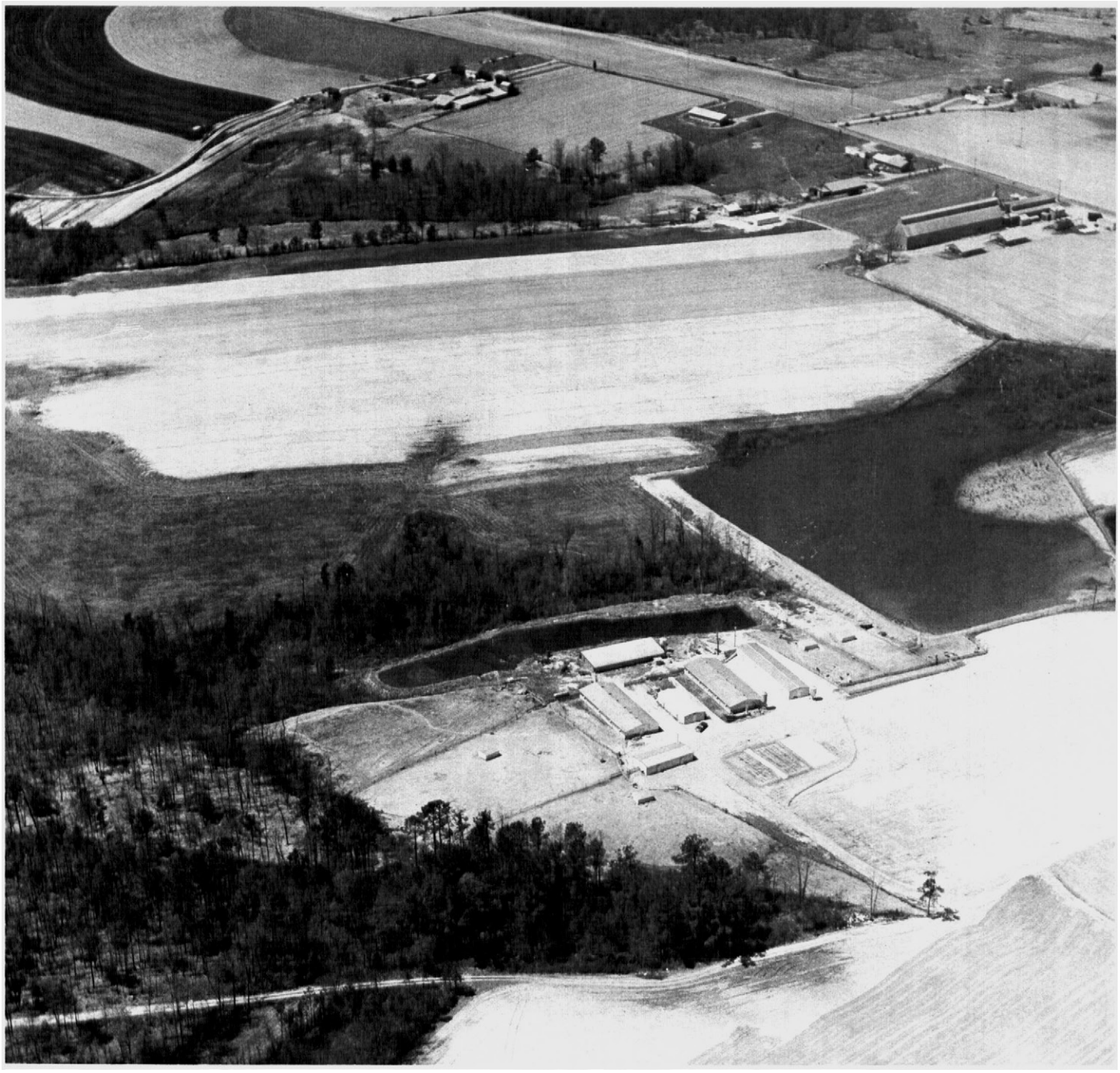
United States Department of Agriculture

Soil Conservation Service

In cooperation with Virginia Polytechnic Institute and State University

Soil Survey of Greensville County, Virginia



How To Use This Soil Survey

General Soil Map

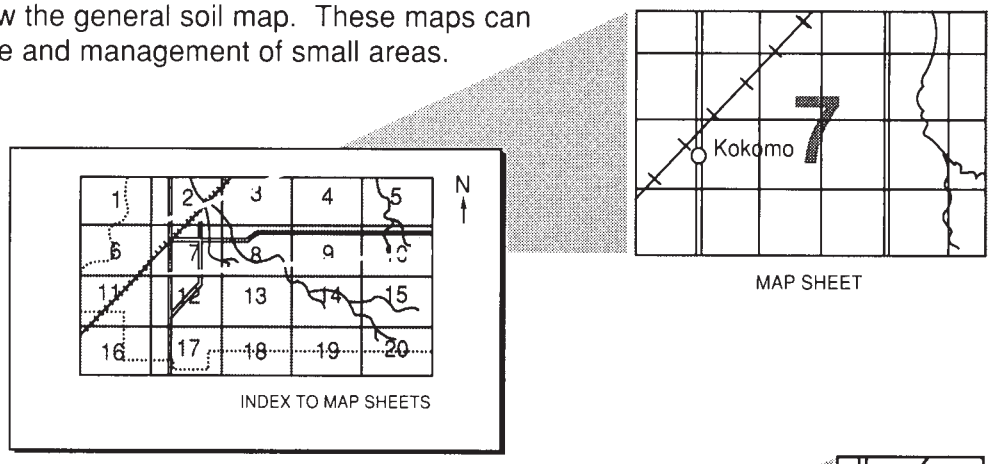
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

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 follow the general soil map. These maps can be useful in planning the use and management of small areas.

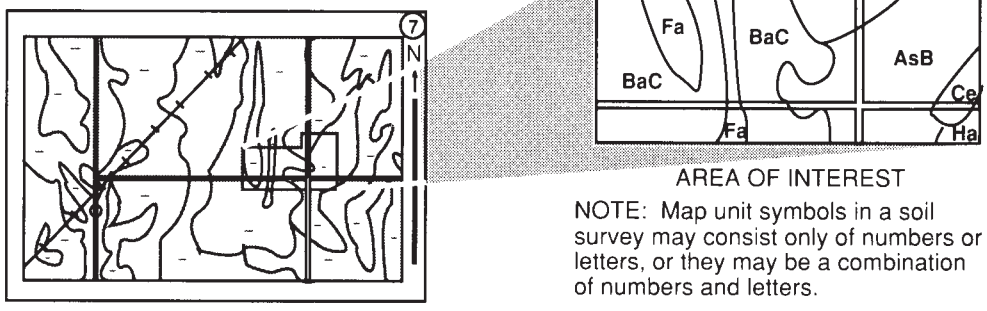
To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



INDEX TO MAP SHEETS

MAP SHEET

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



MAP SHEET

AREA OF INTEREST

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.

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

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 Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, handicap, or age.

Major fieldwork for this soil survey was completed in 1985. Soil names and descriptions were approved in 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This survey was made cooperatively by the Soil Conservation Service and the Virginia Polytechnic Institute and State University. Additional assistance was provided by the Greensville County Board of Supervisors. The survey is part of the technical assistance furnished to the J. R. Horsley Soil and Water Conservation District.

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.

Cover: An area in the Appling-Roanoke-Mattaponi general soil map unit.

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Issued June 1989

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Summary of Tables

Foreword

This soil survey contains information that can be used in land-planning programs in Greensville County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it 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 survey 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 survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. 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. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

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Soil Survey of Greensville County, Virginia

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United States Department of Agriculture, Soil Conservation Service
In cooperation with
Virginia Polytechnic Institute and State University

GREENSVILLE COUNTY is in the southeast part of Virginia (fig. 1). The county is about 301 square miles, or 192,800 acres. The county offices are in the city of Emporia, which is near the center of the county. Jarratt, in the northeast part of the county, is the only incorporated town. The population of the survey area in 1980 was 15,743.

Farming and forestry are the major land uses in the county. The county is about 73 percent woodland and 27 percent farmland. Most of the farms produce peanuts, corn, soybeans, small grains, tobacco, and cotton. Swine, cattle, and chickens are the major types of livestock. Wood products and textiles are the major manufactured goods.

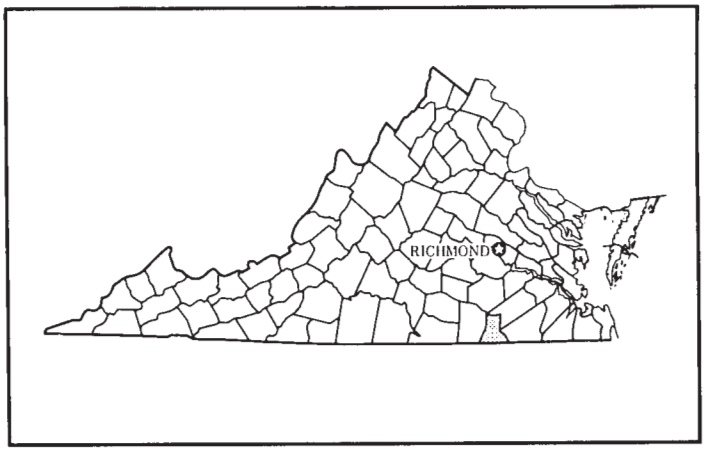

Figure 1.—Location of Greensville County in Virginia.

General Nature of the County

This section provides information about some of the natural and cultural factors that affect land use in the county.

Climate

Prepared at Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

Table 1 gives data on temperature and precipitation for the western half of the survey area, as recorded at Lawrenceville. Table 2 gives data on temperature and precipitation for the eastern half of the survey area, as recorded at Boykins. Tables 3 and 4 show probable dates of the first freeze in fall and the last freeze in spring at Lawrenceville and at Boykins. Tables 5 and 6 provide data on length of the growing season at Lawrenceville and at Boykins.

In Lawrenceville the average temperature in winter is 39.4 degrees F, and the average daily minimum temperature is 28 degrees. The average temperature in summer is 75.1 degrees, and the average daily maximum temperature is 87.2 degrees. The lowest temperature at Lawrenceville was -6 degrees on February 10, 1979. The highest temperature was 103 degrees on June 29, 1959.

In Boykins the average temperature in winter is 40.9 degrees, and the average daily minimum temperature is

29.7 degrees. The average temperature in summer is 76.6 degrees, and the average daily maximum temperature is 88.1 degrees. The lowest temperature at Lawrenceville was 0 degrees on December 16, 1958. The highest temperature was 102 degrees on June 30, 1959.

Growing degree days are shown in tables 1 and 2. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day is greater than 40 degrees. 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.

In Lawrenceville the total average annual precipitation is 45.4 inches, about 52 percent of which falls during the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 28.3 inches. The heaviest 1-day rainfall during the period of record was 8.11 inches at Lawrenceville on October 5, 1972. The average seasonal snowfall in Lawrenceville is 13.4 inches. The greatest snow depth was 14 inches.

In Boykins the total average annual precipitation is 47.7 inches, about 55 percent of which falls during the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 30.7 inches. The heaviest 1-day rainfall during the period of record was 5.1 inches at Boykins on September 12, 1960. The average seasonal snowfall in Boykins is 7.9 inches. The greatest snow depth was 12 inches.

History

Exploration of the survey area by Europeans started about 1650 when fur trading expanded south of the James River along the Tuscarora Path. Settlement of the area started about 1710, and Greensville County was formed from part of Brunswick County in 1780. The county was named after General Nathaniel Greene, a Rhode Island native who served during the Revolutionary War.

Water Resources

The Meherrin and Nottoway Rivers provide sources of surface water for municipal and industrial uses. Smaller freshwater streams throughout the survey area generally provide sufficient water for most uses, but surface reservoirs are needed for water during periods of drought. The streams generally carry a large sediment load after heavy rains.

Small quantities of water are obtained from shallow wells in the unconsolidated sediments of stratified sand and clay. Large quantities of water are obtained from deep wells in these sediments. Deep wells in the weathered rocks of the Piedmont yield moderate amounts of water.

Transportation

Three major highways serve the area. Interstate Route 95 crosses the county and provides access to points north and south, as does U.S. Route 301. U.S. Route 58 crosses the county and provides access to points east and west.

Physiography, Relief, and Drainage

The survey area is bisected by the fall line which coincides roughly with Interstate Route 95. The Piedmont physiographic province is to the west of the fall line, and the Atlantic Coastal Plain is to the east. Elevation ranges from about 40 feet above sea level in the eastern part of the county where the Meherrin River leaves the survey area to about 330 above sea level on the highest ridges in the western part of the county.

The Coastal Plain area is nearly level and generally not dissected by streams. Well defined, short, steep escarpments separate stream terraces from the flood plains of the Meherrin River and Fontaine Creek in this area. This area contains poorly drained to well drained soils.

The Piedmont area ranges from nearly level to steep and is highly dissected. Drainageways are well defined and in a dendritic pattern. Flood plains are narrow, side slopes are moderately steep to steep, and interfluves are narrow. The area contains poorly drained soils along drainageways and in upland depressions and moderately well drained to well drained soils on toe slopes, side slopes, and ridges.

Streambed gradients of the Nottoway and Meherrin Rivers decrease from about 2 feet per mile in the Piedmont to about 1 foot per mile in the Coastal Plain. East of Interstate 95 those rivers begin to meander and their flood plains are wider and more poorly drained.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil

scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; 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 has few or no roots or other living organisms and has been changed very little by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil 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-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, acidity, 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. 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 interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were 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 were 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 state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure 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.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. 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 soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to

other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association 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 association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

In some areas along the borders of the county's general soil map, the soil names and boundaries do not match those of adjacent counties. These discrepancies exist because of differences in the detail of mapping, changes in soil classification, and differences in the properties of the soil.

Soil Descriptions

1. Appling-Roanoke-Mattaponi

Nearly level to sloping, very deep, poorly drained to well drained soils with a clayey subsoil; on ridgetops, side slopes, and flood plains

This unit consists of narrow, gently sloping ridges with short, sloping side slopes and of narrow, nearly level flood plains. Slopes range from 0 to 15 percent. Intermittent and perennial streams form a dendritic drainage pattern. The native vegetation is dominantly pine and some hardwoods mainly along streams. Most of the cleared areas are on ridgetops and are used for peanuts, tobacco, corn, soybeans, and small grains.

This unit makes up about 20 percent of the survey area. The unit is about 18 percent Appling soils, 15 percent Roanoke soils, and 10 percent Mattaponi soils. The rest is mainly Craven, Dothan, Uchee, Louisburg, Helena, and Fluvanna soils.

The Appling soils are well drained and gently sloping and sloping. They are on ridgetops and side slopes and are underlain by granite and gneiss.

The Mattaponi soils are moderately well drained and gently sloping and sloping. They are on ridgetops and side slopes and are underlain by fluvial marine sediments.

The Roanoke soils are poorly drained and nearly level. They are along drainageways and are underlain by recent alluvial sediments.

The gently sloping soils in this unit are not used extensively for crops because most of the soils are severely eroded and require conservation practices to control erosion. Surface infiltration rates are slow in these soils. The soils in this unit are suitable for trees, and productivity is high, but the use of logging equipment is restricted on the poorly drained soils.

2. Fluvanna-Roanoke-Mattaponi

Nearly level to sloping, very deep, poorly drained to well drained, clayey soils; on ridgetops, side slopes, and flood plains

This unit consists of narrow, gently sloping ridges with short, sloping side slopes and of narrow, nearly level flood plains. Slopes range from 0 to 15 percent. Intermittent and perennial streams form a dendritic drainage pattern. The native vegetation is dominantly pine and some hardwoods mainly along streams. Most of the cleared areas are on ridgetops and are used for peanuts, tobacco, corn, soybeans, and small grains.

This unit makes up about 28 percent of the survey area. The unit is about 20 percent Fluvanna soils, 15 percent Roanoke soils, and 10 percent Mattaponi soils. The rest is mainly Craven, Emporia, Uchee, Georgeville, Iredell, and Goldston soils.

The Fluvanna soils are well drained and gently sloping and sloping. They are on ridgetops and side

slopes and are underlain by gabbro, diorite, and schist.

