	Somewhat limited		Not limited	
	Seepage	0.43		
WeA:				
Wehadkee	Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00
			Piping	0.93
			Seepage	0.10
WkA:				
Wehadkee	Very limited		Very limited	
	Seepage	1.00	Ponding	1.00
			Depth to saturated zone	1.00
			Piping	0.93
			Seepage	0.10

Ponds and Embankments—Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes and levees	
	Rating class and limiting features	Value	Rating class and limiting features	Value
WyD:				
Wynott	Somewhat limited		Somewhat limited	
	Seepage	0.05	Thin layer	0.61
	Depth to bedrock	0.02	Seepage	0.04
	Slope	0.01		
Wilkes	Somewhat limited		Very limited	
	Depth to bedrock	0.53	Thin layer	1.00
	Slope	0.01		
Winnsboro	Somewhat limited		Somewhat limited	
	Seepage	0.05	Thin layer	0.01
	Slope	0.01		
	Depth to bedrock	0.01		
WyE:				
Wynott	Somewhat limited		Somewhat limited	
	Slope	0.96	Thin layer	0.61
	Seepage	0.05	Seepage	0.04
	Depth to bedrock	0.02		
Wilkes	Somewhat limited		Very limited	
	Slope	0.96	Thin layer	1.00
	Depth to bedrock	0.53		
Winnsboro	Somewhat limited		Somewhat limited	
	Slope	0.96	Thin layer	0.01
	Seepage	0.05		
	Depth to bedrock	0.01		

Engineering Soil Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
ArC:												
Ashlar----------	0-7	Coarse sandy loam, sandy loam	SC-SM, SM	A-2-4, A-4, A-1-b	0	0-2	84-100	76-100	46-70	23-40	17-28	2-10
	7-15	Coarse sandy loam, sandy loam	SC-SM, SM	A-2-4, A-4, A-1-b	0	0-2	88-100	83-100	50-70	25-40	16-27	2-10
	15-25	Coarse sandy loam, loamy coarse sand	SM, SC-SM	A-2-4, A-4, A-1-b	0	0-2	92-100	84-100	42-75	4-40	16-27	2-10
	>25	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Bedrock			---	---	---	---	---	---	---	---
Wake----------	0-4	Loamy sand	SC-SM, SM	A-2-4, A-4, A-1-b	0-2	0-2	85-100	78-100	39-75	12-40	0-15	NP-7
	4-14	Loamy sand, sandy loam, coarse sandy loam	SC-SM, SM	A-2-4, A-4, A-1-b	0-2	0-2	85-100	78-100	39-75	12-40	0-15	NP-7
	>14	Bedrock			---	---	---	---	---	---	---	---
AwE:												
Ashlar----------	0-7	Coarse sandy loam, sandy loam	SC-SM, SM	A-1-b, A-2-4, A-4	0	0-2	84-100	76-100	46-70	23-40	17-28	2-10
	7-15	Coarse sandy loam, sandy loam	SC-SM, SM	A-1-b, A-2-4, A-4	0	0-2	88-100	83-100	50-70	25-40	16-27	2-10
	15-25	Coarse sandy loam, loamy coarse sand	SM, SC-SM	A-2-4, A-4, A-1-b	0	0-2	92-100	84-100	42-75	4-40	16-27	2-10
	>25	Bedrock			---	---	---	---	---	---	---	---
Wake----------	0-4	Loamy sand	SC-SM, SM	A-1-b, A-2-4, A-4	0-2	0-2	85-100	78-100	39-75	12-40	0-15	NP-7
	4-14	Loamy sand, sandy loam, coarse sandy loam	SC-SM, SM	A-2-4, A-4, A-1-b	0-2	0-2	85-100	78-100	39-75	12-40	0-15	NP-7
	>14	Bedrock			---	---	---	---	---	---	---	---

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BwB:												
Buncombe--------	0-10	Loamy sand, sand	SM, SC-SM	A-2-4, A-3	0	0	98-100	98-100	50-75	9-30	0-15	NP-7
	10-60	Sand, loamy sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0	98-100	98-100	50-75	5-30	0-15	NP-7
CaB:												
Cataula---------	0-4	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	96-100	92-100	55-70	28-40	17-35	1-6
	4-7	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	96-100	92-100	55-70	28-40	16-32	1-6
	7-23	Clay, sandy clay	MH, ML	A-7-6	0	0	98-100	95-100	81-100	43-95	42-66	13-22
	23-30	Clay, sandy clay	MH, ML	A-7-6	0	0	98-100	95-100	81-100	43-95	42-66	13-22
	30-40	Clay, sandy clay	MH, ML	A-7-6	0	0	98-100	96-100	82-100	43-95	42-66	13-22
	40-52	Clay loam, sandy clay, sandy clay loam	SC-SM, ML	A-7-6, A-2-6, A-6	0	0	98-100	95-100	86-100	33-80	29-49	6-14
	52-60	Sandy clay loam, sandy loam	SM, SC-SM	A-7-6, A-6, A-2-4	0	0	98-100	95-100	57-90	29-55	16-44	1-13
CeB:												
Cecil-----------	0-8	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0-5	90-100	84-100	50-70	25-40	17-35	1-6
	8-11	Sandy clay loam, clay loam	SC-SM, ML	A-6, A-7-6, A-2-6	0	0-5	95-100	92-100	74-100	32-80	29-49	6-14
	11-37	Sandy clay, clay	MH, ML	A-7-6	0	0-5	95-100	91-100	77-100	41-95	42-66	13-22
	37-48	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-5	95-100	92-100	74-90	32-55	29-44	6-13
	48-60	Sandy clay loam, sandy loam	SM, SC-SM	A-7-6, A-2-4, A-6	0-1	0-5	95-100	92-100	55-90	28-55	16-44	1-13

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CeC2:												
Cecil	0-8	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0-5	90-100	84-100	50-70	25-40	17-35	1-6
	8-11	Sandy clay loam, clay loam	SC-SM, ML	A-6, A-7-6, A-2-6	0	0-5	95-100	92-100	74-100	32-80	29-49	6-14
	11-37	Sandy clay, clay	MH, ML	A-7-6	0	0-5	95-100	91-100	77-100	41-95	42-66	13-22
	37-48	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-5	95-100	92-100	74-90	32-55	29-44	6-13
	48-60	Sandy clay loam, sandy loam	SM, SC-SM	A-2-4, A-4, A-6	0-1	0-5	95-100	92-100	55-90	28-55	16-44	1-13
CfB2:												
Cecil	0-4	Sandy clay loam	SC-SM	A-6, A-2-6, A-7-6	0	0-5	90-100	84-100	67-90	29-55	30-47	6-13
	4-43	Clay, sandy clay	MH, ML	A-7-6	0	0-5	95-100	91-100	77-100	41-95	42-66	13-22
	43-50	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-2	95-100	92-100	74-90	32-55	29-44	6-13
	50-60	Sandy clay loam, sandy loam	SC-SM, SM	A-6, A-4, A-2-4	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13
CfC3:												
Cecil	0-4	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0	0-5	90-100	84-100	67-90	29-55	30-47	6-13
	4-43	Clay, sandy clay	MH, ML	A-7-6	0	0-5	95-100	91-100	77-100	41-95	42-66	13-22
	43-50	Sandy clay loam	SC-SM	A-6, A-2-6, A-7-6	0-1	0-2	95-100	92-100	74-90	32-55	29-44	6-13
	50-60	Sandy clay loam, sandy loam	SC-SM, SM	A-6, A-2-4, A-7-6	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CuC:												
Cecil	0-8	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0-5	90-100	84-100	50-70	25-40	17-35	1-6
	8-11	Sandy clay loam, clay loam	SC-SM, ML	A-6, A-7-6, A-2-6	0	0-5	95-100	92-100	74-100	32-80	29-49	6-14
	11-37	Sandy clay, clay	MH, ML	A-7-6	0	0-5	95-100	91-100	77-100	41-95	42-66	13-22
	37-48	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-5	95-100	92-100	74-90	32-55	29-44	6-13
	48-60	Sandy clay loam, sandy loam	SM, SC-SM	A-2-4, A-6, A-7-6	0-1	0-5	95-100	92-100	55-90	28-55	16-44	1-13
Urban land	---	---	---	---	---	---	---	---	---	---	---	---
CwA:												
Chewacla	0-6	Loam	CL, CL-ML	A-4	0	0	98-100	97-100	82-95	58-75	20-45	3-18
	6-25	Clay loam, sandy clay loam, silty clay loam, loam	CL, CL-ML, SM, SC-SM, SC	A-4, A-6, A-7-6	0	0	98-100	97-100	78-100	34-95	19-52	3-28
	25-30	Clay loam, sandy clay loam, loam	CL, CL-ML, SC, SC-SM, SM	A-4, A-6	0	0	98-100	97-100	78-100	34-95	19-47	3-24
	30-40	Sandy clay loam, clay loam	CL, CL-ML, SC, SC-SM, SM	A-4, A-6, A-2-4	0	0	98-100	97-100	49-100	15-95	17-52	2-28
	40-60	Sandy clay loam, sandy clay, clay, sandy loam, loamy sand, silty clay, silty clay loam	CL, CL-ML, SC, SC-SM, SM	A-2-4, A-2-5, A-2-7, A-2-6, A-6, A-7-6	0	0	98-100	97-100	92-100	15-95	16-66	2-43
DAM:												
Dam	---	---	---	---	---	---	---	---	---	---	---	---