The Mattaponi soils are moderately well drained and gently sloping and sloping. They are on ridgetops and side slopes and are underlain by fluvial and marine sediments.

The Roanoke soils are poorly drained and nearly level. They are along drainageways and are underlain by recent alluvial sediments.

The gently sloping soils in this unit are not used extensively for crops because most of the soils are severely eroded and require conservation practices to control erosion. Surface infiltration rates are slow in these soils. The soils in this unit are suitable for trees, and productivity is high, but the use of logging equipment is restricted on the poorly drained soils.

3. Woodington-Slagle-Emporia

Nearly level and gently sloping, very deep, poorly drained to well drained, loamy soils; on flood plains, in upland depressions, and on upland flats

This unit consists of broad upland depressions and upland flats and narrow flood plains. Slopes range from 0 to 7 percent. Intermittent and perennial streams form a dendritic drainage pattern. The native vegetation is dominantly pine and hardwoods. Most of the cleared areas are on upland flats and are used for peanuts, corn, soybeans, and small grains.

This unit makes up about 23 percent of the survey area. The unit is about 30 percent Woodington soils, 20 percent Slagle soils, and 15 percent Emporia soils. The rest is mainly Craven, Uchee, Mattaponi, and Roanoke soils.

The Woodington soils are poorly drained and nearly level. They are in upland depressions and on flood plains and are underlain by fluvial and marine sediments.

The Slagle soils are moderately well drained and gently sloping. They are in upland depressions and on upland flats and are underlain by fluvial and marine sediments.

The Emporia soils are well drained and gently sloping. They are on upland flats and are underlain by fluvial and marine sediments.

The nearly level soils in this unit are not used extensively for crops because they are in low areas and are poorly drained. Artificial drainage is difficult to establish because of the lack of outlets. The soils in this unit are moderately suitable for trees. Productivity is high, but plant nutrient levels are low for trees and wetness restricts the use of logging equipment.

4. Peawick-Roanoke-Altavista

Nearly level and gently sloping, very deep, poorly drained to moderately well drained, clayey and loamy soils; in terrace depressions and on terrace flats

This unit consists of broad terrace depressions and flats and narrow flood plains (fig. 2). Slopes range from 0 to 7 percent. Intermittent and perennial streams form a dendritic drainage pattern. The native vegetation is dominantly pine and hardwoods. Most of the cleared areas are on terrace flats and are used for peanuts, corn, soybeans, and small grains.

This unit makes up about 11 percent of the survey area. The unit is about 35 percent Peawick soils, 20 percent Roanoke soils, and 15 percent Altavista soils. The rest is mainly State and Wickham soils.

The Peawick soils are on terrace flats. They are nearly level and moderately well drained and have a clayey subsoil. They are underlain by fluvial sediments derived from igneous and metamorphic rock of the Piedmont province.

The Roanoke soils are in depressions and along drainageways. They are nearly level and poorly drained and have a clayey subsoil. They are underlain by fluvial sediments derived from igneous and metamorphic rock of the Piedmont province.

The Altavista soils are on terrace flats. They are nearly level and moderately well drained and have a loamy subsoil. They are underlain by fluvial sediments derived from igneous and metamorphic rock of the Piedmont province.

The poorly drained soils in this unit are not used extensively for crops. Artificial drainage is difficult to establish because of the lack of outlets. The soils in this unit are suitable for trees. Productivity is very high, and plant nutrient levels are adequate, but wetness restricts the use of logging equipment.

5. Roanoke-Altavista

Nearly level, very deep, poorly drained to moderately well drained soils with a clayey or loamy subsoil; on flood plains

This unit consists of broad flood plains with large meander scrolls that form point bars bordered by natural levees. Slopes range from 0 to 2 percent. The native vegetation is dominantly hardwoods and pine. Most of the cleared areas are on point bars and are used for peanuts, corn, soybeans, and small grains.

This unit makes up 18 percent of the survey area. The unit is about 60 percent Roanoke soils and 10

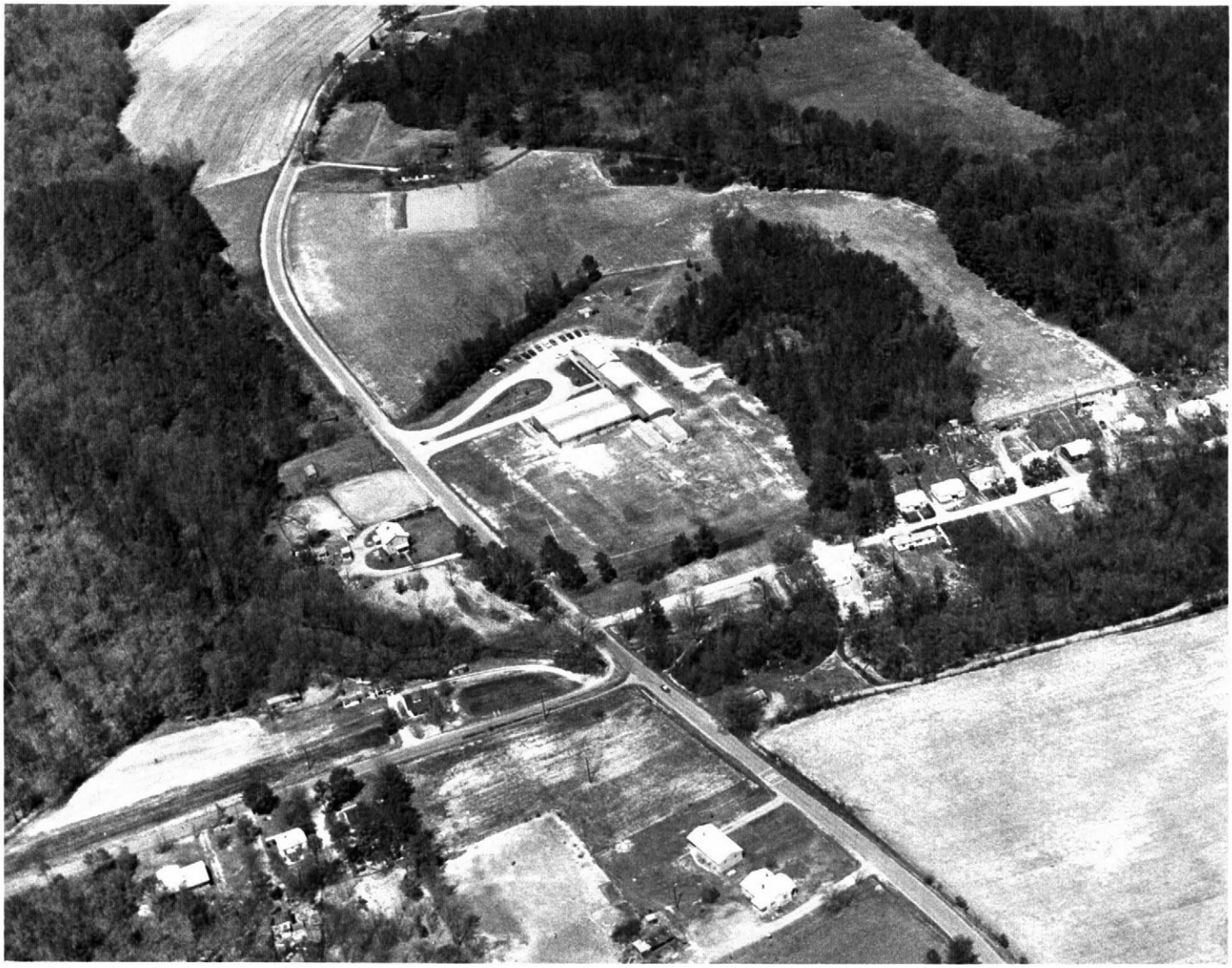

Figure 2.—An area in the Peawick-Roanoke-Altavista general soil map unit.

percent Altavista soils. The rest is mainly Wickham, Bojac, Riverview, Chenneby, and Tarboro soils.

The Roanoke soils are in meander scrolls. They are poorly drained and have a clayey subsoil. They are underlain by fluvial sediments derived from igneous and metamorphic rock of the Piedmont province.

The Altavista soils are on point bars. They are moderately well drained and have a loamy subsoil. They are underlain by fluvial sediments derived from igneous and metaphoric rock of the Piedmont province.

The poorly drained soils in this unit are not used extensively for crops. Artificial drainage is difficult to establish because of the lack of outlets. The soils in this unit are suitable for trees. Productivity is very high, and plant nutrient levels are adequate, but wetness restricts the use of logging equipment.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil 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 or of the underlying material, 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 or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, 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, Appling gravelly coarse sandy loam, 2 to 7 percent slopes, is one of several phases in the Appling series.

Some map units are made up of two or more major soils. These map units are called soil complexes.

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Fluvanna-Mattaponi complex, 2 to 7 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, quarry, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 7 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of 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.

Soil Descriptions

1B—Abell loam, 2 to 7 percent slopes. This soil is gently sloping, very deep, and moderately well drained. It is on toe slopes, in saddles, and along drainageways in the western part of the county. The areas range from about 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 1 inch, very dark grayish brown loam
Subsurface layer:
1 to 9 inches, light yellowish brown loam
Subsoil:
9 to 14 inches, yellowish brown loam
14 to 28 inches, yellowish brown clay loam and light yellowish brown and light gray mottles
28 to 40 inches, yellowish brown clay loam and yellowish red, light yellowish brown, and light gray mottles

Substratum:
40 to 65 inches, brownish yellow, light gray, and red sandy loam

Included with soil in mapping are small areas of well drained Fluvanna soils, shallow Goldston soils, and poorly drained Roanoke soils. The Fluvanna and Goldston soils are on the higher areas. The Roanoke soils are on the lower areas. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Fair.
Depth to bedrock: More than 60 inches.
Depth to the water table: 24 to 40 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans and corn, are well suited to this soil. Crops respond well to fertilizer, but response to lime is limited because of a high content of exchangeable aluminum in the subsoil. A starter application of a complete fertilizer is needed, and split applications of nitrogen are needed for crops requiring nitrogen fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes help to improve tilth, reduce runoff, and control erosion. Small grains tend to lodge on this soil.

Pasture grasses and legumes are well suited to this soil. The main pasture management practices are maintaining a mixture of grasses and legumes, using rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 130 cubic feet. Timber is easily managed on this soil.

Wetness limits this soil as a site for septic tank absorption fields, dwellings with and without basements, and local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIe.

2A—Altavista fine sandy loam, 0 to 3 percent slopes. This soil is nearly level, very deep, and moderately well drained. It is on stream terraces primarily in the Low Ground section of the county and around Jarratt. The areas range from about 5 to 200 acres.

The typical sequence, depth, and composition of the layers of the soil are as follows—

Surface layer:
0 to 7 inches, grayish brown fine sandy loam
Subsurface layer:
7 to 10 inches, light yellowish brown fine sandy loam
Subsoil:
10 to 17 inches, olive yellow clay loam
17 to 30 inches, yellowish brown clay loam
30 to 50 inches, brownish yellow sandy clay loam with light gray mottles
Substratum:
50 to 68 inches, mottled light gray and reddish yellow clay

Included with this soil in mapping are small areas of poorly drained Roanoke soils and well drained State soils. The Roanoke soils are on the lower areas. The State soils are on stream terraces. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 18 to 30 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially soybeans and corn, are well suited to this soil. Crops respond to lime and fertilizer, especially to a starter application of a complete fertilizer, and split applications of nitrogen are needed for crops requiring nitrogen. When wet, this soil adheres to peanuts at harvesting, resulting in broken

pegs, reduced yields, and lower grades. Small grains tend to lodge on this soil.

Pasture grasses and legumes are well suited to this soil. The main pasture management practices are maintaining a mixture of grasses and legumes, using rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 150 cubic feet. Wetness limits the use of equipment for managing timber.

Wetness limits this soil as a site for septic tank absorption fields, dwellings with and without basements, and local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIw.

3A—Altavista fine sandy loam, 0 to 2 percent slopes, frequently flooded. This soil is nearly level, very deep, and moderately well drained. It is on point bars of flood plains primarily along the Meherrin River and Fountain Creek. The areas range from about 5 to 60 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 12 inches, dark brown and light yellowish brown fine sandy loam
Subsoil:
12 to 28 inches, olive yellow and yellowish brown sandy clay loam
28 to 42 inches, mottled light gray and brownish yellow sandy clay loam
Substratum:
42 to 68 inches, mottled light gray and very pale brown gravelly coarse sand

Included with this soil in mapping are small areas of poorly drained Roanoke soils, somewhat excessively drained Tarboro soils, and well drained Wickham soils. The Roanoke soils are on the lower areas. The Tarboro and Wickham soils are on point bars. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low to moderate.
Natural fertility: Low.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 18 to 30 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially soybeans and corn, are well suited to this soil. Crop production is limited by flooding during the growing season and by weed competition, especially from Johnsongrass. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. When wet, this soil adheres to peanuts at harvesting, resulting in broken pegs, reduced yields, and lower grades. Small grains tend to lodge on this soil.

Pasture grasses and legumes are well suited to this soil. Flooding and weed competition are the main limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, using rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 150 cubic feet. Wetness and flooding limit the use of equipment for managing timber.

Flooding and wetness limit this soil as a site for septic tank absorption fields, dwellings with and without basements, and local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIw.

4B3—Appling sandy clay loam, 2 to 7 percent slopes, severely eroded. This soil is gently sloping, very deep, and well drained. It is on ridgetops primarily in the southwest part of the county. Shallow and deep gullies are in some areas. The areas of this soil range from about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, brown sandy clay loam
Subsoil:
4 to 30 inches, yellowish red clay
30 to 42 inches, yellowish red clay loam
Substratum:
42 to 64 inches, yellowish red saprolite that has a

sandy loam texture and reddish yellow mottles

Included with this soil in mapping are small areas of coarse textured Louisburg soils and moderately well drained Mattaponi soils on ridgetops. Soils with a surface layer of gravelly coarse sandy loam and areas with rock outcrop are in some units. Included areas make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, such as small grains, soybeans, and corn, are moderately well suited to this soil. The permeability, organic matter content, and available water capacity are the main limitations. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. The clay in the surface layer is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, using rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on this soil.

The permeability limits this soil as a site for septic tank absorption fields, but this can be overcome by increasing the size of the absorption field. This soil is suitable as a site for dwellings with and without basements and for area sanitary landfills, but low strength limits the soil as a site for local roads and streets.

The capability subclass is IIIe.

4C3—Appling sandy clay loam, 7 to 15 percent slopes, severely eroded. This soil is strongly sloping, very deep, and well drained. It is on side slopes primarily in the southwest part of the county. Shallow and deep gullies are in some areas. The areas of this soil range from about 2 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, brown sandy clay loam
Subsoil:
4 to 30 inches, yellowish red clay
30 to 42 inches, yellowish red clay loam
Substratum:
42 to 64 inches, yellowish red saprolite that has a sandy loam texture and reddish yellow mottles

Included with this soil in mapping are small areas of coarser textured Louisburg soils and moderately well drained Mattaponi soils on side slopes. Soils with a surface layer of gravelly coarse sandy loam and steeper areas and rock outcrops are in some areas. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, such as small grains, soybeans, and corn, are moderately well suited to this soil. The permeability, organic matter content, and available water capacity are the main limitations. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. The clay in the surface layer is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes using rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on this soil.

The permeability and slope limit this soil as a site for septic tank absorption fields, but the permeability can be overcome by expanding the absorption field. Slope limits the soil as a site for dwellings with and without basements, and slope and low strength limit it as a site for local roads and streets.

The capability subclass is IVe.

5B—Appling gravelly coarse sandy loam, 2 to 7 percent slopes. This soil is gently sloping, very deep, and well drained. It is on ridgetops primarily in the southwest part of the county. The areas range from about 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 1 inch, dark grayish brown gravelly coarse sandy loam
Subsurface layer:
1 to 12 inches, light yellowish brown gravelly coarse sandy loam
Subsoil:
12 to 24 inches, yellowish red clay
24 to 30 inches, yellowish red clay with light yellowish brown mottles
30 to 43 inches, yellowish red clay with reddish yellow mottles
Substratum:
43 to 63 inches, yellowish red saprolite that has a sandy loam texture and reddish yellow mottles

Included with this soil in mapping are small areas of coarser textured Louisburg soils and moderately well drained Mattaponi soils on side slopes. Soils with a surface layer of gravelly coarse sandy loam and steeper areas and rock outcrops are in some areas. Included soils make up about 20 percent of this unit.

Major soil properties—
Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to this soil. The clay in the subsoil limits the root zone. Crops on this soil respond well to lime and fertilizer, especially to starter applications of complete fertilizers and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes will help reduce runoff and control erosion.

Pasture grasses and legumes are well suited to this soil. The main pasture management practices are maintaining a mixture of grasses and legumes, using rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on this soil.

The permeability limits this soil as a site for septic tank absorption fields, but this can be overcome by increasing the size of the absorption field. This soil is suitable as a site for dwellings with and without basements and for area sanitary landfills. Low strength limits this soil as a site for local roads and streets.

The capability subclass is IIs.

6B—Appling-Louisburg complex, 2 to 7 percent slopes. This unit consists of gently sloping, well drained soils on ridgetops primarily in the southwest part of the county. The areas range from about 5 to 50 acres. They are about 45 percent very deep Appling soils, 40 percent deep and very deep Louisburg soils, and 15 percent included soils. The soils are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Appling soil are as follows—

Surface layer:
0 to 1 inch, dark grayish brown gravelly coarse sandy loam
Subsurface layer:
1 to 12 inches, light yellowish brown gravelly coarse sandy loam
Subsoil:
12 to 24 inches, yellowish red clay
24 to 30 inches, yellowish red clay with light yellowish brown mottles
30 to 43 inches, yellowish red clay with reddish yellow mottles
Substratum:
43 to 63 inches, yellowish red saprolite with a sandy loam texture and reddish yellow mottles

The typical sequence, depth, and composition of the layers of the Louisburg soil are as follows—

Surface layer:
0 to 5 inches, dark grayish brown gravelly coarse sandy loam
Subsurface layer:
5 to 11 inches, yellowish brown gravelly coarse sandy loam
Subsoil:
11 to 24 inches, brownish yellow gravelly coarse sandy loam interrupted by lenses and irregularly shaped bodies of yellowish brown gravelly sandy clay loam
Substratum:
24 to 60 inches, brownish yellow and strong brown saprolite that has a gravelly coarse sandy loam texture

Included with this unit in mapping are small areas of moderately well drained Helena and Mattaponi soils. The Helena soils are on the lower areas. The Mattaponi soils are on ridgetops. Soils with a surface layer of sandy clay loam and areas with stones and rock outcrops are in some units.

Major properties of the Appling soil—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

Major soil properties of the Louisburg soil—

Permeability: Rapid.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 40 inches.
Depth to the water table: More than 72 inches.
Root zone: More than 40 inches.
Shrink-swell potential: Very low.

These soils are used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are moderately well suited to these soils. The depth to bedrock in the Louisburg soil limits the root zone. The Appling soil is moderately droughty, and the Louisburg soil is droughty. Crops on these soils respond well to lime and fertilizer, especially to starter applications of complete plant nutrients and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes help to reduce runoff and control erosion.

Pasture grasses and legumes are moderately well suited to these soils. Low available water capacity in the Louisburg soil is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, using rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on these soils is high. The estimated annual production of wood per acre is 110 cubic feet on the Appling soil and 105 cubic feet on the Louisburg soil. Timber is easily managed on these soils.

The permeability in the Appling soil and the depth to rock in the Louisburg soil limit the unit as a site for septic tank absorption fields. The permeability can be overcome by expanding the absorption field. These soils are suitable as sites for dwellings without basements, but the depth to rock in the Louisburg soil is a limitation for dwellings with basements. Low strength in the Appling soil limits the unit as a site for local roads and streets.

The capability subclass is IVs.

6C—Appling-Louisburg complex, 7 to 15 percent slopes. This unit consists of strongly sloping, well drained soils on side slopes primarily in the southwest part of the county. The areas range from about 5 to 60 acres. They are about 45 percent very deep Appling soils, 40 percent deep and very deep Louisburg soils, and 15 percent included soils. These soils are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Appling soil are as follows—

Surface layer:
0 to 1 inch, dark grayish brown gravelly coarse sandy loam
Subsurface layer:
1 to 12 inches, light yellowish brown gravelly coarse sandy loam
Subsoil:
12 to 24 inches, yellowish red clay
24 to 30 inches, yellowish red clay with light yellowish brown mottles
30 to 43 inches, yellowish red clay with reddish yellow mottles
Substratum:
43 to 63 inches, yellowish red saprolite with a sandy loam texture and reddish yellow mottles

The typical sequence, depth, and composition of the layers of the Louisburg soil are as follows—

Surface layer:
0 to 5 inches, dark grayish brown gravelly coarse sandy loam
Subsurface layer:
5 to 11 inches, yellowish brown gravelly coarse sandy loam
Subsoil:
11 to 24 inches, brownish yellow gravelly coarse sandy loam interrupted by lenses and irregularly shaped bodies of yellowish brown gravelly sandy clay loam
Substratum:
24 to 60 inches, brownish yellow and strong brown saprolite that has a gravelly coarse sandy loam texture

Included with this unit in mapping are small areas of moderately well drained Helena and Mattaponi soils. The Helena soils are on the lower areas. The Mattaponi soils are on side slopes. Soils with a surface layer of sandy clay loam and areas with stones, steeper slopes, and rock outcrops are in some units.

Major properties of the Appling soil—
Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

Major properties of the Louisburg soil—
Permeability: Rapid.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Rapid.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 40 inches.
Depth to the water table: More than 72 inches.
Root zone: More than 40 inches.
Shrink-swell potential: Very low.

These soils are used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are moderately well suited to these soils. The depth to bedrock in the Louisburg soil limits the root zone. The Appling soil is moderately droughty, and the Louisburg soil is droughty. Crops on these soils respond well to lime and fertilizer, especially to applications of complete plant nutrients and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes help to reduce runoff and control erosion.

Pasture grasses and legumes are poorly suited to these soils. Low available water capacity in the Louisburg soil is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on these

soils is high. The estimated annual production of wood per acre is 110 cubic feet on the Appling soil and 105 cubic feet on the Louisburg soil. Timber is easily managed on these soils.

Slope, the permeability in the Appling soil, and the depth to rock in the Louisburg soil limit the unit as a site for septic tank absorption fields. The permeability can be overcome by expanding the absorption field. Slope limits the unit as a site for dwellings without basements, and slope and the depth to rock in the Louisburg soil limit it as a site for dwellings with basements. Slope and the low strength in the Appling soil are limitations for local roads and streets.

The capability subclass is VIe.

7B—Appling-Mattaponi complex, 2 to 7 percent slopes. This unit consists of gently sloping, very deep soils on ridgetops primarily in the southwest part of the county. The areas range from about 5 to 40 acres. They are about 45 percent well drained Appling soils, 35 percent moderately well drained Mattaponi soils, and 20 percent included soils and rock outcrops. These soils are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Appling soil are as follows—

Surface layer:
0 to 1 inch, dark grayish brown gravelly coarse sandy loam
Subsurface layer:
1 to 12 inches, light yellowish brown gravelly coarse sandy loam
Subsoil:
12 to 24 inches, yellowish red clay
24 to 30 inches, yellowish red clay with light yellowish brown mottles
30 to 43 inches, yellowish red clay with reddish yellow mottles
Substratum:
43 to 63 inches, yellowish red saprolite with a sandy loam texture and reddish yellow mottles

The typical sequence, depth, and composition of the layers of the Mattaponi soil are as follows—

Surface layer:
0 to 4 inches, dark grayish brown sandy loam
Subsurface layer:
4 to 15 inches, light yellowish brown sandy loam
Subsoil:
15 to 28 inches, yellowish brown clay loam
28 to 41 inches, yellowish brown clay
41 to 51 inches, yellowish brown clay with red mottles
51 to 60 inches, mottled red, yellowish brown, and light gray sandy clay
Substratum:
60 to 69 inches, mottled red, brownish yellow, and light gray sandy clay loam

Included with this unit in mapping are small areas of moderately well drained Abell soils on lower areas and coarser textured Louisburg soils on ridgetops. Soils with a surface layer of sandy clay loam and areas with stones on the surface are in some units.

Major properties of the Appling soil—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

Major properties of the Mattaponi soil—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 36 to 72 inches.
Root zone: More than 48 inches.
Shrink-swell potential: Moderate.

These soils are used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to these soils. Crops on these soils respond well to lime and fertilizer, especially to side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes help to reduce runoff and control erosion.

Pasture grasses and legumes are well suited to these soils. Restricted root growth is a limitation. The

main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on these soils is high. The estimated annual production of wood per acre on the Appling and Mattaponi soils is 110 cubic feet. Timber is easily managed on these soils.

The permeability in the Appling soil and the wetness and permeability in the Mattaponi soil limit their suitability for septic tank absorption fields. The Appling soil is suitable as a site for dwellings with and without basements. The shrink-swell potential limits the Mattaponi soil as a site for dwellings without basements, and the wetness and shrink-swell in the Mattaponi soil are limitations for dwellings with basements. Low strength in these soils is a limitation for local roads and streets. These soils are suited to area-type sanitary landfills.

The capability subclass is IIe.

7C—Appling-Mattaponi complex, 7 to 15 percent slopes. This unit consists of strongly sloping, very deep soils on side slopes primarily in the southwest part of the county. The areas range from about 5 to 40 acres. They are about 45 percent well drained Appling soils, 35 percent moderately well drained Mattaponi soils, and 20 percent included soils and rock outcrops. The soils are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Appling soil are as follows—

Surface layer:
0 to 1 inch, dark grayish brown gravelly coarse sandy loam
Subsurface layer:
1 to 12 inches, light yellowish brown gravelly coarse sandy loam
Subsoil:
12 to 24 inches, yellowish red clay
24 to 30 inches, yellowish red clay with light yellowish brown mottles
30 to 43 inches, yellowish red clay with reddish yellow mottles
Substratum:
43 to 63 inches, yellowish red saprolite with a sandy loam texture and reddish yellow mottles

The typical sequence, depth, and composition of the layers of the Mattaponi soil are as follows—

Surface layer:
0 to 4 inches, dark grayish brown sandy loam
Subsurface layer:
4 to 15 inches, light yellowish brown sandy loam
Subsoil:
15 to 28 inches, yellowish brown clay loam
28 to 41 inches, yellowish brown clay
41 to 51 inches, yellowish brown clay with red mottles
51 to 60 inches, mottled red, yellowish brown, and light gray sandy clay
Substratum:
60 to 69 inches, mottled red, brownish yellow, and light gray sandy clay loam

Included with this soil in mapping are small areas of moderately well drained Abell soils on the lower areas and coarser textured Louisburg soils on side slopes. Soils with a surface layer of sandy clay loam and areas with stones on the surface or steeper slopes are in some units.

Major properties of the Appling soil—
Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

Major properties of the Mattaponi soil—
Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 36 to 72 inches.
Root zone: More than 48 inches.
Shrink-swell potential: Moderate.

These soils are used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are moderately well suited to these soils. The Mattaponi soil has firm and compact layers at a depth of 48 inches. Crops on these soils respond well to lime and fertilizer, especially to starter applications of complete plant nutrients and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes help to reduce runoff and control erosion.

Pasture grasses and legumes are well suited to these soils. Restricted root growth is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on these soils is high. The estimated annual production of wood per acre on the Appling and Mattaponi soils is 110 cubic feet. Timber is easily managed on these soils.

Slope, the permeability in the Appling soil, and the wetness and permeability in the Mattaponi soil limit the unit as a site for septic tank absorption fields. Slope is a limitation for dwellings with and without basements, and the shrink-swell potential in the Mattaponi soil limits the unit as a site for dwellings without basements. Wetness and the shrink-swell potential in the Mattaponi soil are limitations for dwellings with basements. Slope and low strength limit the unit as a site for local roads and streets.

The capability subclass is IIIe.

8A—Bojac loamy fine sand, 0 to 2 percent slopes, frequently flooded. This soil is nearly level, very deep, and well drained. It is on flood plains primarily along the Meherrin River and Fountain Creek.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, brown loamy fine sand
Subsoil:
8 to 13 inches, yellowish brown fine sandy loam with dark yellowish brown mottles
13 to 25 inches, yellowish brown fine sandy loam
25 to 37 inches, strong brown fine sandy loam
37 to 47 inches, yellowish brown fine sandy loam with very pale brown mottles
Substratum:
47 to 70 inches, very pale brown loamy fine sand
70 to 85 inches, yellow coarse sand with yellowish brown mottles

Included with this soil in mapping are small areas of poorly drained Roanoke soils on the lower areas and finer textured Wickham soils and coarser textured Tarboro soils on flood plains. This unit is about 20 percent included soils.

Major soil properties—
Permeability: Moderately rapid.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid to slightly acid.
Surface runoff: Slow.
Erosion hazard: Slight by water; moderate by wind.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 48 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially peanuts, corn, and soybeans, are well suited to this soil. Frequent flooding causes crop losses in some years, and crop production is limited by weed competition. Crops on this soil respond well to lime and fertilizer, especially to starter applications of complete fertilizers and split applications of nitrogen.

Pasture grasses and legumes are moderately well suited to this soil. Flooding and weed competition are limitations. The main management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Flooding limits use of equipment for managing timber. The sand in the surface layer limits seedling survival.

Flooding limits this soil as a site for septic tank absorption fields, dwellings with and without basements, and local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIw.

9A—Chenneby silt loam, 0 to 2 percent slopes, frequently flooded. This soil is nearly level, very deep, and somewhat poorly drained. It is on flood plains primarily along the Meherrin and Nottoway Rivers. The areas range from about 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches, dark yellowish brown silt loam
Subsoil:
3 to 13 inches, brown silt loam
13 to 20 inches, dark brown silt loam
20 to 32 inches, brown, grayish brown, and black silty clay loam
32 to 47 inches, brown, light gray, and black silty clay loam
Substratum:
47 to 62 inches, light gray, brown, and black loam

Included with this soil in mapping are small areas of well drained Riverview soils and somewhat excessively drained Tarboro soils on the higher areas and poorly drained Roanoke soils on the lower areas. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: High.
Organic matter content: Low to high.
Natural fertility: Low to medium.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Fair.
Depth to bedrock: More than 60 inches.
Depth to the water table: 12 to 30 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops are poorly suited to this soil. Flooding and wetness are the major limitations. If crops are grown, they respond well to lime and fertilizer.

Pasture grasses and legumes are well suited to this soil. Flooding, weed competition, and wetness are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 155 cubic feet. Wetness and flooding limit the use of equipment for managing timber and limit seedling survival.

Flooding and wetness limit this soil as a site for septic tank absorption fields, dwellings, and local roads and streets. Low strength is also a limitation for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IVw.

10B3—Craven clay loam, 2 to 6 percent slopes, severely eroded. This soil is gently sloping, very deep, and moderately well drained. It is on ridgetops at an elevation of more than 100 feet. Shallow and deep gullies are in some delineations. The areas of this unit range from about 5 to 75 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, brown clay loam
Subsoil:
4 to 12 inches, yellowish brown clay with red and pale yellow mottles
12 to 28 inches, strong brown clay with red and gray mottles
28 to 35 inches, yellowish brown clay with red and gray mottles
35 to 42 inches, light gray sandy clay with red mottles
Substratum:
42 to 60 inches, light gray clay loam with dusky red and yellowish brown mottles

Included with this soil in mapping are small areas of well drained Appling and Uchee soils on ridgetops and poorly drained Roanoke soils on the lower areas. Soils with dense, compact layers in the subsoil and soils with a cobbly surface layer are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: 24 to 36 inches.
Root zone: More than 20 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, such as small grains, soybeans, and corn, are moderately well suited to this soil. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes help to improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. The clay in the surface layer and a restricted root zone are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Wetness and clay in the surface layer limit the use of equipment for managing timber and limit seedling survival.

The permeability and wetness limit this soil as a site for septic tank absorption fields. The shrink-swell potential limits it as a site for dwellings without basements, and wetness limits it for dwellings with basements. Low strength is a limitation for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is VIe.