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HaB:												
Hard Labor------	0-9	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0-8	97-100	92-100	55-70	28-40	17-47	1-6
	9-15	Sandy clay loam, sandy loam	SC-SM, SM	A-6, A-4, A-2-4	0	0-8	97-100	92-100	55-90	28-55	16-45	1-13
	15-36	Sandy clay, clay	MH, ML	A-7-6	0	0-8	95-100	91-100	77-100	41-95	42-66	13-22
	36-50	Clay, sandy clay	MH, ML	A-7-6	0	0-8	95-100	91-100	77-100	41-95	42-66	13-22
	50-60	Sandy clay, sandy clay loam	SC-SM	A-6, A-7-6	0	0-8	95-100	92-100	78-95	32-60	29-61	6-21
HzB:												
Helena----------	0-8	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0-3	90-100	84-100	50-70	25-40	17-35	1-8
	8-11	Sandy loam	SM, SC-SM	A-2-4, A-4	0	0-3	90-100	84-100	50-70	25-40	16-32	1-8
	11-30	Sandy clay, clay	MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	50-75	16-28
	30-35	Sandy clay, clay	MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	50-75	16-28
	35-45	Sandy clay loam, clay loam	SC, CL, ML	A-7-6, A-6	0	0-3	95-100	92-100	74-100	32-80	29-49	8-18
	45-60	Sandy loam, loam, sandy clay loam	SC-SM, SM, SC, CL-ML, CL, ML	A-2-4, A-7-6, A-4, A-6	0	0-3	95-100	88-100	55-95	25-75	16-44	1-18
HzC:												
Helena----------	0-8	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0-3	90-100	84-100	50-70	25-40	17-35	1-8
	8-11	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0-3	90-100	84-100	50-70	25-40	16-32	1-8
	11-30	Sandy clay, clay	MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	50-75	16-28
	30-35	Sandy clay, clay	MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	50-75	16-28
	35-45	Sandy clay loam, clay loam	SC, CL, ML	A-7-6, A-6	0	0-3	95-100	92-100	74-100	32-80	29-49	8-18
	45-60	Sandy loam, loam, sandy clay loam	SC-SM, SM, SC, CL-ML, CL, ML	A-2-4, A-7-6, A-4, A-6	0	0-3	95-100	88-100	55-95	25-75	16-44	1-18

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LdB:												
Lloyd	0-10	Sandy loam	SM, SC-SM	A-4, A-2-4	0	0-5	90-100	84-100	50-70	25-40	17-35	1-6
	10-55	Clay, sandy clay, clay loam	ML	A-7-6	0	0-5	95-100	91-100	77-100	41-95	35-66	9-22
	55-60	Sandy clay loam, clay loam	ML, SC-SM	A-2-6, A-6, A-7-6	0	0-5	95-100	92-100	74-100	32-80	29-49	6-14
LfB3:												
Lloyd	0-4	Sandy clay loam	SC-SM	A-7-6, A-6, A-2-6	0	0-5	90-100	84-100	67-90	29-55	30-47	6-13
	4-35	Clay, sandy clay, clay loam	ML	A-7-6	0	0-5	95-100	91-100	77-100	41-95	35-66	9-22
	35-59	Sandy clay loam, clay loam	SC-SM, ML	A-2-6, A-6, A-7-6	0	0-5	95-100	92-100	74-100	32-80	29-49	6-14
	59-60	Sandy clay loam, sandy loam	CL, ML, SC-SM, SM, CL-ML	A-4, A-6, A-7-6	0	0-5	90-100	85-99	60-90	36-70	18-44	4-20
LfD3:												
Lloyd	0-4	Sandy clay loam	SC-SM	A-7-6, A-6, A-2-6	0	0-5	90-100	84-100	67-90	29-55	30-47	6-13
	4-35	Clay, sandy clay, clay loam	ML	A-7-6	0	0-5	95-100	91-100	77-100	41-95	35-66	9-22
	35-59	Sandy clay loam, clay loam	SC-SM, ML	A-2-6, A-6, A-7-6	0	0-5	95-100	92-100	74-100	32-80	29-49	6-14
	59-60	Sandy clay loam, sandy loam	CL, ML, SC-SM, SM, CL-ML	A-4, A-6, A-7-6	0	0-5	90-100	85-99	60-90	36-70	18-44	4-20

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MaB2:												
Madison	0-5	Sandy loam	SM, SC-SM	A-2-4, A-4	0	0-3	90-100	84-100	50-70	25-40	17-35	1-6
	5-24	Sandy clay, clay	ML, CL, MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	42-66	15-24
	24-38	Sandy clay loam	SC-SM	A-2-6, A-6, A-7-6	0	0-3	95-100	92-100	74-90	32-55	29-44	6-13
	38-50	Sandy clay loam, sandy loam	SC-SM, SM	A-7-6, A-6, A-2-4	0	0-3	95-100	92-100	74-90	28-55	16-44	1-13
	50-60	Sandy loam, sandy clay loam	SM, SC-SM	A-2-4	0	0-3	95-100	92-100	55-70	28-40	16-31	1-6
MaD2:												
Madison	0-5	Sandy loam	SM, SC-SM	A-2-4, A-4	0	0-3	90-100	84-100	50-70	25-40	17-35	1-6
	5-24	Sandy clay, clay	ML, CL, MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	42-66	15-24
	24-38	Sandy clay loam	SC-SM	A-2-6, A-6, A-7-6	0	0-3	95-100	92-100	74-90	32-55	29-44	6-13
	38-50	Sandy clay loam, sandy loam	SC-SM, SM	A-7-6, A-6, A-2-4	0	0-3	95-100	92-100	74-90	28-55	16-44	1-13
	50-60	Sandy loam, sandy clay loam	SM, SC-SM	A-2-4	0	0-3	95-100	92-100	55-70	28-40	16-31	1-6
MaE2:												
Madison	0-5	Sandy loam	SM, SC-SM	A-2-4, A-4	0	0-3	90-100	84-100	50-70	25-40	17-35	1-6
	5-24	Sandy clay, clay	ML, CL, MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	42-66	15-24
	24-38	Sandy clay loam	SC-SM	A-2-6, A-6, A-7-6	0	0-3	95-100	92-100	74-90	32-55	29-44	6-13
	38-50	Sandy clay loam, sandy loam	SC-SM, SM	A-7-6, A-6, A-2-4	0	0-3	95-100	92-100	74-90	28-55	16-44	1-13
	50-60	Sandy loam, sandy clay loam	SM, SC-SM	A-2-4	0	0-3	95-100	92-100	55-70	28-40	16-31	1-6