10C3—Craven clay loam, 6 to 12 percent slopes, severely eroded. This soil is strongly sloping, very deep, and moderately well drained. It is on side slopes at an elevation of more than 100 feet. Shallow and deep gullies are in some delineations. The areas of this unit range from about 5 to 65 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, brown clay loam
Subsoil:
4 to 12 inches, yellowish brown clay with red and pale yellow mottles
12 to 28 inches, strong brown clay with red and gray mottles
28 to 35 inches, yellowish brown clay with red and gray mottles
35 to 42 inches, light gray sandy clay with red mottles
Substratum:
42 to 60 inches, light gray clay loam with dusky red and yellowish brown mottles

Included with this soil in mapping are small areas of well drained Appling and Uchee soils on ridgetops and poorly drained Roanoke soils on the lower areas. Soils with dense, compact layers in the subsoil and soils with a cobbly surface layer are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: 24 to 36 inches.
Root zone: More than 20 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, such as small grains, soybeans, and corn, are moderately well suited to this soil. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes help to improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are poorly suited to this soil. The clay in the surface layer and restricted root growth are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Wetness and the clay in the surface layer limit the use of equipment for managing timber and limit seedling survival.

The permeability, slope, and wetness limit this soil as a site for septic tank absorption fields. The shrink-swell potential and slope limit the soil as a site for dwellings without basements, and wetness and slope limit it as a site for dwellings with basements. Low strength and

slope are limitations for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is VIe.

11A—Dothan loamy sand, 0 to 2 percent slopes. This soil is nearly level, very deep, and well drained. It is on broad upland flats at an elevation of more than 170 feet. The areas range from about 5 to 75 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 9 inches, brown loamy sand
Subsurface layer:
9 to 17 inches, pale brown sandy loam
Subsoil:
17 to 31 inches, yellowish brown sandy clay loam
31 to 44 inches, yellowish brown sandy clay loam with red mottles
44 to 63 inches, yellowish brown sandy clay with light gray and dark red mottles
63 to 78 inches, yellowish brown sandy clay loam with red and light gray mottles

Included with this soil in mapping are small areas of moderately well drained Craven and Mattaponi soils on the steeper areas and Orangeburg soils on upland flats. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Slow.
Erosion hazard: Slight by water; moderate by wind.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 36 to 60 inches.
Root zone: More than 40 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially peanuts, corn, tobacco, and soybeans, are well suited to this soil. The soil is droughty during extended dry periods. Crops on this soil respond well to lime and fertilizer, especially to starter applications of complete fertilizers and split applications of nitrogen, but fertilizer and lime and seasonal moisture changes produce fluctuations in available plant nutrients in the surface layer. Cover crops reduce wind erosion and increase the organic matter content.

Pasture grasses and legumes are well suited to this soil. Restricted root growth is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 100 cubic feet. The sand in the surface layer limits seedling survival.

Wetness and the permeability limit this soil as a site for septic tank absorption fields. Wetness limits the soil as a site for dwellings with basements. This soil is suitable as a site for dwellings without basements, local roads and streets, and area-type sanitary landfills.

The capability class is I.

12B—Emporia loamy fine sand, 2 to 6 percent slopes. This soil is gently sloping, very deep, and well drained. It is on knolls and ridgetops at an elevation of more than 100 feet. The areas range from about 5 to 150 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches, pale brown loamy fine sand
Subsurface layer:
6 to 15 inches, pale brown fine sandy loam
Subsoil:
15 to 32 inches, yellowish brown sandy clay loam with yellowish red mottles
32 to 44 inches, yellowish brown clay loam with red mottles
44 to 57 inches, yellowish brown sandy clay loam with light gray and yellowish red mottles
Substratum:
57 to 70 inches, yellow, light gray, and reddish brown sandy clay loam

Included with this soil in mapping are small areas of moderately well drained Craven soils and well drained Uchee soils. Soils with a surface layer of fine sandy loam or sandy clay loam are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow or slow.
Available water capacity: Moderate.
Organic matter content: Low or moderate.
Natural fertility: Low.

Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate by water and wind.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 36 to 54 inches.
Root zone: More than 45 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially peanuts, corn, tobacco, and soybeans, are well suited to this soil. This soil is droughty during extended dry periods. Crop production is limited by restricted root growth. Crops on this soil respond well to lime and fertilizer, especially to starter applications of complete fertilizers and split applications of nitrogen, but fertilizer and lime and seasonal moisture changes produce fluctuations in available plant nutrients in the surface layer. Cover crops reduce wind erosion and increase the organic matter content.

Pasture grasses and legumes are well suited to this soil. Restricted root growth is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 100 cubic feet. The sand in the surface layer limits seedling survival.

Wetness and the permeability limit the soil as a site for septic tank absorption fields. Wetness and the shrink-swell potential limit it as a site for dwellings with basements. Low strength limits the soil for local roads and streets. This soil is suitable as a site for dwellings without basements and for area-type sanitary landfills. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIe.

13A—Faceville loamy sand, 0 to 2 percent slopes. This soil is nearly level, very deep, and well drained. It is on broad upland flats at an elevation of more than 170 feet. The areas range from about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, yellowish brown loamy sand
Subsurface layer:
8 to 11 inches, light yellowish brown sandy loam
Subsoil:
11 to 44 inches, yellowish red sandy clay
44 to 57 inches, red sandy clay with reddish yellow and brownish yellow mottles
57 to 68 inches, red sandy clay with reddish yellow, brownish yellow, and very pale brown mottles

Included with this soil in mapping are small areas of Dothan soils on upland flats and coarser textured Uchee soils on steeper areas. Included soils make up about 20 percent of this unit.

Major soil properties—
Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Slow.
Erosion hazard: Slight by water; moderate by wind.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially peanuts, corn, tobacco, and soybeans, are well suited to this soil. This soil is droughty during extended dry periods. Crop production is limited by restricted root growth. Crops on this soil respond well to lime and fertilizer, especially to starter applications of complete fertilizers and split applications of nitrogen, but fertilizer and lime and seasonal moisture changes produce fluctuations in available plant nutrients in the surface layer. Cover crops reduce wind erosion and increase the organic matter content.

Pasture grasses and legumes are well suited to this soil. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 115 cubic feet. The sand in the surface layer limits seedling survival.

Low strength limits this soil as a site for local roads and streets. This soil is suited as a site for septic tank absorption fields, dwellings with and without basements, and area-type sanitary landfills.

The capability class is I.

14B—Fluvanna loam, 2 to 7 percent slopes. This soil is sloping, very deep, and well drained. It is on ridgetops in the western part of the county. The areas range from about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 1 inch, very dark grayish brown loam
Subsurface layer:
1 to 5 inches, yellowish brown loam
Subsoil:
5 to 11 inches, strong brown clay loam with yellowish brown mottles
11 to 23 inches, strong brown clay with yellowish red mottles
23 to 44 inches, yellowish red clay with strong brown mottles
44 to 55 inches, yellowish red silty clay with brownish yellow and dark red mottles
Substratum:
55 to 70 inches, mottled dark red, yellowish red, and brownish yellow silty clay loam
70 to 99 inches, mottled brownish yellow, black, and dark red silty clay loam

Included with this soil in mapping are small areas of shallow Goldston soils and moderately well drained Mattaponi soils on ridgetops and somewhat poorly drained Iredell soils on the lower areas. Soils with a surface layer of clay loam or a cobbly surface layer and areas of rock outcrops are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low to moderate.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Fair.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to this soil. The clay in the subsoil limits the root zone. Crops on this soil respond well to lime and fertilizer, especially to applications of complete fertilizers and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes will help reduce runoff and control erosion.

Pasture grasses and legumes are well suited to this soil. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on this soil.

Permeability limits this soil as a site for septic tank absorption fields. The shrink-swell potential limits the soil as a site for dwellings with and without basements, and low strength limits it as a site for local roads and streets. This soil is suitable for area-type sanitary landfills.

The capability subclass is IIe.

15B3—Fluvanna clay loam, 2 to 7 percent slopes, severely eroded. This soil is gently sloping, very deep, and well drained. It is on ridgetops in the western part of the county. Shallow and deep gullies are in some areas. The areas of this unit range from about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, brown clay loam
Subsoil:
4 to 11 inches, strong brown clay loam with yellowish brown mottles
11 to 23 inches, strong brown clay with yellowish red mottles
23 to 46 inches, yellowish red clay with strong brown mottles
Substratum:
46 to 60 inches, mottled dark red, yellowish red, and brownish yellow silty clay loam

Included with this soil in mapping are small areas of shallow Goldston soils and moderately well drained Mattaponi soils on ridgetops and somewhat poorly drained Iredell soils on the lower areas. Soils with a surface layer of loam or a cobbly surface layer and areas with rock outcrops are in some units. Included

soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, such as small grains, soybeans, and corn, are moderately well suited to this soil. The permeability, organic matter content, and available water capacity are the main limitations. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. The clay in the surface layer is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, using rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on this soil.

The permeability limits this soil as a site for septic tank absorption fields, and the shrink-swell potential limits it as a site for dwellings with and without basements. Low strength is a limitation for local roads and streets. This soil is suited to area-type sanitary landfills.

The capability subclass is IIIe.

15C3—Fluvanna clay loam, 7 to 15 percent slopes, severely eroded. This soil is strongly sloping, very deep, and well drained. It is on side slopes in the western part of the county. Shallow and deep gullies are in some areas. The areas of this soil range from about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, brown clay loam
Subsoil:
4 to 11 inches, strong brown clay loam with yellowish brown mottles
11 to 23 inches, strong brown clay with yellowish red mottles
23 to 46 inches, yellowish red clay with strong brown mottles
Substratum:
46 to 60 inches, mottled dark red, yellowish red, and brownish yellow silty clay loam

Included with this soil in mapping are small areas of shallow Goldston soils and moderately well drained Mattaponi soils on side slopes and somewhat poorly drained Iredell soils on the lower areas. Soils with a surface layer of loam or a cobbly surface layer and areas with steeper slopes and rock outcrops are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, such as small grains, soybeans, and corn, are moderately well suited to this soil. The permeability, organic matter content, and available water capacity are the main limitations. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well

suited to this soil. The clay in the surface layer is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, using rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on this soil.

The permeability and slope limit this soil as a site for septic tank absorption fields. The shrink-swell potential and slope limit it as a site for dwellings with and without basements. Low strength and slope are limitations for local roads and streets.

The capability subclass is IVe.

16B3—Fluvanna-Goldston complex, 2 to 7 percent slopes, severely eroded. This unit consists of gently sloping, well drained soils on ridgetops in the southwest part of the county. Shallow and deep gullies are in some units. The areas of the unit range from about 5 to 40 acres. They are about 45 percent very deep Fluvanna soils, 30 percent shallow Goldston soils, and 25 percent included soils and rock outcrops. The soils are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Fluvanna soil are as follows—

Surface layer:
0 to 4 inches, brown clay loam
Subsoil:
4 to 11 inches, strong brown clay loam with yellowish brown mottles
11 to 23 inches, strong brown clay with yellowish red mottles
23 to 46 inches, yellowish red clay with strong brown mottles
Substratum:
46 to 60 inches, mottled dark red, yellowish red, and brownish yellow silty clay loam

The typical sequence, depth, and composition of the layers of the Goldston soil are as follows—

Surface layer:
0 to 6 inches, grayish brown channery silt loam
Subsoil:
6 to 19 inches, light yellowish brown very channery silt loam
Substratum:
19 to 26 inches, light gray highly weathered slate fragments
Bedrock:
26 inches, hard slate

Included with these soils in mapping are small areas of somewhat poorly drained Iredell soils on the lower areas and moderately well drained Mattaponi soils on ridgetops. Soils with a surface layer of loam or a cobbly surface layer are in some units.

Major properties of the Fluvanna soil—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

Major properties of the Goldston soil—

Permeability: Moderately rapid.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low to medium.
Soil reaction: Extremely acid to moderately acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Poor.
Depth to bedrock: 10 to 20 inches.
Depth to the water table: More than 60 inches.
Root zone: 10 to 20 inches.
Shrink-swell potential: Low.

These soils are used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops are poorly suited to these soils. The main limitations are the restricted root growth, clay in the surface layer, low available water capacity, and rock fragments. Crops on these soils respond to lime and fertilizer. Clods form if these soils are worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help to improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to these soils. The restricted root growth, low available water capacity, rock fragments, and clay in the surface layer are limitations. The main management

practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on these soils is high. The estimated annual production of wood is 110 cubic feet per acre on the Fluvanna soil and 100 cubic feet per acre on the Goldston soil. The shallow depth to bedrock causes windthrow on the Goldston soil.

The permeability in the Fluvanna soil and the depth to rock in the Goldston soil are limitations for septic tank absorption fields. The shrink-swell potential in the Fluvanna soil and the depth to rock in the Goldston soil are limitations for dwellings with and without basements. Low strength in the Fluvanna soil and the depth to rock in the Goldston soil limit the soils as sites for local roads and streets.

The capability subclass is IVs.

16C3—Fluvanna-Goldston complex, 7 to 15 percent slopes, severely eroded. This unit consists of strongly sloping, well drained soils on side slopes in the southwest part of the county. Shallow and deep gullies are in some units. The areas of this unit range from about 5 to 50 acres. They are about 45 percent very deep Fluvanna soils, 30 percent shallow Goldston soils, and 25 percent included soils. The soils are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Fluvanna soil are as follows—

Surface layer:
0 to 4 inches, brown clay loam
Subsoil:
4 to 11 inches, strong brown clay loam with yellowish brown mottles
11 to 23 inches, strong brown clay with yellowish red mottles
23 to 46 inches, yellowish red clay with strong brown mottles
Substratum:
46 to 60 inches, mottled dark red, yellowish red, and brownish yellow silty clay loam

The typical sequence, depth, and composition of the layers of the Goldston soil are as follows—

Surface layer:
0 to 6 inches, grayish brown channery silt loam
Subsoil:
6 to 19 inches, light yellowish brown very channery silt loam
Substratum:
19 to 26 inches, light gray highly weathered slate fragments
Bedrock:
26 inches, hard slate

Included with these soils in mapping are small areas of somewhat poorly drained Iredell soils on the lower areas and moderately well drained Mattaponi soils on ridgetops. Soils with a surface layer of loam or a cobbly surface layer are in some units.

Major properties of the Fluvanna soil—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

Major properties of the Goldston soil—

Permeability: Moderately rapid.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low to medium.
Soil reaction: Extremely acid to moderately acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Poor.
Depth to bedrock: 10 to 20 inches.
Depth to the water table: More than 60 inches.
Root zone: 10 to 20 inches.
Shrink-swell potential: Low.

Cultivated crops are generally unsuited to these soils. Crop production is limited by restricted root growth, clay loam in the surface layer, slope, low available water capacity in the Goldston soil, and rock fragments.

Pasture grasses and legumes are poorly suited to these soils. Restricted root growth, clay loam in the surface layer, rock fragments, and the low available

water capacity are limitations. If these soils are pastured, the main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

These soils are used mainly for woodland. The potential productivity for loblolly pine is high. The estimated annual production of wood on this unit is 100 cubic feet per acre. The shallow depth to bedrock causes windthrow on the Goldston soil.

Slope, the permeability in the Fluvanna soil, and the depth to rock in the Goldston soil limit the unit as a site for septic tank absorption fields. Slope, the shrink-swell potential in the Fluvanna soil, and the depth to rock in the Goldston soil limit the unit as a site for dwellings with and without basements. Slope, low strength in the Fluvanna soil, and the depth to rock in the Goldston soil are limitations for local roads and streets.

The capability subclass is IVs.