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MdB3:												
Madison---------	0-4	Sandy clay loam	SC-SM	A-7-6, A-6, A-2-6	0	0-3	90-100	85-100	67-90	29-55	30-47	6-13
	4-20	Clay, sandy clay	ML, CL, MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	42-66	15-24
	20-45	Sandy clay loam	SC-SM	A-7-6, A-2-6, A-6	0	0-3	95-100	92-100	74-90	32-55	29-44	6-13
	45-60	Sandy loam, sandy clay loam	SC-SM, SM	A-4, A-7-6, A-2-4	0	0-3	95-100	92-100	74-90	28-55	16-44	1-13
MdD3:												
Madison---------	0-4	Sandy clay loam	SC-SM	A-2-6, A-6, A-7-6	0	0-3	90-100	85-100	67-90	29-55	30-47	6-13
	4-20	Clay, sandy clay	ML, CL, MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	42-66	15-24
	20-45	Sandy clay loam	SC-SM	A-7-6, A-2-6, A-6	0	0-3	95-100	92-100	74-90	32-55	29-44	6-13
	45-60	Sandy loam, sandy clay loam	SC-SM, SM	A-2-4, A-4, A-7-6	0	0-3	95-100	92-100	74-90	28-55	16-44	1-13
MdE3:												
Madison---------	0-4	Sandy clay loam	SC-SM	A-2-6, A-6, A-7-6	0	0-3	90-100	85-100	67-90	29-55	30-47	6-13
	4-20	Clay, sandy clay	ML, CL, MH	A-7-6	0	0-3	95-100	91-100	77-100	41-95	42-66	15-24
	20-45	Sandy clay loam	SC-SM	A-7-6, A-2-6, A-6	0	0-3	95-100	92-100	74-90	32-55	29-44	6-13
	45-60	Sandy loam, sandy clay loam	SC-SM, SM	A-2-4, A-4, A-7-6	0	0-3	95-100	92-100	74-90	28-55	16-44	1-13
MsD:												
Madison---------	0-5	Sandy loam	SM, SC-SM	A-2-4, A-4	0	0-3	90-100	84-100	50-70	25-40	17-35	1-6
	5-24	Sandy clay, clay	MH, ML, CL	A-7-6	0	0-3	95-100	91-100	77-100	41-95	42-66	15-24
	24-38	Sandy clay loam	SC-SM	A-7-6, A-2-6, A-6	0	0-3	95-100	92-100	74-90	32-55	29-44	6-13
	38-50	Sandy clay loam, sandy loam	SC-SM, SM	A-7-6, A-6, A-2-4	0	0-3	95-100	92-100	74-90	28-55	16-44	1-13
	50-60	Sandy loam, sandy clay loam	SM, SC-SM	A-2-4	0	0-3	95-100	92-100	55-70	28-40	16-31	1-6

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Bethlehem--------	0-8	Gravelly sandy loam	SM, SC-SM	A-1-b, A-2-4	0-2	0-7	65-100	51-100	31-70	15-40	17-35	NP-6
	8-12	Sandy clay loam	SC-SM	A-2-6, A-6	0	0	65-100	52-100	42-90	18-55	29-45	6-13
	12-33	Sandy clay, clay, clay loam	ML	A-7-5	0	0	65-100	51-100	43-100	23-95	42-66	9-22
	33-38	Gravelly sandy loam, very gravelly sandy loam, sandy loam	SM, SC-SM	A-2-4, A-1-a	0-2	0-12	55-85	43-76	26-53	13-30	16-31	NP-6
	38-60	Bedrock			---	---	---	---	---	---	---	---
MsE:												
Madison----------	0-5	Sandy loam	SM, SC-SM	A-2-4, A-4	0	0-3	90-100	84-100	50-70	25-40	17-35	1-6
	5-24	Sandy clay, clay	MH, CL, ML	A-7-6	0	0-3	95-100	91-100	77-100	41-95	42-66	15-24
	24-38	Sandy clay loam	SC-SM	A-2-6, A-6, A-7-6	0	0-3	95-100	92-100	74-90	32-55	29-44	6-13
	38-50	Sandy clay loam, sandy loam	SC-SM, SM	A-7-6, A-6, A-2-4	0	0-3	95-100	92-100	74-90	28-55	16-44	1-13
	50-60	Sandy loam, sandy clay loam	SM, SC-SM	A-2-4	0	0-3	95-100	92-100	55-70	28-40	16-31	1-6
Bethlehem--------	0-8	Gravelly sandy loam	SM, SC-SM	A-1-b, A-2-4	0-2	0-7	65-100	51-100	31-70	15-40	17-35	NP-6
	8-12	Sandy clay loam	SC-SM	A-2-6, A-6	0	0	65-100	52-100	42-90	18-55	29-45	6-13
	12-33	Sandy clay, clay, clay loam	ML	A-7-5	0	0	65-100	51-100	43-100	23-95	42-66	9-22
	33-38	Gravelly sandy loam, very gravelly sandy loam, sandy loam	SM, SC-SM	A-2-4, A-1-a	0-2	0-12	55-85	43-76	26-53	13-30	16-31	NP-6
	38-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
PaB:												
Pacolet---------	0-7	Sandy loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	90-100	84-100	50-70	25-40	17-35	1-6
	7-25	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	25-33	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-2	95-100	92-100	74-90	32-55	29-44	6-13
	33-54	Sandy clay loam, sandy loam, clay loam	ML, SM, SC-SM	A-2-4, A-7-6, A-6	0-1	0-2	95-100	92-100	83-100	28-80	16-48	1-14
	54-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-2-4, A-4, A-7-6	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13
PaD2:												
Pacolet---------	0-7	Sandy loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	90-100	84-100	50-70	25-40	17-35	1-6
	7-25	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	25-33	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-2	95-100	92-100	74-90	32-55	29-44	6-13
	33-54	Sandy clay loam, sandy loam, clay loam	ML, SM, SC-SM	A-2-4, A-7-6, A-6	0-1	0-2	95-100	92-100	83-100	28-80	16-48	1-14
	54-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-2-4, A-4, A-7-6	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13
PaE2:												
Pacolet---------	0-7	Sandy loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	90-100	84-100	50-70	25-40	17-35	1-6
	7-25	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	25-33	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-2	95-100	92-100	74-90	32-55	29-44	6-13
	33-54	Sandy clay loam, sandy loam, clay loam	ML, SM, SC-SM	A-2-4, A-7-6, A-6	0-1	0-2	95-100	92-100	83-100	28-80	16-48	1-14
	54-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-2-4, A-4, A-7-6	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
PfB3:												
Pacolet	0-6	Sandy clay loam	SC-SM	A-2-6, A-6, A-7-6	0-1	0-1	90-100	84-100	67-90	29-55	30-44	6-13
	6-24	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	24-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13
PfD3:												
Pacolet	0-6	Sandy clay loam	SC-SM	A-2-6, A-6, A-7-6	0-1	0-1	90-100	84-100	67-90	29-55	30-44	6-13
	6-24	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	24-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13
PfE3:												
Pacolet	0-6	Sandy clay loam	SC-SM	A-2-6, A-6, A-7-6	0-1	0-1	90-100	84-100	67-90	29-55	30-44	6-13
	6-24	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	24-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13
PsD:												
Pacolet	0-7	Sandy loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	90-100	84-100	50-70	25-40	17-35	1-6
	7-25	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	25-33	Sandy clay loam	SC-SM	A-7-6, A-2-6, A-6	0-1	0-2	95-100	92-100	74-90	32-55	29-44	6-13
	33-54	Sandy clay loam, sandy loam, clay loam	ML, SM, SC-SM	A-2-4, A-7-6, A-6	0-1	0-2	95-100	92-100	83-100	28-80	16-48	1-14
	54-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-7-6, A-2-4, A-4	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Saw----------	0-6	Sandy loam	SC-SM, SM	A-4, A-2-4	0	0-8	90-100	83-100	50-70	25-40	17-35	1-6
	6-11	Sandy loam	SM, SC-SM	A-2-4, A-4	0-1	0-8	90-100	83-100	50-70	25-40	16-32	1-6
	11-28	Clay, sandy clay	CL, ML, MH	A-7-6	0-1	0-8	94-100	91-100	77-100	41-95	42-66	15-24
	28-32	Sandy clay loam, sandy loam	SC-SM, SM	A-6, A-2-4, A-4	0	0-8	90-100	83-100	50-90	25-55	16-44	1-13
	>32	Bedrock			---	---	---	---	---	---	---	---
PsE:												
Pacolet---------	0-7	Sandy loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	90-100	84-100	50-70	25-40	17-35	1-6
	7-25	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	25-33	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-2	95-100	92-100	74-90	32-55	29-44	6-13
	33-54	Sandy clay loam, sandy loam, clay loam	ML, SM, SC-SM	A-2-4, A-7-6, A-6	0-1	0-2	95-100	92-100	83-100	28-80	16-48	1-14
	54-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-2-4, A-4, A-7-6	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13
Saw----------	0-6	Sandy loam	SC-SM, SM	A-4, A-2-4	0	0-8	90-100	83-100	50-70	25-40	17-35	1-6
	6-11	Sandy loam	SM, SC-SM	A-2-4, A-4	0-1	0-8	90-100	83-100	50-70	25-40	16-32	1-6
	11-28	Clay, sandy clay	CL, ML, MH	A-7-6	0-1	0-8	94-100	91-100	77-100	41-95	42-66	15-24
	28-32	Sandy clay loam, sandy loam	SC-SM, SM	A-6, A-2-4, A-4	0	0-8	90-100	83-100	50-90	25-55	16-44	1-13
	>32	Bedrock			---	---	---	---	---	---	---	---

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
PtF:												
Pacolet---	0-7	Sandy loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	90-100	84-100	50-70	25-40	17-35	1-6
	7-25	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	25-33	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-2	95-100	92-100	74-90	32-55	29-44	6-13
	33-54	Sandy clay loam, sandy loam, clay loam	ML, SM, SC-SM	A-2-4, A-7-6, A-6	0-1	0-2	95-100	92-100	83-100	28-80	16-48	1-14
	54-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-2-4, A-4, A-7-6	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13
Towaliga---	0-3	Extremely gravelly loam	SC-SM, SM, GC-GM, GM	A-2-4, A-4	0-2	0-15	38-62	19-50	16-48	11-38	19-41	1-9
	3-11	Very gravelly loam	SC-SM, SM, GC-GM, GM	A-2-4, A-4	0-2	0-20	38-62	19-50	16-48	11-38	18-38	1-9
	11-33	Very gravelly sandy loam, very gravelly sandy clay loam, very gravelly loam, very gravelly silt loam	SC-SM, SM, SP-SM, CL-ML, ML, GC-GM, GM, GP-GM	A-2-4, A-4	0-2	0-30	38-82	19-76	11-76	6-68	16-44	1-13
	33-47	Clay, sandy clay, clay loam	ML	A-7-6	0-2	0-21	86-100	82-100	70-100	37-95	35-66	9-22
	47-64	Clay loam, sandy clay loam	ML, SC-SM	A-7-6, A-2-6, A-6	0-2	0-21	88-100	83-100	66-100	29-80	29-49	6-14

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Tussahaw--------	0-3	Channery sandy loam	SC-SM, SM	A-2-4, A-4	0-5	20-53	58-98	43-95	26-67	13-38	17-35	1-8
	3-20	Very channery sandy clay loam, very channery clay loam, very channery loam	SM, CL, CL-ML, ML	A-6, A-7-6	0-2	43-60	62-90	50-88	40-88	18-70	18-49	1-18
	20-27	Very channery sandy clay loam, very channery clay loam, very channery loam	SM, CL, ML, CL-ML	A-1-b, A-7-6, A-6	0-2	43-60	62-90	50-88	40-88	18-70	18-48	1-18
	27-41	Bedrock			---	---	---	---	---	---	---	---
	>41	Bedrock			---	---	---	---	---	---	---	---
PuE:												
Pacolet---------	0-7	Sandy loam	SC-SM, SM	A-2-4, A-4	0-1	0-2	90-100	84-100	50-70	25-40	17-35	1-6
	7-25	Sandy clay, clay	CL, ML, MH	A-7-6	0-1	0-1	95-100	91-100	77-100	41-95	42-66	15-24
	25-33	Sandy clay loam	SC-SM	A-6, A-7-6, A-2-6	0-1	0-2	95-100	92-100	74-90	32-55	29-44	6-13
	33-54	Sandy clay loam, sandy clay loam, clay loam	ML, SM, SC-SM	A-2-4, A-7-6, A-6	0-1	0-2	95-100	92-100	83-100	28-80	16-48	1-14
	54-60	Sandy loam, sandy clay loam, clay loam	SC-SM, SM	A-2-4, A-4, A-7-6	0-1	0-2	95-100	92-100	55-90	28-55	16-44	1-13
Urban land------	---	---	---	---	---	---	---	---	---	---	---	---
RoC:												
Rock outcrop----	0-60	Bedrock			---	---	---	---	---	---	---	---
ToA:												
Toccoa----------	0-4	Fine sandy loam, sandy loam, loam	SC-SM, SM	A-4	0	0	98-100	97-100	68-85	39-55	18-37	2-13
	4-60	Sandy loam, fine sandy loam, loamy sand, loam	ML, SM, SC-SM, SC	A-2-4, A-4	0	0	98-100	97-100	58-95	29-75	18-41	2-19

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ua:												
Urban land------	---	---	---	---	---	---	---	---	---	---	---	---
Ud:												
Udorthents------	0-60	Sandy clay loam, sandy loam, clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7	0-2	0-3	95-100	90-100	70-98	30-90	22-60	6-36
WeA:												
Wehadkee--------	0-6	Loam	CL-ML, CL, ML	A-4, A-6	0	0	98-100	97-100	82-95	58-75	22-47	3-18
	6-27	Clay loam, loam, sandy clay loam, silt loam, silty clay loam	CL, CL-ML, ML, SC, SC-SM, SM	A-7-6, A-6, A-4	0	0	98-100	97-100	78-100	34-95	16-47	2-24
	27-60	Loamy sand, sand, sandy loam, loam, sandy clay loam, clay loam	SM, SP-SM, SC-SM, SC, ML, CL-ML, CL	A-7-6, A-2-4, A-2-6, A-4, A-6	0	0	98-100	97-100	49-100	5-80	16-44	2-25
WkA:												
Wehadkee--------	0-6	Loam	CL-ML, CL, ML	A-6, A-4	0	0	98-100	97-100	82-95	58-75	22-47	3-18
	6-27	Clay loam, loam, sandy clay loam, silt loam, silty clay loam	CL, CL-ML, ML, SC, SC-SM, SM	A-7-6, A-6, A-4	0	0	98-100	97-100	78-100	34-95	16-47	2-24
	27-60	Loamy sand, sand, sandy loam, loam, sandy clay loam, clay loam	SM, SP-SM, SC-SM, SC, ML, CL-ML, CL	A-7-6, A-2-4, A-2-6, A-4, A-6	0	0	98-100	97-100	49-100	5-80	16-44	2-25