17B—Fluvanna-Mattaponi complex, 2 to 7 percent slopes. This unit consists of gently sloping, very deep soils on ridgetops in the western part of the county. The areas range from about 5 to 25 acres. They are about 45 percent well drained Fluvanna soils, 35 percent moderately well drained Mattaponi soils, and 20 percent included soils. They are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Fluvanna soil are as follows—

Surface layer:
0 to 1 inch, very dark grayish brown fine sandy loam
Subsurface layer:
1 to 5 inches, yellowish brown fine sandy loam
Subsoil:
5 to 11 inches, strong brown clay loam with yellowish brown mottles
11 to 23 inches, strong brown clay with yellowish red mottles
23 to 44 inches, yellowish red clay with strong brown mottles
44 to 55 inches, yellowish red silty clay with brownish yellow and dark red mottles
Substratum:
55 to 70 inches, mottled dark red, yellowish red, and brownish yellow silty clay loam
70 to 99 inches, mottled brownish yellow, black, and dark red silty clay loam

The typical sequence, depth, and composition of the layers of the Mattaponi soil are as follows—

Surface layer:
0 to 4 inches, dark grayish brown sandy loam
Subsurface layer:
4 to 15 inches, light yellowish brown sandy loam
Subsoil:
15 to 28 inches, yellowish brown clay loam
28 to 41 inches, yellowish brown clay
41 to 51 inches, yellowish brown clay with red mottles
51 to 60 inches, mottled red, yellowish brown, and light gray sandy clay
Substratum:
60 to 69 inches, mottled red, brownish yellow, and light gray sandy clay loam

Included with this unit in mapping are small areas of shallow Goldston soils on ridgetops and somewhat poorly drained Iredell soils on the lower areas. Soils with a surface layer of clay loam or a gravelly or cobbly surface layer and areas of rock outcrop are in some units.

Major properties of the Fluvanna soil—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

Major properties of the Mattaponi soil—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 36 to 72 inches.
Root zone: More than 48 inches.
Shrink-swell potential: Moderate.

These soils are used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to these soils. The Mattaponi soil has firm and compact layers at a depth of 48 inches. Crops on these soils respond well to lime and fertilizer, especially to starter applications of complete plant nutrients and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes help to reduce runoff and control erosion.

Pasture grasses and legumes are well suited to these soils. Restricted root growth is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on these soils is high. The estimated annual production of wood per acre is 110 cubic feet. These soils are easily managed for timber.

Permeability and the wetness in the Mattaponi soil limit the unit as a site for septic tank absorption fields. The shrink-swell potential is a limitation for dwellings without basements, and it and the wetness in the Mattaponi soil are limitations for dwellings with basements. Low strength limits the unit as a site for local roads and streets. These soils are suitable for area-type sanitary landfills.

The capability subclass is IIe.

17C—Fluvanna-Mattaponi complex, 7 to 15 percent slopes. This unit consists of strongly sloping, very deep soils on side slopes in the western part of the county. Shallow and deep gullies are in some units. The areas of this unit range from about 5 to 40 acres. They are about 45 percent well drained Fluvanna soils, 35 percent moderately well drained Mattaponi soils, and 20 percent included soils and rock outcrops. They are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Fluvanna soil are as follows—

Surface layer:
0 to 1 inch, very dark grayish brown fine sandy loam
Subsurface layer:
1 to 5 inches, yellowish brown fine sandy loam
Subsoil:
5 to 11 inches, strong brown clay loam with yellowish brown mottles
11 to 23 inches, strong brown clay with yellowish red mottles
23 to 44 inches, yellowish red clay with strong brown mottles
44 to 55 inches, yellowish red silty clay with brownish yellow and dark red mottles
Substratum:
55 to 70 inches, mottled dark red, yellowish red, and brownish yellow silty clay loam
70 to 99 inches, mottled brownish yellow, black, and dark red silty clay loam

The typical sequence, depth, and composition of the layers of the Mattaponi soil are as follows—

Surface layer:
0 to 4 inches, dark grayish brown sandy loam
Subsurface layer:
4 to 15 inches, light yellowish brown sandy loam
Subsoil:
15 to 28 inches, yellowish brown clay loam
28 to 41 inches, yellowish brown clay
41 to 51 inches, yellowish brown clay with red mottles
51 to 60 inches, mottled red, yellowish brown, and light gray sandy clay
Substratum:
60 to 69 inches, mottled red, brownish yellow, and light gray sandy clay loam

Included with these soils in mapping are small areas of shallow Goldston soils on ridgetops and somewhat poorly drained Iredell soils on the lower areas. Soils with a surface layer of clay loam or a gravelly or cobbly surface layer and areas of rock outcrop are in some units.

Major properties of the Fluvanna soil—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low to moderate.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

Major properties of the Mattaponi soil—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 36 to 72 inches.
Root zone: More than 48 inches.
Shrink-swell potential: Moderate.

These soils are used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to these soils. The Mattaponi soil has firm and compact layers at a depth of 48 inches. Crops on these soils respond well to lime and fertilizer, especially to starter applications of complete plant nutrients and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes help to reduce runoff and control erosion.

Pasture grasses and legumes are moderately well suited to these soils. Restricted root growth is a limitation. The main management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on these soils is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on these soils.

Slope, the permeability, and the wetness in the Mattaponi soil limit the unit as a site for septic tank absorption fields. Slope and the shrink-swell potential are limitations for dwellings without basements, and they and the wetness in the Mattaponi soil are limitations for dwellings with basements. Slope and low strength are limitations for local roads and streets.

The capability subclass is IIIe.

18B—Georgeville loam, 2 to 7 percent slopes. This soil is gently sloping, very deep, and well drained. It is on ridgetops in the western part of the county. The areas range from about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, yellowish brown loam

Subsoil:
8 to 12 inches, yellowish red silty clay loam
12 to 25 inches, red clay
25 to 36 inches, red clay with brownish yellow mottles
36 to 45 inches, red silty clay with brownish yellow mottles

Substratum:
45 to 60 inches, mottled brownish yellow, red, white, and weak red loam

Included with this unit in mapping are small areas of shallow Goldston soils on ridgetops and somewhat poorly drained Iredell soils on the lower areas. Soils with a surface layer of sandy loam or clay loam or a sandy subsoil and areas with stones and boulders on the surface are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Fair.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to this soil. The clay in the subsoil limits the root zone. Crops on this soil respond well to lime and fertilizer, especially to applications of complete fertilizers and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes will help reduce runoff and control erosion.

Pasture grasses and legumes are well suited to this soil. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per

acre is 110 cubic feet. Timber is easily managed on this soil.

The permeability limits this soil as a site for septic tank absorption fields, but this can be overcome by increasing the size of the absorption field. This soil is suitable as a site for dwellings with and without basements and for area sanitary landfills. Low strength limits the soil as a site for local roads and streets.

The capability subclass is IIe.

19B3—Georgeville clay loam, 2 to 7 percent slopes, severely eroded. This soil is gently sloping, very deep, and well drained. It is on ridgetops in the western part of the county. Shallow and deep gullies are in some areas. The areas of this unit range from about 5 to 45 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, brown clay loam
Subsoil:
4 to 12 inches, yellowish red silty clay loam
12 to 25 inches, red clay
25 to 36 inches, red clay with brownish yellow mottles
36 to 45 inches, red silty clay with brownish yellow mottles
Substratum:
45 to 60 inches, mottled brownish yellow, red, white, and weak red loam

Included with this unit in mapping are small areas of shallow Goldston soils on ridgetops and somewhat poorly drained Iredell soils on the lower areas. Soils with a surface layer of sandy loam or clay loam or a sandy subsoil and areas with stones and boulders on the surface are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, such as small grains, soybeans, and corn, are moderately well suited to this soil. The permeability, organic matter content, and available water capacity are the main limitations. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. The clay in the surface layer is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Clay in the surface layer limits the use of equipment for managing timber and limits seedling survival.

The permeability limits this soil as a site for septic tank absorption fields, but this can be overcome by increasing the size of the absorption field. This soil is suitable as a site for dwellings with and without basements and for area sanitary landfills. Low strength limits the soil as a site for local roads and streets.

The capability subclass is IIIe.

19C3—Georgeville clay loam, 7 to 15 percent slopes, severely eroded. This soil is strongly sloping, very deep, and well drained. It is on side slopes. Shallow and deep gullies are in some areas. The areas of this soil range from about 5 to 45 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, brown clay loam
Subsoil:
4 to 12 inches, yellowish red silty clay loam
12 to 25 inches, red clay
25 to 36 inches, red clay with brownish yellow mottles
36 to 45 inches, red silty clay with brownish yellow mottles

Substratum:
45 to 60 inches, mottled brownish yellow, red, white, and weak red loam

Included with this soil in mapping are small areas of shallow Goldston soils on side slopes and somewhat poorly drained Iredell soils on the lower areas. Soils with a surface layer of sandy loam and a sandy subsoil and areas with steeper slopes or stones and boulders are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, such as small grains, soybeans, and corn, are moderately well suited to this soil. The permeability, organic matter content, and available water capacity are the main limitations. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. The clay in the surface layer is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Clay in the surface layer limits the use of equipment for managing timber and limits seedling survival.

Slope and the permeability limit this soil as a site for septic tank absorption fields, but the permeability can be overcome by increasing the size of the absorption field. Slope limits the soil as a site for dwellings with and without basements, and it and low strength limit the soil as a site for local roads and streets.

The capability subclass is IVe.

20B—Helena gravelly coarse sandy loam, 2 to 7 percent slopes. This soil is gently sloping, deep, and moderately well drained. It is on toe slopes, in saddles, and along drainageways in the western part of the county. The areas range from about 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches, dark brown gravelly coarse sandy loam
Subsoil:
6 to 18 inches, yellowish brown clay
18 to 30 inches, yellowish brown clay with light gray and red mottles
Substratum:
30 to 50 inches, mottled light gray, brownish yellow, and red clay loam
50 to 60 inches, weathered saprolite that crushes to light gray clay loam with brownish yellow mottles

Included with this soil in mapping are small areas of well drained Appling soils and coarser textured Louisburg soils on the higher areas and poorly drained Roanoke soils on the lower areas. Soils with a surface layer of clay loam or a cobbly surface layer and areas with rock outcrops are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: 48 to 60 inches.
Depth to the water table: 18 to 30 inches.
Root zone: More than 12 inches.
Shrink-swell potential: High.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to this soil. The clay in

the subsoil limits the root zone. Crops on this soil respond well to lime and fertilizer, especially to applications of complete fertilizers and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes will help reduce runoff and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. Restricted root growth and wetness are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Wetness limits use of equipment for managing timber.

Wetness and permeability limit this soil as a site for septic tank absorption fields. Wetness and the shrink-swell potential are limitations for dwellings with basements, and the shrink-swell limits the soil as a site for dwellings without basements. Low strength and the shrink-swell are limitations for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIe.

21B—Iredell loam, 2 to 7 percent slopes. This soil is gently sloping, deep and very deep, and somewhat poorly drained. It is on toe slopes, in saddles, and along drainageways in the western part of the county. The areas range from about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches, grayish brown loam
Subsurface layer:
3 to 7 inches, light gray loam with strong brown mottles
Subsoil:
7 to 26 inches, yellowish brown clay with yellow mottles
26 to 31 inches, yellowish brown clay with light gray and yellow mottles
Substratum:
31 to 60 inches, strong brown saprolite that has a silty clay loam texture and manganese stains

Included with this soil in mapping are small areas of well drained Fluvanna soils and shallow Goldston soils on the higher areas and poorly drained Roanoke soils on the lower areas. Soils with a surface layer of clay loam or clay and areas with stones and rock outcrops are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Slow.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: High.
Soil reaction: Very strongly acid to mildly alkaline.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Fair.
Depth to bedrock: More than 60 inches.
Depth to the water table: 12 to 24 inches.
Root zone: More than 40 inches.
Shrink-swell potential: Very high.

Cultivated crops are poorly suited to this soil. The soil dries slowly after extended wet periods, and denitrification may occur. Split applications of nitrogen and starter applications of a complete fertilizer are needed for most crops. The high clay content in the subsoil impedes root development, and the soil is droughty. Clods form if the soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes help to improve tilth, reduce runoff, and control erosion. Small grains tend to lodge on this soil.

Pasture grasses and legumes are moderately well suited to this soil. Restricted root growth, wetness, and low available water capacity are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

This soil is used mainly for woodland. The potential productivity for loblolly pine is high. The estimated annual production of wood per acre is 90 cubic feet. Wetness and the clayey subsoil limit the use of equipment for managing timber, and the clay limits seedling survival.

Wetness and permeability limit this soil as a site for septic tank absorption fields. Wetness and the shrink-swell potential are limitations for dwellings with and without basements. Low strength and the shrink-swell are limitations for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIIe.

22C3—Iredell clay loam, 7 to 15 percent slopes, severely eroded. This soil is strongly sloping, deep and very deep, and somewhat poorly drained. It is on side slopes in the western part of the county. Shallow and deep gullies are in some areas. The areas of this soil range from about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, grayish brown clay loam
Subsoil:
4 to 26 inches, yellowish brown clay with yellow mottles
26 to 31 inches, yellowish brown clay with light gray and yellow mottles
Substratum:
31 to 60 inches, strong brown saprolite that has a silty clay loam texture and manganese stains

Included with this soil in mapping are small areas of well drained Fluvanna soils and shallow Goldston soils on the higher areas and poorly drained Roanoke soils on the lower areas. Soils with a surface layer of silty clay loam or clay, steeper soils, and soils with stones or rock outcrops on the surface are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Slow.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: High.
Soil reaction: Very strongly acid to mildly alkaline.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: 12 to 24 inches.
Root zone: More than 40 inches.
Shrink-swell potential: Very high.

Cultivated crops generally are unsuited to this soil. It has a clayey surface layer and numerous shallow gullies. If exposed, the subsoil is subject to cracking, and it impedes root development. Nitrogen is needed in the soil for establishment of small grains and grass-clover mixtures.

Pasture grasses and legumes are poorly suited to this soil. The clay in the surface layer, the low available water capacity, and the restricted root growth are limitations. If this soil is pastured, the main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

This soil is used mainly for woodland. The potential productivity for loblolly pine is high. The estimated annual production of wood per acre is 90 cubic feet. Wetness and the clayey subsoil limit the use of equipment for managing timber, and the clay limits seedling survival.

Slope, wetness, and permeability limit this soil as a site for septic tank absorption fields. Slope, wetness, and the shrink-swell potential limit the soil as a site for dwellings with and without basements and for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is VIe.

23D—Louisburg-Rock outcrop complex, 2 to 25 percent slopes. This unit consists of gently sloping to moderately steep, deep and very deep, well drained soils and rock outcrops of granite roughly 30 to 300 feet apart (fig. 3). It is on ridgetops and side slopes in the southwest part of the county. The areas range from about 5 to 25 acres. They are about 50 percent Louisburg soils, 30 percent rock outcrops, and 20 percent included soils. The Louisburg soils and rock outcrops are so intermingled that it was not practical to map them separately.

The typical sequence, depth, and composition of the layers of the Louisburg soil are as follows—

Surface layer:
0 to 5 inches, dark grayish brown gravelly coarse sandy loam
Subsurface layer:
5 to 11 inches, yellowish brown gravelly coarse sandy loam
Subsoil:
11 to 24 inches, brownish yellow gravelly coarse sandy loam and lenses and irregularly shaped bodies of yellowish brown gravelly sandy clay loam
Substratum:
24 to 60 inches, brownish yellow and strong brown gravelly coarse sandy loam

Included with this unit in mapping are small areas of finer textured Appling and Mattaponi soils on ridgetops and side slopes and moderately well drained Helena soils on the lower areas. Soils with a surface layer of

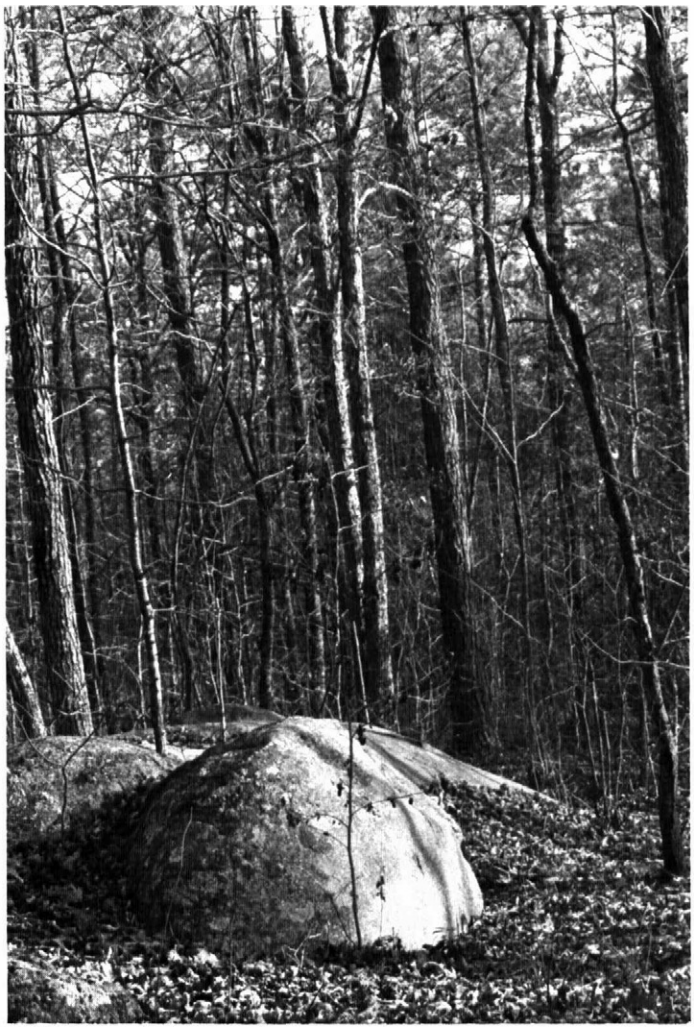

Figure 3.—An area of Louisburg-Rock outcrop complex, 2 to 25 percent slopes.

loam or clay loam and soils that are shallower to bedrock are in some units.