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WyD:												
Wynott----------	0-5	Sandy loam	SC-SM, SM	A-2-4	0-2	0-2	85-100	77-100	46-70	23-40	17-35	2-13
	5-9	Sandy loam	SC-SM, SM	A-2-4	0-2	0-2	85-100	77-100	46-70	23-40	16-32	2-13
	9-17	Clay	CH, CL	A-7, A-7-6	0	0-2	85-100	77-100	68-100	57-95	45-90	25-65
	17-23	Sandy clay	CL, SC, CH	A-7-6, A-7	0-2	0-2	85-100	77-100	65-95	35-60	29-75	15-40
	23-37	Sandy loam, sandy clay loam	SC-SM, SC	A-6, A-4, A-2-4	0-2	0-2	85-100	77-100	46-90	23-55	24-44	9-25
	37-47	Bedrock			---	---	---	---	---	---	---	---
Wilkes----------	0-3	Sandy loam	SC, SM, SC-SM	A-2-4, A-4	0-2	0-10	85-100	77-100	46-70	23-40	17-35	2-13
	3-6	Sandy loam	SC, SM, SC-SM	A-2-4, A-4	0-2	0-10	85-100	77-100	46-70	23-40	16-32	2-13
	6-18	Sandy clay loam, clay loam, clay	SC, CL, ML	A-7-6, A-7, A-6	0-1	0-10	85-100	77-100	62-100	27-95	31-75	13-40
	18-45	Bedrock			---	---	---	---	---	---	---	---
	>45	Bedrock			---	---	---	---	---	---	---	---
Winnsboro-------	0-5	Sandy loam	SC-SM, SM	A-2-4	0-2	0-2	90-100	85-100	50-70	25-40	17-35	2-13
	5-9	Sandy loam	SC-SM, SM	A-2-4	0-2	0-2	90-100	85-100	50-70	25-40	16-32	2-13
	9-26	Clay, sandy clay	CL, CH	A-7-6, A-7	0-2	0-1	90-100	85-100	71-100	37-95	45-90	25-65
	26-42	Sandy clay loam	SC	A-6	0-2	0-2	90-100	84-100	67-90	29-55	29-44	13-25
	42-50	Sandy clay loam	SC	A-6, A-2-6	0-2	0-2	90-100	84-100	67-90	29-55	29-44	13-25
	50-56	Sandy clay loam, sandy loam	SC-SM, SM, SC	A-6, A-2-6, A-2-4	0-2	0-2	90-100	84-100	50-90	25-55	16-44	2-25
	56-60	Bedrock			---	---	---	---	---	---	---	---
WyE:												
Wynott----------	0-5	Sandy loam	SC-SM, SM	A-2-4	0-2	0-2	85-100	77-100	46-70	23-40	17-35	2-13
	5-9	Sandy loam	SC-SM, SM	A-2-4	0-2	0-2	85-100	77-100	46-70	23-40	16-32	2-13
	9-17	Clay	CH, CL	A-7, A-7-6	0	0-2	85-100	77-100	68-100	57-95	45-90	25-65
	17-23	Sandy clay	CL, SC, CH	A-7-6, A-7	0-2	0-2	85-100	77-100	65-95	35-60	29-75	14-40
	23-37	Sandy loam, sandy clay loam	SC-SM, SC	A-6, A-4, A-2-4	0-2	0-2	85-100	77-100	46-90	23-55	24-44	9-25
	37-47	Bedrock			---	---	---	---	---	---	---	---

Engineering Soil Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Wilkes----------	0-3	Sandy loam	SC, SM, SC-SM	A-2-4, A-4	0-2	0-10	85-100	77-100	46-70	23-40	17-35	2-13
	3-6	Sandy loam	SC, SM, SC-SM	A-2-4, A-4	0-2	0-10	85-100	77-100	46-70	23-40	16-32	2-13
	6-18	Sandy clay loam, clay loam, clay	SC, CL, ML	A-7-6, A-7, A-6	0-1	0-10	85-100	77-100	62-100	27-95	31-75	13-40
	18-45	Bedrock			---	---	---	---	---	---	---	---
	>45	Bedrock			---	---	---	---	---	---	---	---
Winnsboro-------	0-5	Sandy loam	SC-SM, SM	A-2-4	0-2	0-2	90-100	85-100	50-70	25-40	17-35	2-13
	5-9	Sandy loam	SC-SM, SM	A-2-4	0-2	0-2	90-100	85-100	50-70	25-40	16-32	2-13
	9-26	Clay, sandy clay	CL, CH	A-7-6, A-7	0-2	0-1	90-100	85-100	71-100	37-95	45-90	25-65
	26-42	Sandy clay loam	SC	A-6	0-2	0-2	90-100	84-100	67-90	29-55	29-44	13-25
	42-50	Sandy clay loam	SC	A-6, A-2-6	0-2	0-2	90-100	84-100	67-90	29-55	29-44	13-25
	50-56	Sandy clay loam, sandy loam	SC-SM, SM, SC	A-6, A-2-6, A-2-4	0-2	0-2	90-100	84-100	50-90	25-55	16-44	2-25
	56-60	Bedrock			---	---	---	---	---	---	---	---

Physical and Chemical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Soil reaction	Organic matter	Erosion factors		
									Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	pH	Pct			
ArC:											
Ashlar----------	0-7	5-15	1.30-1.55	2-6	0.08-0.12	0.0-2.9	4.5-5.5	0.5-1.0	.24	.24	2
	7-15	5-15	1.30-1.55	2-6	0.04-0.12	0.0-2.9	4.5-5.5	0.0-0.5	.24	.28	
	15-25	5-15	1.30-1.55	2-6	0.04-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.24	.28	
	>25	---	---	---	---	---	---	---	---	---	
Rock outcrop------	0-60	---	---	---	---	---	---	---	---	---	--
Wake----------	0-4	2-15	1.60-1.80	6-20	0.05-0.08	0.0-2.9	4.5-6.0	0.5-1.0	.15	.20	1
	4-14	2-15	1.60-1.80	6-20	0.05-0.08	0.0-2.9	4.5-6.0	0.0-0.2	.15	.20	
	>14	---	---	---	---	---	---	---	---	---	
AwE:											
Ashlar----------	0-7	5-15	1.30-1.55	2-6	0.08-0.12	0.0-2.9	4.5-5.5	0.5-1.0	.24	.24	2
	7-15	5-15	1.30-1.55	2-6	0.04-0.12	0.0-2.9	4.5-5.5	0.0-0.5	.24	.28	
	15-25	5-15	1.30-1.55	2-6	0.04-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.24	.28	
	>25	---	---	---	---	---	---	---	---	---	
Wake----------	0-4	2-15	1.60-1.80	6-20	0.05-0.08	0.0-2.9	4.5-6.0	0.5-1.0	.15	.20	1
	4-14	2-15	1.60-1.80	6-20	0.05-0.08	0.0-2.9	4.5-6.0	0.0-0.2	.15	.20	
	>14	---	---	---	---	---	---	---	---	---	
BwB:											
Buncombe----------	0-10	3-12	1.55-1.65	6-20	0.06-0.10	0.0-2.9	4.5-5.5	0.5-1.0	.10	.10	5
	10-60	3-12	1.55-1.70	6-20	0.03-0.07	0.0-2.9	4.5-5.5	0.0-0.2	.10	.10	
CaB:											
Cataula----------	0-4	5-20	1.50-1.60	2-6	0.08-0.11	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	3
	4-7	5-20	1.50-1.60	0.6-2	0.08-0.11	0.0-2.9	4.5-5.5	0.2-0.8	.28	.28	
	7-23	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.24	.24	
	23-30	35-60	1.35-1.45	0.2-0.6	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.24	.24	
	30-40	35-60	1.75-1.90	0.06-0.2	0.06-0.08	0.0-2.9	4.5-5.5	0.0-0.5	.24	.24	
	40-52	20-40	1.35-1.55	0.2-0.6	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.24	.24	
	52-60	5-35	1.35-1.60	0.2-0.6	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.32	.32	
CeB:											
Cecil----------	0-8	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	4
	8-11	20-40	1.40-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.2-0.8	.28	.28	
	11-37	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	37-48	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	48-60	5-35	1.45-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
CeC2:											
Cecil----------	0-8	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	4
	8-11	20-40	1.40-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.2-0.8	.28	.28	
	11-37	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	37-48	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	48-60	5-35	1.45-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
CfB2:											
Cecil----------	0-4	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	3
	4-43	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	43-50	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	50-60	5-35	1.45-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	

Physical and Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Soil reaction	Organic matter	Erosion factors		
									Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	pH	Pct			
CfC3:											
Cecil	0-4	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	3
	4-43	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	43-50	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	50-60	5-35	1.45-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
CuC:											
Cecil	0-8	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	4
	8-11	20-40	1.40-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.2-0.8	.28	.28	
	11-37	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	37-48	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	48-60	5-35	1.45-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
Urban land	---	---	---	---	---	---	---	---	---	---	--
CwA:											
Chewacla	0-6	7-27	1.45-1.55	0.6-2	0.16-0.19	0.0-2.9	4.5-6.5	1.0-4.0	.28	.28	5
	6-25	7-40	1.40-1.60	0.6-2	0.11-0.13	0.0-2.9	4.5-6.5	0.5-2.0	.32	.32	
	25-30	7-35	1.45-1.55	0.6-2	0.11-0.13	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	
	30-40	5-40	1.45-1.65	0.6-2	0.10-0.14	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	
	40-60	5-60	1.40-1.65	0.6-2	0.10-0.14	0.0-2.9	4.5-6.5	0.0-0.5	.28	.28	
DAM:											
Dam	---	---	---	---	---	---	---	---	---	---	--
HaB:											
Hard Labor	0-9	5-35	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.24	.24	4
	9-15	5-35	1.45-1.60	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.2-0.8	.28	.28	
	15-36	35-60	1.25-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	36-50	35-60	1.60-1.80	0.06-0.2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	50-60	20-55	1.35-1.55	0.2-0.6	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
HzB, HzC:											
Helena	0-8	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.24	.24	4
	8-11	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-5.5	0.2-0.8	.24	.24	
	11-30	35-60	1.35-1.45	0.06-0.2	0.13-0.15	3.0-5.9	4.5-5.5	0.0-0.5	.28	.28	
	30-35	35-60	1.35-1.45	0.06-0.2	0.13-0.15	3.0-5.9	4.5-5.5	0.0-0.5	.28	.28	
	35-45	20-40	1.40-1.55	0.2-0.6	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	45-60	5-35	1.45-1.60	0.2-0.6	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
LdB:											
Lloyd	0-10	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	5
	10-55	27-60	1.35-1.50	0.6-2	0.12-0.15	0.0-2.9	4.5-6.5	0.0-0.5	.28	.28	
	55-60	20-40	1.40-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-6.5	0.0-0.5	.28	.28	
LfB3, LfD3:											
Lloyd	0-4	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	5
	4-35	27-60	1.30-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-6.5	0.0-0.5	.28	.28	
	35-59	20-40	1.30-1.45	0.6-2	0.10-0.14	0.0-2.9	4.5-6.5	0.0-0.5	.28	.28	
	59-60	7-35	1.45-1.65	0.6-2	0.11-0.15	0.0-2.9	4.5-6.5	0.0-0.2	.28	.28	
MaB2, MaD2, MaE2:											
Madison	0-5	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.24	.24	4
	5-24	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.32	.32	
	24-38	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.32	.32	
	38-50	5-35	1.45-1.60	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.2	.32	.32	
	50-60	5-20	1.50-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.37	.37	

Physical and Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Soil reaction	Organic matter	Erosion factors		
									Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	pH	Pct			
MdB3, MdD3, MdE3:											
Madison	0-4	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	3
	4-20	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.32	.32	
	20-45	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.32	.32	
	45-60	5-35	1.45-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.37	.37	
MsD, MsE:											
Madison	0-5	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.24	.24	4
	5-24	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.32	.32	
	24-38	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.32	.32	
	38-50	5-35	1.45-1.60	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.2	.32	.32	
	50-60	5-20	1.50-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.37	.37	
Bethlehem	0-8	5-20	1.50-1.60	2-6	0.06-0.11	0.0-2.9	4.5-5.5	0.5-2.0	.15	.28	3
	8-12	20-35	1.45-1.55	0.6-2	0.06-0.12	0.0-2.9	4.5-5.5	0.2-0.8	.24	.28	
	12-33	35-60	1.25-1.50	0.6-2	0.05-0.08	0.0-2.9	4.5-5.5	0.0-0.5	.28	.32	
	33-38	5-20	1.50-1.60	0.6-2	0.05-0.08	0.0-2.9	4.5-5.5	0.0-0.2	.20	.28	
	38-60	---	---	---	---	---	---	---	---	---	
PaB:											
Pacolet	0-7	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.20	.20	3
	7-25	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	25-33	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	33-54	5-40	1.40-1.60	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
	54-60	5-35	1.50-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
PaD2, PaE2:											
Pacolet	0-7	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.20	.20	3
	7-25	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	25-33	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	33-54	5-40	1.40-1.60	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
	54-60	5-35	1.50-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
PfB3, PfD3, PfE3:											
Pacolet	0-6	20-31	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-6.5	0.5-2.0	.24	.24	2
	6-24	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	24-60	5-35	1.50-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
PsD, PsE:											
Pacolet	0-7	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.20	.20	3
	7-25	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	25-33	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	33-54	5-40	1.40-1.60	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
	54-60	5-35	1.50-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
Saw	0-6	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.20	.20	2
	6-11	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-5.5	0.2-0.8	.28	.28	
	11-28	35-60	1.25-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	28-32	5-35	1.45-1.60	0.6-6	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.20	.28	
	>32	---	---	---	---	---	---	---	---	---	
PtF:											
Pacolet	0-7	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.20	.20	3
	7-25	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	25-33	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	33-54	5-40	1.40-1.60	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
	54-60	5-35	1.50-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	