Major properties of the Louisburg soil—

Permeability: Rapid.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Medium to very rapid.
Erosion hazard: Moderate to very severe.
Tilth: Good.
Depth to bedrock: More than 40 inches.
Depth to the water table: More than 72 inches.
Root zone: More than 40 inches.
Shrink-swell potential: Very low.

Cultivated crops are generally unsuited to this unit. The rock outcrops and droughtiness are the major limitations.

Pasture grasses and legumes are poorly suited to this unit. The available water capacity, slope, and rock outcrops are the main limitations. If this unit is pastured, the main management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

This unit is used mainly for woodland. The potential productivity for loblolly pine on the Louisburg soil is high. The estimated annual production of wood per acre is 80 cubic feet. The rock outcrops limit the use of equipment for managing timber.

Slope and the rock outcrops limit this unit as a site for septic tank absorption fields, dwellings with and without basements, and local roads and streets.

The capability subclass is VIIs.

24B—Mattaponi sandy loam, 2 to 6 percent slopes. This soil is gently sloping, very deep, and moderately well drained. It is on knolls and ridgetops at an elevation of more than 100 feet. The areas range from about 5 to 200 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, dark grayish brown sandy loam
Subsurface layer:
4 to 15 inches, light yellowish brown sandy loam
Subsoil:
15 to 28 inches, yellowish brown clay loam
28 to 41 inches, yellowish brown clay
41 to 51 inches, yellowish brown clay with red mottles
51 to 60 inches, mottled red, yellowish brown, and light gray sandy clay
Substratum:
60 to 69 inches, mottled red, brownish yellow, and light gray sandy clay loam

Included with this soil in mapping are small areas of well drained Appling and Uchee soils on knolls and ridgetops and poorly drained Woodington soils on the lower areas. Soils with a surface layer of sandy clay loam and a redder subsoil are in some units. Included

soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 36 to 72 inches.
Root zone: More than 48 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to this soil. The clay in the subsoil limits the root zone. Crops on this soil respond well to lime and fertilizer, especially to starter applications of complete fertilizers and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes will help reduce runoff and control erosion.

Pasture grasses and legumes are well suited to this soil. Restricted root growth is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on this soil.

Wetness and the permeability limit the soil as a site for septic tank absorption fields, and wetness and the shrink-swell potential are limitations for dwellings with basements. The shrink-swell potential also limits this soil as a site for dwellings without basements. Low strength limits this soil as a site for local roads and streets. This soil is suited to area-type sanitary landfills.

The capability subclass is IIe.

25B—Mattaponi gravelly sandy loam, 2 to 6 percent slopes. This soil is gently sloping, very deep, and moderately well drained. It is on knolls and ridgetops at an elevation of more than 100 feet. The areas range from about 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 5 inches, brown gravelly sandy loam
Subsoil:
5 to 28 inches, yellowish brown gravelly sandy clay loam
28 to 42 inches, yellowish brown gravelly clay with red and light gray mottles
Substratum:
42 to 60 inches, mottled yellowish brown, red, and light gray sandy clay loam

Included with this soil in mapping are small areas of well drained Appling and Uchee soils. Also included are soils with a redder subsoil or a surface layer of sandy clay loam or a cobbly surface layer. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low to moderate.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Medium.
Erosion hazard: Moderate.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 36 to 72 inches.
Root zone: More than 48 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to this soil. The clay in the subsoil limits the root zone. Crops on this soil respond well to lime and fertilizer, especially to applications of complete fertilizers and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes will help reduce runoff and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. The gravel in the surface layer and the restricted root growth are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil

is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on this soil.

Wetness and the permeability limit the soil as a site for septic tank absorption fields, and wetness and the shrink-swell potential are limitations for dwellings with basements. The shrink-swell potential also limits this soil as a site for dwellings without basements. Low strength limits this soil as a site for local roads and streets. This soil is suited to area-type sanitary landfills.

The capability subclass is IIe.

25C—Mattaponi gravelly sandy loam, 6 to 15 percent slopes. This soil is strongly sloping, very deep, and moderately well drained. It is on side slopes at an elevation of more than 100 feet. Shallow and deep gullies are in some units. The areas range from about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 5 inches, brown gravelly sandy loam
Subsoil:
5 to 28 inches, yellowish brown gravelly sandy clay loam
28 to 42 inches, yellowish brown gravelly clay with red and light gray mottles
Substratum:
42 to 60 inches, mottled yellowish brown, red, and light gray sandy clay loam

Included with this soil in mapping are small areas of well drained Appling and Uchee soils. Also included are soils with a redder subsoil or a surface layer of sandy clay loam or a cobbly surface layer. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow.
Available water capacity: Moderate.
Organic matter content: Low to moderate.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Water table: 36 to 72 inches.
Root zone: More than 48 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially soybeans, tobacco, small grains, and corn, are well suited to this soil. The clay in the subsoil limits the root zone. Crops on this soil respond well to lime and fertilizer, especially to applications of complete fertilizers and side dressings of nitrogen for crops that require nitrogen. Conservation tillage and a conservation cropping system that includes grasses and legumes will help reduce runoff and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. The gravel in the surface layer and the restricted root growth are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Timber is easily managed on this soil.

Wetness, slope, and permeability limit this soil as a site for septic tank absorption fields. Wetness, slope, and the shrink-swell potential are limitations for dwellings with basements. The shrink-swell potential and slope limit this soil as a site for dwellings without basements, and low strength and slope limit it for local roads and streets.

The capability subclass is IIIe.

26A—Orangeburg loamy sand, 0 to 2 percent slopes. This soil is nearly level, very deep, and well drained. It is on broad upland flats at an elevation of more than 170 feet. The areas range from about 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 10 inches, brown loamy sand
Subsurface layer:
10 to 16 inches, yellowish brown fine sandy loam
Subsoil:
16 to 37 inches, yellowish red sandy clay loam
37 to 57 inches, red sandy clay loam
57 to 71 inches, red sandy clay

Included with this soil in mapping are small areas of Dothan and Uchee soils on upland flats and moderately well drained Mattaponi soils on the steeper areas.

Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Slow.
Erosion hazard: Slight by water; moderate by wind.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 72 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially peanuts, corn, tobacco, and soybeans, are well suited to this soil. This soil is droughty during extended dry periods. Crop production is limited by restricted root growth. Crops on this soil respond well to lime and fertilizer, especially to starter applications of complete fertilizers and split applications of nitrogen, but fertilizer and lime and seasonal moisture changes produce fluctuations in the content of available plant nutrients in the surface layer. Cover crops reduce wind erosion and increase the organic matter content.

Pasture grasses and legumes are well suited to this soil. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 110 cubic feet. Sand in the surface layer limits seedling survival.

This soil is suited as a site for septic tank absorption fields, dwellings with and without basements, local roads and streets, and area and trench-type sanitary landfills.

The capability class is I.

27A—Peawick loam, 0 to 3 percent slopes. This soil is nearly level, very deep, and moderately well drained. It is on stream terraces primarily in the Low Ground section of the county. The areas range from about 5 to 500 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, yellowish brown loam
Subsoil:
4 to 10 inches, strong brown clay with red mottles
10 to 17 inches, yellowish brown clay with red mottles
17 to 33 inches, yellowish brown clay with light gray and yellowish red mottles
33 to 48 inches, light gray and yellowish brown clay
48 to 65 inches, yellowish brown clay with light gray mottles

Included with this soil in mapping are well drained State soils on small higher areas and poorly drained Roanoke soils on small lower areas. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Very slow.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Extremely acid to strongly acid.
Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Fair.
Depth to bedrock: More than 60 inches.
Depth to the water table: 18 to 36 inches.
Root zone: More than 20 inches.
Shrink-swell potential: Very high.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, mainly small grains, soybeans, and corn, are moderately well suited to this soil. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help to improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. Restricted root growth, low available water capacity, and a thin surface layer are the main limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 105 cubic feet. Wetness and the clayey layers

limit the use of equipment for managing timber and limit seedling survival.

The permeability and wetness limit this soil as a site for septic tank absorption fields. The shrink-swell potential limits this soil as a site for dwellings without basements and, along with wetness, limits the soil as a site for dwellings with basements. Low strength and the shrink-swell are limitations for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIw.

28B3—Peawick clay loam, 2 to 6 percent slopes, severely eroded. This soil is gently sloping, very deep, and moderately well drained. It is on stream terraces primarily in the Low Ground section of the county. Shallow and deep gullies are in some units. The areas of this soil range from about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches, yellowish brown clay loam
Subsoil:
3 to 12 inches, yellowish brown clay
12 to 65 inches, yellowish brown clay with red and gray mottles

Included with this soil in mapping are well drained State soils on small higher areas and poorly drained Roanoke soils on small lower areas. Soils with a gravelly surface layer or a surface layer of sandy loam are in some units. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Very slow.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Extremely acid to strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Depth to the water table: 18 to 36 inches.
Root zone: More than 20 inches.
Shrink-swell potential: Very high.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, mainly small grains, soybeans, and corn, are moderately well suited to this soil. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help to improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. Restricted root growth, clay in the surface layer, and low available water capacity are the main limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 105 cubic feet. Wetness and clay in the surface layer limit the use of equipment for managing timber and limit seedling survival.

The permeability and wetness limit this soil as a site for septic tank absorption fields. The shrink-swell potential limits this soil as a site for dwellings without basements and, along with wetness, limits the soil as a site for dwellings with basements. Low strength and the shrink-swell potential are limitations for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIIe.

28C3—Peawick clay loam, 6 to 12 percent slopes, severely eroded. This soil is strongly sloping, very deep, and moderately well drained. It is on stream terraces primarily in the Low Ground section of the county. Shallow and deep gullies are in some units. The areas of this soil range from about 5 to 65 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches, yellowish brown clay loam
Subsoil:
3 to 12 inches, yellowish brown clay
12 to 65 inches, yellowish brown clay with red and gray mottles

Included with this soil in mapping are well drained State soils on small higher areas, poorly drained Roanoke soils on small lower areas, soils with a gravelly surface layer or a surface layer of sandy loam, and steeper soils. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Very slow.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Extremely acid through strongly acid.
Surface runoff: Rapid.
Erosion hazard: Severe.
Tilth: Poor.
Depth to bedrock: More than 60 inches.
Water table: 18 to 36 inches.
Root zone: More than 20 inches.
Shrink-swell potential: Very high.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, mainly small grains, soybeans, and corn, are moderately well suited to this soil. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer. Clods form if this soil is worked at a high moisture content. Conservation tillage and a conservation cropping system that includes grasses and legumes will help to improve tilth, reduce runoff, and control erosion.

Pasture grasses and legumes are moderately well suited to this soil. Restricted root growth, clay in the surface layer, and low available water capacity are the main limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 105 cubic feet. Wetness and clay in the surface layer limit the use of equipment for managing timber and limit seedling survival.

The permeability, slope, and wetness limit this soil as a site for septic tank absorption fields. The shrink-swell potential and slope limit the soil as a site for dwellings without basements, and wetness and slope limit it as a site for dwellings with basements. Low strength and slope are limitations for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IVe.

29—Pits, quarry. This unit is Trego Quarry, a 160-acre open excavation, from which granite is mined (fig. 4). The soil material has been removed during excavation, and there is little or no vegetation. The unit is generally unsuitable for farming, woodland, and urban uses.

The capability subclass is undetermined.

30A—Riverview silt loam, 0 to 2 percent slopes, frequently flooded. This soil is nearly level, very deep, and well drained. It is on flood plains primarily along the Meherrin and Nottoway Rivers and Fountain Creek. The areas range from about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches, brown silt loam
Subsoil:
6 to 21 inches, dark yellowish brown silty clay loam
21 to 38 inches, dark yellowish brown loam
Substratum:
38 to 56 inches, very pale brown sand with yellowish brown and black mottles
56 to 69 inches, dark yellowish brown fine sandy loam with light olive gray mottles
69 to 81 inches, mottled very pale brown, yellow, and black fine sand

Included with this soil in mapping are poorly drained Roanoke soils on small lower areas and coarser textured Tarboro soils on flood plains. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low to moderate.
Natural fertility: Low to medium.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Fair.
Depth to bedrock: More than 60 inches.
Depth to the water table: 36 to 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops, especially peanuts, corn, and soybeans, are moderately well suited to this soil. Frequent flooding and weed competition are the main limitations. Crops on this soil respond to lime and fertilizer, especially to split applications of nitrogen and starter applications of complete fertilizers.

Figure 4.—An area of Pits, quarry.

Pasture grasses and legumes are well suited to this soil. Flooding and weed competition are the main limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 155 cubic feet. Flooding limits use of equipment for managing timber and limits seedling survival.

Flooding and wetness limit this soil as a site for septic tank absorption fields, dwellings with and without basements, and local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IVw.

31A—Roanoke loam, 0 to 2 percent slopes, frequently flooded. This soil is nearly level, very deep, and poorly drained. It is on flood plains in meander scrolls primarily along the Meherrin and Nottoway Rivers and Fountain and Three Creeks. The areas range from about 10 to 500 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 5 inches, grayish brown loam with light olive brown mottles
Subsoil:
5 to 16 inches, light brownish gray clay loam with light yellowish brown and yellowish red mottles
16 to 26 inches, light olive gray clay loam with yellowish red and yellowish brown mottles
26 to 43 inches, light gray clay with yellowish red and brownish yellow mottles
Substratum:
43 to 74 inches, mottled light gray, gray, and yellowish brown clay

Included with this soil in mapping are small higher areas of moderately well drained Altavista soils and well drained State and Appling soils. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Slow.
Available water capacity: Moderate.
Organic matter content: Low to high.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Fair.
Depth to bedrock: More than 60 inches.
Depth to the water table: 0 to 12 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops are poorly suited to this soil. Crop production is limited by flooding and wetness. If crops are grown, they respond to lime and fertilizer.

Pasture grasses and legumes are moderately well suited to this soil. Wetness, flooding, and weed competition are the main limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 120 cubic feet. Wetness and flooding limit the use of equipment for managing timber and limit seedling survival.

Flooding, wetness, and permeability limit this soil as a site for septic tank absorption fields. Flooding and wetness are limitations for dwellings with and without basements and, along with low strength, are limitations for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is Vw.

32A—Roanoke silt loam, 0 to 2 percent slopes, ponded. This soil is nearly level, very deep, and very poorly drained. It is on flood plains primarily along the Meherrin River and Fountain Creek. Up to 3 feet of water is on this soil for about 3 to 11 months each year. The areas of the soil range from about 5 to 500 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 16 inches, grayish brown silt loam
Subsoil:
16 to 26 inches, grayish brown silty clay loam with yellowish red and yellowish brown mottles
26 to 53 inches, gray silty clay with yellowish red and yellowish brown mottles
Substratum:
53 to 77 inches, gray and yellowish brown silty clay loam

Included with this soil in mapping are small higher areas of moderately well drained Altavista soils and somewhat poorly drained Chenneby soils. They make up about 20 percent of this unit.

Major soil properties—

Permeability: Slow.
Available water capacity: Moderate.
Organic matter content: Low to high.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Ponded.
Erosion hazard: Slight.
Tilth: Fair.
Depth to bedrock: More than 60 inches.
Water table: 36 inches above the surface to a depth of 12 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Moderate.

Flooding and wetness make this soil poorly suited to crops and generally unsuitable for pasture grasses and legumes and community development.

This soil is used mainly for woodland. The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 125 cubic feet. Wetness and flooding limit use of equipment for managing timber and limit seedling survival.

The capability subclass is VIIw.

33A—Slagle fine sandy loam, 0 to 3 percent slopes. This soil is nearly level, very deep, and moderately well drained. It is on toe slopes, in saddles, and along drainageways at an elevation of more than 100 feet. The areas range from about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 9 inches, pale brown fine sandy loam
Subsoil:
9 to 14 inches, yellowish brown loam with very pale brown mottles
14 to 20 inches, yellowish brown clay loam
20 to 30 inches, yellowish brown clay loam with light gray and yellowish red mottles
30 to 55 inches, mottled yellowish brown, light gray, and light yellowish brown sandy clay loam
Substratum:
55 to 66 inches, mottled yellowish brown and light gray sandy clay loam

Included with this soil in mapping are small areas of finer textured Mattaponi soils and well drained Uchee soils on the higher areas, poorly drained Woodington soils on the lower areas, and soils with dense, compact layers in the subsoil. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow or slow.
Available water capacity: Moderate.
Organic matter content: Low to moderate.
Natural fertility: Low.
Soil reaction: Extremely acid to strongly acid.
Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 18 to 36 inches.
Root zone: More than 30 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially soybeans and corn, are well suited to this soil. Crops respond to lime and fertilizer, especially to a starter application of a complete fertilizer, and split applications of nitrogen are needed for crops requiring nitrogen. When wet, this soil adheres to peanuts at harvesting, resulting in broken pegs, reduced yields, and lower grades. Small grains tend to lodge on this soil.

Pasture grasses and legumes are well suited to this soil. Restricted root growth and wetness are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 125 cubic feet. Wetness limits use of equipment for managing timber.

The permeability, slope, and wetness limit this soil as a site for septic tank absorption fields. The shrink-swell potential and slope limit the soil as a site for dwellings without basements, and wetness and slope limit it as a site for dwellings with basements. Low strength and slope are limitations for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIw.

34A—State loamy sand, 0 to 3 percent slopes. This soil is nearly level, very deep, and well drained. It is on stream terraces primarily in the Low Ground section of the county. The areas range from about 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 11 inches, grayish brown loamy sand
Subsurface layer:
11 to 20 inches, light yellowish brown sandy loam
Subsoil:
20 to 28 inches, yellowish brown sandy clay loam with light yellowish brown mottles
28 to 48 inches, yellowish brown sandy clay loam with yellowish red mottles
Substratum:
48 to 63 inches, yellowish brown sandy loam with yellowish red mottles

Included with this soil in mapping are small areas of moderately well drained Altavista soils on stream terraces and poorly drained Roanoke soils on the lower areas. They make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Slow.
Erosion hazard: Slight by water; moderate by wind.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 48 to 72 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops (fig. 5). Some areas are in woodland.

Cultivated crops, especially peanuts, corn, tobacco, and soybeans, are well suited to this soil. This soil is droughty during extended dry periods. Crop production is limited by restricted root growth. Crops on this soil respond well to lime and fertilizer, especially to starter applications of complete fertilizers and split applications of nitrogen, but fertilizer and lime and seasonal moisture changes produce fluctuations in available plant nutrients in the surface layer. Cover crops reduce wind erosion and increase the organic matter content.

Pasture grasses and legumes are well suited to this soil. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 140 cubic feet. Sand in the surface layer limits seedling survival.

Wetness limits this soil as a site for septic tank absorption fields and dwellings with basements. Low strength is a limitation for local roads and streets. This soil is suitable as a site for dwellings without basements.

The capability class is I.

35A—Tarboro loamy sand, 0 to 2 percent slopes, frequently flooded. This soil is nearly level, very deep, and somewhat excessively drained. It is on flood plains primarily along the Meherrin River and Fountain Creek. The areas range from about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 12 inches, dark brown loamy sand
Subsoil:
12 to 32 inches, yellowish brown loamy sand
Substratum:
32 to 72 inches, brownish yellow sand

Included with this soil in mapping are small areas of moderately well drained Altavista soils and well drained Wickham soils on the lower areas and finer textured Riverview soils on similar flood plains. They make up about 20 percent of this unit.

Major soil properties—

Permeability: Rapid.
Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Strongly acid to slightly acid.
Surface runoff: Slow.
Erosion hazard: Slight by water; moderate by wind.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially peanuts, corn, and soybeans, are well suited to this soil. Frequent flooding causes crop losses in some years, and crop production is limited by weed competition. Crops on this soil respond well to lime and fertilizer, especially to starter applications of complete fertilizers and split applications of nitrogen.

Pasture grasses and legumes are poorly suited to this soil. Flooding, weed competition, and low available water capacity are the main limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 95 cubic feet. Flooding and sand in the surface layer limit the use of equipment for managing timber and limit seedling survival.

Flooding and the rapid permeability limit this soil as a site for septic tank absorption fields. Flooding also limits this soil as a site for dwellings with and without basements and for local roads and streets. Groundwater pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

Figure 5.—Harvesting corn on State loamy sand, 0 to 3 percent slopes.

The capability subclass is IIIs.

36B—Uchee loamy sand, 0 to 6 percent slopes. This soil is nearly level and gently sloping, very deep, and well drained. It is on broad upland flats and ridgetops at an elevation of more than 100 feet. The areas range from about 5 to 150 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, grayish brown loamy sand
Subsurface layer:
8 to 25 inches, light yellowish brown loamy sand
25 to 34 inches, light yellowish brown loamy sand with pockets of yellowish brown sandy loam
Subsoil:
34 to 52 inches, strong brown sandy clay loam
Substratum:
52 to 66 inches, strong brown sandy clay loam with light gray mottles

Included with this soil in mapping are small areas of moderately well drained Craven and Slagle soils on the lower areas, well drained Emporia soils on upland flats, and soils with plinthitic layers and a redder subsoil. Included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately slow.

Available water capacity: Low.
Organic matter content: Low.
Natural fertility: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Slow to medium.
Erosion hazard: Slight to moderate by water; moderate by wind.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 42 to 60 inches.
Root zone: More than 45 inches.
Shrink-swell potential: Moderate.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops such as corn, soybeans, and tobacco are moderately well suited to this soil, and peanuts are well suited. Crops on this soil respond well to starter applications of complete fertilizers, to split applications of nitrogen, and to lime. Conservation tillage practices and a conservation cropping system that includes grasses and legumes help to reduce runoff and control erosion.

Pasture grasses and legumes are poorly suited to this soil. The sand in the surface layer, the low available water capacity, and restricted root growth are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 115 cubic feet. The sand in the surface layer limits the use of equipment for managing timber and limits seedling survival.

Wetness and the permeability limit this soil as a site for septic tank absorption fields. Wetness and the shrink-swell potential are limitations for dwellings with basements. This soil is suitable as a site for dwellings without basements and for local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIs.

37—Udorthents, loamy. This unit consists of nearly level to moderately steep soils that are shallow to very deep and somewhat poorly drained to well drained. They are on uplands, stream terraces, and flood plains throughout the county. The areas range from about 5 to 300 acres. They are borrow pits and construction sites for houses, buildings, and highways. The thickness of the fill is variable but is generally more than 20 inches. It is mainly soil material that ranges from sand to clay. The soils covered by fill range from poorly drained to somewhat excessively drained.

Included with this soil in mapping are small areas of Iredell, Louisburg, Mattaponi, Roanoke, and Tarboro soils and rock outcrops. They make up about 20 percent of this unit.

Major soil properties—

Permeability: Very slow to moderately rapid.
Available water capacity: Low to high.
Organic matter content: Low to high.
Natural fertility: Low to high.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Very slow to rapid.
Erosion hazard: Slight to severe.
Tilth: Poor to good.
Depth to bedrock: At least 10 inches.
Depth to the water table: At least 10 inches.
Root zone: 10 inches or more.
Shrink-swell potential: Low to high.

Onsite investigation is needed to determine the suitability of this unit for any use.

The capability subclass is undetermined.

38A—Wickham fine sandy loam, 0 to 3 percent slopes. This soil is nearly level, very deep, and well drained. It is on stream terraces primarily in the Low Ground section of the county. The areas range from about 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, pale brown fine sandy loam
Subsoil:
8 to 22 inches, yellowish red fine sandy loam
22 to 37 inches, red clay loam
37 to 48 inches, red clay
48 to 57 inches, red clay loam
57 to 76 inches, red sandy clay

Included with this soil in mapping are small areas of moderately well drained Altavista soils on stream terraces, poorly drained Roanoke soils on the lower areas, and soils with a surface layer of clay loam. The included soils make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderate.
Available water capacity: Moderate.

Organic matter content: Low to moderate.
Natural fertility: Low.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops (fig. 6). Some areas are in woodland.

Cultivated crops, especially soybeans and corn, are well suited to this soil. Crops on this soil respond well to lime and fertilizer, especially to a complete fertilizer and split applications of nitrogen for crops requiring nitrogen.

Pasture grasses and legumes are well suited to this soil. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 130 cubic feet. Timber is easily managed on this soil.

This soil is suitable as a site for septic tank absorption fields, dwellings with and without basements, local roads and streets, and area-type sanitary landfills.

The capability class is I.

39A—Wickham sandy loam, 0 to 2 percent slopes, frequently flooded. This soil is nearly level, very deep, and well drained. It is on flood-plain point bars primarily along the Meherrin and Nottoway Rivers and Fountain Creek. The areas range from about 5 to 65 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches, dark yellowish brown sandy loam
Subsoil:
6 to 30 inches, reddish brown and yellowish red sandy clay loam
30 to 55 inches, yellowish red sandy loam with strong brown mottles
Substratum:
55 to 70 inches, strong brown and reddish yellow gravelly coarse sand

Included with this soil in mapping are small areas of moderately well drained Altavista soils on point bars, somewhat poorly drained Chenneby soils on the lower areas, coarser textured Tarboro soils on the higher areas, and soils with a surface layer of sandy clay loam. They make up about 20 percent of this unit.

Major soil properties—
Permeability: Moderate.
Available water capacity: Moderate.
Organic matter content: Low to moderate.
Natural fertility: Low.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: More than 60 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for cultivated crops. Some areas are in woodland.

Cultivated crops, especially soybeans and corn, are well suited to this soil. Crop production is limited by flooding during the growing season and by weed competition. Crops on this soil respond well to lime and fertilizer, especially to a starter application of a complete fertilizer.

Pasture grasses and legumes are well suited to this soil. Flooding and weed competition are limitations. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is very high. The estimated annual production of wood per acre is 130 cubic feet. Flooding limits the use of equipment for managing timber and limits seedling survival.

Flooding limits this soil as a site for septic tank absorption fields, dwellings with and without basements, and local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIw.

40A—Woodington fine sandy loam, 0 to 2 percent slopes. This soil is nearly level, very deep, and poorly drained. It is in broad depressions and along drainageways at an elevation of more than 100 feet. The areas range from about 5 to 100 acres.

The typical sequence, depth, and composition of the

Figure 6.—Planting peanuts on Wickham fine sandy loam, 0 to 3 percent slopes.

layers of this soil are as follows—

Surface layer:
0 to 7 inches, very dark grayish brown fine sandy loam

Subsurface layer:
7 to 17 inches, dark gray fine sandy loam with gray mottles

Subsoil:
17 to 29 inches, olive gray sandy loam with yellowish brown mottles
29 to 43 inches, gray fine sandy loam with yellowish brown mottles
43 to 76 inches, gray sandy loam with strong brown and light yellowish brown mottles

Included with this soil in mapping are small areas of moderately well drained Craven soils on the steeper areas; moderately well drained Slagle soils in broad depressions and along drainageways; soils with a fragipan in the subsoil; soils with a surface layer and subsoil of loamy sand or sand; and soils with a brittle, dark brown and black subsoil. They make up about 20 percent of this unit.

Major soil properties—

Permeability: Moderately rapid.
Available water capacity: Moderate.
Organic matter content: Moderate.
Natural fertility: Low.
Soil reaction: Extremely acid to strongly acid.

Surface runoff: Slow.
Erosion hazard: Slight.
Tilth: Good.
Depth to bedrock: More than 60 inches.
Depth to the water table: 6 to 12 inches.
Root zone: More than 60 inches.
Shrink-swell potential: Low.

This soil is used mainly for woodland. Some areas are in cultivated crops.

Cultivated crops are poorly suited to this soil. Crop production is limited by flooding and wetness. If crops are grown, they respond to lime and fertilizer.

Pasture grasses and legumes are moderately well suited to this soil. Wetness is a limitation. The main pasture management practices are maintaining a mixture of grasses and legumes, rotation and deferred grazing, controlling weeds, using proper stocking rates, and applying lime and fertilizer.

The potential productivity for loblolly pine on this soil is high. The estimated annual production of wood per acre is 100 cubic feet. Wetness limits use of equipment for managing timber and limits seedling survival.

Wetness limits this soil as a site for septic tank absorption fields, dwellings with and without basements, and local roads and streets. Ground-water pollution is a hazard if the soil is used as a site for sewage lagoons and sanitary landfills.

The capability subclass is IIIw.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. Identification of prime farmland is a major step in meeting the Nation's needs for food and fiber.

The U.S. Department of Agriculture defines prime farmland as the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce a sustained high yield of crops while using acceptable farming methods. Prime farmland produces the highest yields and requires minimal amounts of energy and economic resources, and farming it results in the least damage to the environment.

An area identified as prime farmland must be used for producing food or fiber or must be available for those uses. Thus, urban and built-up land and water areas are not classified as prime farmland.

The general criteria for prime farmland are as follows: a generally adequate and dependable supply of moisture from precipitation or irrigation, favorable temperature and growing-season length, acceptable levels of acidity or alkalinity, few or no rocks, and permeability to air and water. Prime farmland is not excessively erodible, is not saturated with water for long periods, and is not flooded during the growing season. The slope range is mainly from 0 to 6 percent. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

The survey area contains about 78,826 acres of prime farmland. That acreage makes up about 41 percent of the total acreage in the survey area and is mainly in the eastern part of the county.

The soil map units that make up prime farmland in the survey area are listed in table 8. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 7, and the location of each unit is shown on the detailed soil maps at the back of this publication. The soil properties and characteristics that affect use and management of the units are described in the section "Detailed Soil Map Units."

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid 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 behavior 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 woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for 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 and gravel, 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.

Crops and Pasture

In this section the system of land capability classification used by the Soil Conservation Service is explained and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 9. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

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 are also 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.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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 table 9 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 Soil 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 woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. The levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

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, IIe. The letter *e* shows that the main limitation is 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 I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

Table 10 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed in the tables. The table gives the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, that the indicator species can produce. The larger the number, the greater the potential productivity. The number 1 indicates low productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 through 8, high; 9 through 11, very high; and 12 or more, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation for use and management. The letter *R*

indicates steep slopes; *X*, stones or rocks on the surface; *W*, excessive water in or on the soil; *T*, excessive alkalinity, acidity, sodium salts, or other toxic substances in the soil; *D*, restricted rooting depth caused by bedrock, hardpan, or other restrictive layer; *C*, clay in the upper part of the soil; *S*, sandy texture; and *F*, high content of rock fragments in the soil profile. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

In table 10, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that erosion can occur as a result of site preparation or following cutting operations and where the soil is exposed, for example, roads, skid trails, fire lanes, and log handling areas. Forests that are abused by fire or overgrazing are also subject to erosion. The ratings for the erosion hazard are based on the percent of the slope and on the erosion factor K shown in table 18. A rating of *slight* indicates that no particular measures to prevent erosion are needed under ordinary conditions. A rating of *moderate* indicates that erosion control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

The proper construction and maintenance of roads, trails, landings, and fire lanes will help overcome the erosion hazard.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that equipment use normally is not restricted either in kind of equipment that can be used or time of year because of soil factors. If soil wetness is a factor, equipment use can be restricted for a period not to exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If soil wetness is a factor, equipment use is restricted for 2 to 6 months. A rating of *severe* indicates that equipment use is severely restricted either in kind of equipment or season of use. If soil wetness is a factor, equipment use is restricted for more than 3 months.