Physical and Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Soil reaction	Organic matter	Erosion factors		
									Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	pH	Pct			
Towaliga----------	0-3	7-27	1.45-1.55	2-6	0.01-0.03	0.0-2.9	4.5-5.5	0.5-2.0	.05	.28	5
	3-11	7-27	1.45-1.55	2-6	0.02-0.06	0.0-2.9	4.5-5.5	0.2-0.8	.10	.32	
	11-33	5-35	1.45-1.60	2-6	0.02-0.06	0.0-2.9	4.5-5.5	0.0-0.5	.05	.24	
	33-47	27-60	1.35-1.50	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.20	.20	
	47-64	20-40	1.40-1.55	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.5	.24	.24	
Tussahaw----------	0-3	5-20	1.50-1.60	2-6	0.05-0.10	0.0-2.9	4.5-5.5	0.5-2.0	.10	.24	3
	3-20	7-40	1.40-1.55	0.6-2	0.03-0.08	0.0-2.9	4.5-5.5	0.0-0.5	.10	.28	
	20-27	7-40	1.40-1.55	0.6-2	0.03-0.08	0.0-2.9	4.5-5.5	0.0-0.2	.10	.28	
	27-41	---	---	---	---	---	---	---	---	---	
	>41	---	---	---	---	---	---	---	---	---	
PuE:											
Pacolet-----------	0-7	5-20	1.50-1.60	2-6	0.08-0.12	0.0-2.9	4.5-6.5	0.5-2.0	.20	.20	3
	7-25	35-60	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	25-33	20-35	1.45-1.55	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.5	.28	.28	
	33-54	5-40	1.40-1.60	0.6-2	0.10-0.14	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
	54-60	5-35	1.50-1.60	0.6-2	0.08-0.12	0.0-2.9	4.5-5.5	0.0-0.2	.28	.28	
Urban land--------	---	---	---	---	---	---	---	---	---	---	--
RoC:											
Rock outcrop------	0-60	---	---	---	---	---	---	---	---	---	--
ToA:											
Toccoa------------	0-4	5-20	1.50-1.60	2-6	0.10-0.14	0.0-2.9	5.1-6.5	1.0-3.0	.10	.10	4
	4-60	5-27	1.45-1.65	2-6	0.09-0.12	0.0-2.9	5.1-6.5	1.0-2.0	.20	.20	
Ua:											
Urban land--------	---	---	---	---	---	---	---	---	---	---	--
Ud:											
Udorthents--------	0-60	10-50	1.30-1.65	0.00-2	0.10-0.17	3.0-5.9	4.5-7.8	0.0-1.0	.28	.28	5
WeA:											
Wehadkee----------	0-6	7-27	1.45-1.55	2-6	0.18-0.19	0.0-2.9	4.5-6.5	2.0-5.0	.24	.24	5
	6-27	5-35	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	4.5-7.3	0.0-2.0	.32	.32	
	27-60	5-35	1.40-1.70	6-20	0.05-0.18	0.0-2.9	4.5-7.3	0.0-0.5	.32	.32	
WkA:											
Wehadkee----------	0-6	7-27	1.45-1.55	2-6	0.18-0.19	0.0-2.9	4.5-6.5	2.0-5.0	.24	.24	5
	6-27	5-35	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	4.5-7.3	0.0-2.0	.32	.32	
	27-60	5-35	1.40-1.70	6-20	0.05-0.18	0.0-2.9	4.5-7.3	0.0-0.5	.32	.32	
WyD, WyE:											
Wynott------------	0-5	5-20	1.50-1.60	2-6	0.11-0.15	0.0-2.9	4.5-6.5	0.5-2.0	.28	.28	3
	5-9	5-20	1.50-1.60	2-6	0.11-0.15	0.0-2.9	4.5-6.5	0.2-0.8	.28	.28	
	9-17	35-65	1.25-1.45	0.06-0.2	0.13-0.20	6.0-8.9	5.6-6.5	0.0-0.5	.28	.28	
	17-23	20-50	1.35-1.45	0.2-0.6	0.10-0.15	0.0-2.9	5.6-6.5	0.0-0.5	.28	.28	
	23-37	15-35	1.45-1.60	0.2-0.6	0.11-0.15	0.0-2.9	5.6-6.5	0.0-0.2	.28	.28	
	37-47	---	---	---	---	---	---	---	---	---	
Wilkes------------	0-3	5-20	1.50-1.60	2-6	0.11-0.15	0.0-2.9	5.1-6.5	0.5-2.0	.24	.24	2
	3-6	5-20	1.50-1.60	2-6	0.11-0.15	0.0-2.9	5.1-6.5	0.2-0.8	.24	.24	
	6-18	20-45	1.35-1.55	0.2-0.6	0.13-0.20	3.0-5.9	6.1-7.8	0.0-0.5	.32	.32	
	18-45	---	---	---	---	---	---	---	---	---	
	>45	---	---	---	---	---	---	---	---	---	

Physical and Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Soil reaction	Organic matter	Erosion factors		
									Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	pH	Pct			
Winnsboro---------	0-5	5-20	1.50-1.60	2-6	0.11-0.15	0.0-2.9	5.1-6.5	0.5-2.0	.28	.28	4
	5-9	5-20	1.50-1.60	2-6	0.11-0.15	0.0-2.9	5.1-6.5	0.2-0.8	.28	.28	
	9-26	35-60	1.25-1.45	0.06-0.2	0.13-0.20	6.0-8.9	6.1-7.8	0.0-0.5	.20	.20	
	26-42	20-35	1.45-1.55	0.2-0.6	0.10-0.15	0.0-2.9	6.1-7.8	0.0-0.5	.28	.28	
	42-50	20-35	1.45-1.55	0.2-0.6	0.10-0.15	0.0-2.9	6.1-7.8	0.0-0.2	.28	.28	
	50-56	5-35	1.45-1.60	0.2-0.6	0.11-0.15	0.0-2.9	6.1-7.8	0.0-0.2	.28	.28	
	56-60	---	---	---	---	---	---	---	---	---	

Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft		Ft				
ArC:									
Ashlar	B	Jan-Dec	>6.0	---	---	---	None	---	None
Rock outcrop	---	Jan-Dec	>6.0	---	---	---	None	---	None
Wake	D	Jan-Dec	>6.0	---	---	---	None	---	None
AwE:									
Ashlar	B	Jan-Dec	>6.0	---	---	---	None	---	None
Wake	D	Jan-Dec	>6.0	---	---	---	None	---	None
BwB:									
Buncombe	A	Jan-Apr	---	---	---	---	None	Very brief	Occasional
		May-Dec	---	---	---	---	None	Very brief	Rare
CaB:									
Cataula	B	Dec-Apr	2.5-3.3	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	None	---	None
CeB:									
Cecil	B	Jan-Dec	>6.0	---	---	---	None	---	None
CeC2:									
Cecil	B	Jan-Dec	>6.0	---	---	---	None	---	None
CfB2:									
Cecil	B	Jan-Dec	>6.0	---	---	---	None	---	None
CfC3:									
Cecil	B	Jan-Dec	>6.0	---	---	---	None	---	None
CuC:									
Cecil	B	Jan-Dec	>6.0	---	---	---	None	---	None
Urban land	---	Jan-Dec	>6.0	---	---	---	None	---	None
CwA:									
Chewacla	C	Dec-Apr	0.5-2.0	Apparent	---	---	None	Brief	Frequent
		May-Nov	---	---	---	---	None	Brief	Rare
DAM:									
Dam	---	Jan-Dec	>6.0	---	---	---	---	---	None
HaB:									
Hard Labor	B	Dec-Apr	2.5-3.3	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	None	---	None
HzB, HzC:									
Helena	C	Dec-Apr	1.5-2.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	None	---	None
LdB:									
Lloyd	B	Jan-Dec	>6.0	---	---	---	None	---	None
LfB3, LfD3:									
Lloyd	B	Jan-Dec	>6.0	---	---	---	None	---	None

Water Features—Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft		Ft				
MaB2, MaD2, MaE2:									
Madison	B	Jan-Dec	>6.0	---	---	---	None	---	None
MdB3, MdD3, MdE3:									
Madison	B	Jan-Dec	>6.0	---	---	---	None	---	None
MsD, MsE:									
Madison	B	Jan-Dec	>6.0	---	---	---	None	---	None
Bethlehem	B	Jan-Dec	>6.0	---	---	---	None	---	None
PaB:									
Pacolet	B	Jan-Dec	>6.0	---	---	---	None	---	None
PaD2, PaE2:									
Pacolet	B	Jan-Dec	>6.0	---	---	---	None	---	None
PfB3, PfD3, PfE3:									
Pacolet	B	Jan-Dec	>6.0	---	---	---	None	---	None
PsD, PsE:									
Pacolet	B	Jan-Dec	>6.0	---	---	---	None	---	None
Saw	B	Jan-Dec	>6.0	---	---	---	None	---	None
PtF:									
Pacolet	B	Jan-Dec	>6.0	---	---	---	None	---	None
Towaliga	B	Jan-Dec	>6.0	---	---	---	None	---	None
Tussahaw	B	Jan-Dec	>6.0	---	---	---	None	---	None
PuE:									
Pacolet	B	Jan-Dec	>6.0	---	---	---	None	---	None
Urban land	---	Jan-Dec	>6.0	---	---	---	None	---	None
RoC:									
Rock outcrop	---	Jan-Dec	>6.0	---	---	---	None	---	None
ToA:									
Toccoa	B	Dec-Apr	3.3-5.0	Apparent	---	---	None	Brief	Frequent
		May-Nov	---	---	---	---	None	Very brief	Rare
Ua:									
Urban land	---	Jan-Dec	>6.0	---	---	---	None	---	None
Ud:									
Udorthents	B	Jan-Dec	>6.0	---	---	---	None	---	None
WeA:									
Wehadkee	D	Dec-Apr	0.0-1.0	Apparent	---	---	None	Long	Frequent
		May	0.0-1.0	Apparent	---	---	None	Brief	Occasional
		Jun-Oct	---	---	---	---	None	Brief	Rare
		Nov	0.0-1.0	Apparent	---	---	None	Brief	Occasional

Water Features—Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft		Ft				
WkA:									
Wehadkee	D	Dec-Apr	0.0-1.0	Apparent	0.0-2.0	Very long	Frequent	Long	Frequent
		May	0.0-1.0	Apparent	0.0-2.0	Very long	Frequent	Brief	Occasional
		Jun	0.0-1.0	Apparent	0.0-2.0	Long	Frequent	Brief	Rare
		Jul	0.0-1.0	Apparent	0.0-1.5	Long	Frequent	Brief	Rare
		Aug-Sep	0.0-1.0	Apparent	0.0-0.5	Long	Frequent	Brief	Rare
		Oct	0.0-1.0	Apparent	0.0-1.5	Long	Frequent	Brief	Rare
		Nov	0.0-1.0	Apparent	0.0-2.0	Long	Frequent	Brief	Occasional
WyD, WyE:									
Wynott	C	Jan-Dec	>6.0	---	---	---	None	---	None
Wilkes	C	Jan-Dec	>6.0	---	---	---	None	---	None
Winnsboro	C	Jan-Dec	>6.0	---	---	---	None	---	None

Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer			Risk of corrosion	
	Kind	Depth to top	Hardness	Uncoated steel	Concrete
		In	In		In
ArC:					
Ashlar	Bedrock (lithic)	23-40	Indurated	Moderate	Moderate
Rock outcrop	Bedrock (lithic)	---	Indurated	---	---
Wake	Bedrock (lithic)	11-20	Indurated	Moderate	Moderate
AwE:					
Ashlar	Bedrock (lithic)	23-40	Indurated	Moderate	Moderate
Wake	Bedrock (lithic)	11-20	Indurated	Moderate	Moderate
BwB:					
Buncombe	---	---	---	Low	Moderate
CaB:					
Cataula	---	---	---	High	Moderate
CeB:					
Cecil	---	---	---	High	High
CeC2:					
Cecil	---	---	---	High	High
CfB2:					
Cecil	---	---	---	High	High
CfC3:					
Cecil	---	---	---	High	High
CuC:					
Cecil	---	---	---	High	High
Urban land	---	---	---	---	---
CwA:					
Chewacla	---	---	---	High	Moderate
DAM:					
Dam	---	---	---	---	---
HaB:					
Hard Labor	---	---	---	High	Moderate
HzB, HzC:					
Helena	---	---	---	High	High
LdB:					
Lloyd	---	---	---	Moderate	Moderate
LfB3, LfD3:					
Lloyd	---	---	---	Moderate	Moderate
MaB2, MaD2, MaE3:					
Madison	---	---	---	High	Moderate
MdB3, MdD3, MdE3:					
Madison	---	---	---	High	Moderate

Soil Features—Continued

Map symbol and soil name	Restrictive layer			Risk of corrosion	
	Kind	Depth to top	Hardness	Uncoated steel	Concrete
		In	In		In
MsD, MsE:					
Madison	---	---	---	High	Moderate
Bethlehem	Bedrock (paralithic)	20-40	Moderately cemented	High	Moderate
PaB:					
Pacolet	---	---	---	High	High
PaD2, PaE2:					
Pacolet	---	---	---	High	High
PfB3, PfD3, PfE3:					
Pacolet	---	---	---	High	High
PsD, PsE:					
Pacolet	---	---	---	High	High
Saw	Bedrock (lithic)	22-40	Indurated	High	High
PtF:					
Pacolet	---	---	---	High	High
Towaliga	---	---	---	High	Moderate
Tussahaw	Bedrock (paralithic)	20-40	Moderately cemented	High	Moderate
	Bedrock (lithic)	40-60	Indurated		
PuE:					
Pacolet	---	---	---	High	High
Urban land	---	---	---	---	---
RoC:					
Rock outcrop	Bedrock (lithic)	---	Indurated	---	---
ToA:					
Toccoa	---	---	---	Moderate	Moderate
Ua:					
Urban land	---	---	---	---	---
Ud:					
Udorthents	---	---	---	High	High
WeA:					
Wehadkee	---	---	---	High	Moderate
WkA:					
Wehadkee	---	---	---	High	Moderate
WyD, WyE:					
Wynott	Bedrock (paralithic)	20-39	Weakly cemented	Moderate	High
Wilkes	Bedrock (paralithic)	10-20	Weakly cemented	Moderate	Moderate
	Bedrock (lithic)	39-60	Strongly cemented		
Winnsboro	Bedrock (paralithic)	39-60	Weakly cemented	Moderate	High

Taxonomic Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Ashlar	Coarse-loamy, mixed, semiactive, thermic Typic Dystrudepts
Bethlehem	Fine, kaolinitic, thermic Typic Kanhapludults
Buncombe	Mixed, thermic Typic Udipsamments
Cataula	Fine, kaolinitic, thermic Oxyaquic Kanhapludults
Cecil	Fine, kaolinitic, thermic Typic Kanhapludults
Chewacla	Fine-loamy, mixed, active, thermic Fluvaquentic Dystrudepts
Hard Labor	Fine, kaolinitic, thermic Oxyaquic Kanhapludults
Helena	Fine, mixed, semiactive, thermic Aquic Hapludults
Lloyd	Fine, kaolinitic, thermic Rhodic Kanhapludults
Madison	Fine, kaolinitic, thermic Typic Kanhapludults
Pacolet	Fine, kaolinitic, thermic Typic Kanhapludults
Saw	Fine, kaolinitic, thermic Typic Kanhapludults
Toccoa	Coarse-loamy, mixed, active, nonacid, thermic Typic Udifluvents
Towaliga	Fine, kaolinitic, thermic Typic Hapludults
Tussahaw	Loamy-skeletal, mixed, thermic Typic Hapludults
Udorthents	Udorthents
Wake	Mixed, thermic Lithic Udipsamments
Wehadkee	Fine-loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts
Wilkes	Loamy, mixed, active, thermic, shallow Typic Hapludalfs
Winnsboro	Fine, mixed, active, thermic Typic Hapludalfs
Wynott	Fine, mixed, active, thermic Typic Hapludalfs

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