Choosing the most suitable equipment and timing harvesting and other management operations to avoid seasonal limitations help overcome the equipment limitation.

Seedling mortality refers to the probability of death of naturally occurring or planted tree seedlings as influenced by kinds of soil or topographic conditions. The factors considered in rating the soils for seedling mortality are texture of the surface layer, depth and duration of the water table, rock fragments in the surface layer, rooting depth, and aspect of the slope. A rating of *slight* indicates that under usual conditions the expected mortality is less than 25 percent. A rating of *moderate* indicates that the expected mortality is 25 to 50 percent. Extra precautions are advisable. A rating of *severe* indicates that the expected mortality is more than 50 percent. Extra precautions are important. Replanting may be necessary.

The use of special planting stock and special site preparation, such as bedding, furrowing, or surface drainage, can help reduce seedling mortality.

Windthrow hazard is the likelihood of trees being uprooted (tipped over) by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions are a seasonal high water table and bedrock or a fragipan or other limiting layer. A rating of *slight* indicates that normally no trees are blown down by the wind. Strong winds may break trees but do not uproot them. A rating of *moderate* indicates that moderate or strong winds occasionally blow down a few trees during periods of soil wetness. A rating of *severe* indicates that moderate or strong winds may blow down many trees during periods of soil wetness.

The use of specialized equipment that does not damage surficial root systems during partial cutting operations can help reduce windthrow. Care in thinning or no thinning also can help reduce windthrow.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This 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. Common trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class*, a number, represents an expected volume produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced on a fully stocked, even-aged, unmanaged stand. One cubic meter per hectare equals 14.3 cubic feet per acre.

Trees to plant are those that are suited to the soil and are planted for commercial wood production.

Recreation

The soils of the survey area are rated in table 11 according to limitations that affect their suitability for recreation. The ratings 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 sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 11, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 11 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 14 and interpretations for dwellings without basements and for local roads and streets in table 13.

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 best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 12, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for

satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, timothy, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggar-ticks, quackgrass, and ragweed.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, birch, cherry, maple, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are gray dogwood, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, yew, cedar, and hemlock.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, arrowhead, burreed, pickerel weed, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, swamps, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadow vole, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, frogs, and tree swallow.

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. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

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 within a depth of 5 or 6 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 need to 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 grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, 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 kind 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 (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) 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

Table 13 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

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 stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil

properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost-action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 14 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 14 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

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. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 14 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive 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.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin

layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 14 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area-type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 15 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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 soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high 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 engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 15, only the probability 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 or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of

clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

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.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

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

Table 16 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; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, and grassed waterways.

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. 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, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the

soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

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 grain-size distribution, plasticity, and compaction characteristics.

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 characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 17 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

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 as much as about 15 percent, 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 *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-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 grain-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 3 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.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted.

Physical and Chemical Properties

Table 18 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major 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 greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and 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 ⅓ bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major 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 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. A bulk density of more than 1.6 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 refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water 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, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

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 major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. 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.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major 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.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and

type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

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) 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 (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.
5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.
6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.
7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.
8. Stony or gravelly soils and other soils not subject to wind erosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 18, 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 of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 19 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

Some soils in table 19 are assigned to two hydrologic soil groups. Dual grouping is used for one of two reasons: (1) Some soils have a seasonal high water table but can be drained. In this instance the first letter applies to the drained condition of the soil and the

second letter to the undrained condition. (2) In some soils that are less than 20 inches deep to bedrock, the first letter applies to areas where the bedrock is cracked and pervious and the second letter to areas where the bedrock is impervious or where exposed bedrock makes up more than 25 percent of the surface of the soil.

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 high shrink-swell potential, soils that have a permanent 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.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 19 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable period of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding 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 absence of distinctive horizons, which are characteristic of soils that are not subject to flooding.

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.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely, grayish colors or mottles in the soil. Indicated in table 19 are the depth to the seasonal high water table; the kind of water table, that is, *perched, artesian,* or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 19.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the "High water table—Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table

is below a depth of 6 feet or that the water table exists for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves 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 sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel 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 is also 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 *(5)*. 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. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten 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 Entisol.

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 Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

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; 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 Haplaquents (*Hapl*, meaning minimal horizonation, plus *aquent*, the suborder of the Entisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic 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 known kind of soil. 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 Haplaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly 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, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, mesic Typic Haplaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other 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 (4)*. The chemical, physical, and mineralogical properties for each pedon selected as typical of the series and for several pedons within each map unit are in the supplemental data for this soil series *(3)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (5)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Abell Series

The soils of the Abell series are very deep and moderately well drained. They formed in unconsolidated, fluvial sediments and residuum from consolidated metasediments. They are on uplands in the Piedmont physiographic province. Slopes range from 2 to 7 percent.

The Abell soils are near Fluvanna, Goldston, and Roanoke soils. The Abell soils are wetter than the Fluvanna and Goldston soils and better drained than the Roanoke soils.

Typical profile of Abell loam, 2 to 7 percent slopes, about 0.9 mile northeast of the junction of Highway VA-601 and the Brunswick County line and 370 yards west-northwest of Highway VA-601, about 2 miles north of Barley:

Oi—2 inches to 0; partially decomposed leaves and twigs.

A—0 to 1 inch; very dark grayish brown (10YR 3/2) loam; moderate medium and fine granular structure; very friable, slightly sticky, slightly plastic; many fine medium and coarse roots; 1 percent gravel; very strongly acid; abrupt smooth boundary.

E—1 to 9 inches; light yellowish brown (10YR 6/4) loam; weak medium and fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; 2 percent gravel; very strongly acid; clear smooth boundary.

Bt1—9 to 14 inches; yellowish brown (10YR 5/6) loam; common medium distinct light yellowish brown (2.5Y 6/4) mottles; weak medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; many distinct clay films on faces of peds; 1 percent gravel; very strongly acid; gradual smooth boundary.

Bt2—14 to 28 inches; yellowish brown (10YR 5/6) clay loam; many medium distinct light yellowish brown (2.5Y 6/4) and light gray (10YR 7/1) mottles; moderate medium and fine subangular blocky structure; friable, sticky, plastic; common fine and medium roots; many distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.

2Bt3—28 to 40 inches; yellowish brown (10YR 5/6) clay loam; many medium distinct yellowish red (5YR 5/8), light yellowish brown (2.5Y 6/4), and light gray (10YR 7/1) mottles; moderate very thick platy structure parting to moderate medium and fine subangular blocky; friable, sticky, plastic; common fine and medium roots; many distinct clay films on faces of peds; 20 percent highly weathered shale; very strongly acid; diffuse smooth boundary.

2C—40 to 65 inches; mottled brownish yellow (10YR 6/6), light gray (5Y 7/1), and red (2.5YR 4/6) sandy loam; massive; friable, sticky, plastic; few fine and medium roots; 90 percent highly weathered shale; very strongly acid.

The solum thickness ranges from 30 to 60 inches. The depth to the 2Bt horizon ranges from 24 to 48 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges mainly from 0 to 15 percent in the solum, but is 0 to 35 percent in individual horizons. Reaction in unlimed areas is very strongly acid or strongly acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 2 through 6. It is loam, silt loam, or fine sandy loam in the fine earth fraction.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, chroma of 3 through 6. It is loam, silt loam, or fine sandy loam in the fine earth fraction.

The Bt horizon has hue of 7.5YR through 10YR, value of 4 through 6, and chroma of 4 through 8. It is loam, clay loam, or silty clay loam in the fine earth fraction. The lower part of the Bt horizon is mottled red, yellow, and gray.

The 2Bt horizon has hue of 5YR through 2.5Y, value of 4 or 5, and chroma of 4 through 8, or it is mottled without dominant matrix color. It mainly is clay loam, silty clay loam, silty clay, or clay in the fine earth fraction. Gravelly layers are at or near the contact between the Bt and 2Bt horizons in some profiles.

The 2C horizon is mottled brown, yellow, red, olive, and gray. It is sandy loam or loam in the fine earth fraction.

Altavista Series

The soils of the Altavista series are very deep and moderately well drained. They formed in loamy, unconsolidated, fluvial sediments. They are on flood-plain point bars and stream terraces in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 0 to 3 percent.

The Altavista soils are near Bojac, Roanoke, and Wickham soils. The Altavista soils are wetter than the Bojac and Wickham soils and better drained than the Roanoke soils.

Typical profile of Altavista fine sandy loam, 0 to 3 percent slopes, about 700 yards east of the junction of

Highways VA-730 and VA-622 (Bryants Corner), and about 6 miles east of Skippers:

Ap—0 to 7 inches; grayish brown (2.5Y 5/2) fine sandy loam; massive; friable; common fine roots; slightly acid; abrupt smooth boundary.
E—7 to 10 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; massive; firm, slightly sticky, slightly plastic; few fine roots; moderately acid; clear smooth boundary.
Bt1—10 to 17 inches; olive yellow (2.5Y 6/6) clay loam; weak medium subangular blocky structure; friable, sticky, plastic; few fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; very strongly acid; diffuse smooth boundary.
Bt2—17 to 30 inches; yellowish brown (10YR 5/8) clay loam; weak medium subangular blocky structure; friable, sticky, plastic; few fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; strongly acid; diffuse smooth boundary.
Bt3—30 to 50 inches, brownish yellow (10YR 6/8) sandy clay loam; many medium distinct light gray (2.5Y 7/2) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; very strongly acid; clear wavy boundary.
2C—50 to 68 inches; mottled light gray (2.5Y 7/2) and reddish yellow (7.5YR 6/8) clay; massive; firm, sticky, plastic; few fine roots; very strongly acid.

The solum thickness ranges from 30 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 5 percent in the solum and 0 to 50 percent in the C horizon. Reaction in unlimed areas is very strongly acid through moderately acid.

Some pedons have an A horizon with hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 through 3. It is loam or fine sandy loam.

The Ap horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 1 through 4. It is loam or fine sandy loam.

The E horizon has hue of 10YR or 2.5Y, value of 5 through 7, and chroma of 3 through 8. It is loam or fine sandy loam.

The Bt horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 4 through 8. It is loam, clay loam, or sandy clay loam. The lower part of the Bt horizon is mottled brown, yellow, and gray.

The C or 2C horizon is mottled gray, red, brown, yellow, and olive. It is stratified sandy, loamy, or clayey soil in the fine earth fraction.

Appling Series

The soils of the Appling series are very deep and well drained. They formed in materials weathered from acid crystalline rocks. They are on uplands in the Piedmont physiographic province. Slopes range from 2 to 15 percent.

The Appling soils are near Louisburg, Mattaponi, and Roanoke soils. The Appling soils contain more clay in the subsoil than the Louisburg soils and are better drained than the Mattaponi and Roanoke soils.

Typical profile of Appling gravelly coarse sandy loam, 2 to 7 percent slopes, about 1 mile south of the junction of Highways VA-627 and VA-633 and 85 yards west of Highway VA-633, about 1 mile south of Brink:

Oi—2 inches to 0; partially decomposed leaves and twigs.
A—0 to 1 inch; dark grayish brown (10YR 4/2) gravelly coarse sandy loam; moderate fine granular structure; very friable; many fine, medium, and coarse roots; 20 percent gravel; very strongly acid; abrupt smooth boundary.
E—1 to 12 inches; light yellowish brown (10YR 6/4) gravelly coarse sandy loam; massive; friable; many fine medium and coarse roots; 20 percent gravel; very strongly acid; clear smooth boundary.
Bt1—12 to 24 inches; yellowish red (5YR 5/8) clay; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; common fine and medium roots; many prominent clay films on faces of peds; 4 percent gravel; strongly acid; diffuse smooth boundary.
Bt2—24 to 30 inches; yellowish red (5YR 5/8) clay; common medium distinct light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; common fine and medium roots; many prominent clay films on faces of peds; 5 percent gravel; strongly acid; gradual smooth boundary.
Bt3—30 to 43 inches; yellowish red (5YR 5/8) clay; common medium distinct reddish yellow (7.5YR 6/6) mottles; weak medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; many prominent clay films on faces of peds; 5 percent gravel; very strongly acid; diffuse smooth boundary.
C—43 to 63 inches, yellowish red (5YR 5/8) saprolite

that has a sandy loam texture; common medium distinct reddish yellow (7.5YR 6/6) mottles; massive; friable, slightly sticky, slightly plastic; few fine roots; 5 percent gravel; very strongly acid.

The solum thickness ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 15 to 30 percent in the A and E horizons, from 0 to 10 percent in the Bt horizon, and from 0 to 35 percent in the C horizon. Reaction in unlimed areas is very strongly acid or strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 through 4. It mainly is coarse sandy loam, fine sandy loam, or sandy loam in the fine earth fraction; it is sandy clay loam in eroded areas.

Some pedons have an Ap horizon with hue of 5YR through 2.5Y, value of 3 through 5, and chroma of 2 through 6. It mainly is coarse sandy loam, fine sandy loam, or sandy loam in the fine earth fraction; it is sandy clay loam in eroded areas.

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 through 8. It mainly is coarse sandy loam, fine sandy loam, or sandy loam in the fine earth fraction; it is sandy clay loam in eroded areas.

The Bt horizon has hue of 5YR through 10YR, value of 5 or 6, and chroma of 6 through 8. The lower part of the Bt horizon is mottled red, yellow, brown, and white. It is sandy clay, clay loam, or clay.

The C horizon has hue of 5YR through 10YR, value of 5 or 6, and chroma of 6 through 8 or is mottled red, yellow, brown, and white. It is sandy clay loam, loam, or sandy loam in the fine earth fraction.

Bojac Series

The soils of the Bojac series are very deep and well drained. They formed in loamy and sandy, unconsolidated, fluvial sediments. They are on flood plains in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 0 to 2 percent.

The Bojac soils are near Altavista, Roanoke, and Tarboro soils. The Bojac soils are better drained than the Altavista or Roanoke soils and contain more clay in the subsoil than the Tarboro soils.

Typical profile of Bojac loamy fine sand, 0 to 2 percent slopes, frequently flooded, about 1.3 miles west-southwest of the junction of Highways VA-625 and VA-622 and 0.5 mile south of Highway VA-625, about 2 miles southwest of Bryants Corner:

Ap—0 to 8 inches; brown (10YR 4/3) loamy fine sand; single grain; loose; many fine roots; neutral; abrupt smooth boundary.

Bt1—8 to 13 inches; yellowish brown (10YR 5/6) fine sandy loam; many medium faint dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; very friable; common fine roots; many distinct clay films and bridges on sand grains; strongly acid; diffuse smooth boundary.

Bt2—13 to 25 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; many distinct clay films and bridges on sand grains; very strongly acid; diffuse smooth boundary.

Bt3—25 to 37 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; many distinct clay films and bridges on sand grains; very strongly acid; diffuse smooth boundary.

Bt4—37 to 47 inches; yellowish brown (10YR 5/8) fine sandy loam; many medium distinct very pale brown (10YR 7/4) mottles; weak medium subangular blocky structure; very friable; many distinct clay films and bridges on sand grains; very strongly acid; diffuse smooth boundary.

C1—47 to 70 inches; very pale brown (10YR 7/3) loamy fine sand; single grain; loose; strongly acid; diffuse smooth boundary.

C2—70 to 85 inches; yellow (10YR 7/6) coarse sand, common medium faint yellowish brown (10YR 5/6) mottles; single grain; loose; 2 percent rounded gravel; very strongly acid.

The solum thickness ranges from 30 to 65 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 5 percent in the solum and 0 to 50 percent in the C horizon. Reaction in unlimed areas is very strongly acid through slightly acid in the solum and very strongly acid through moderately acid in the C horizon.

Some pedons have an A horizon with hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 through 3. It is loam, fine sandy loam, sandy loam, loamy sand, or loamy fine sand.

The Ap horizon has hue of 7.5YR through 2.5Y, value of 3 through 6, and chroma of 1 through 4. It is loam, fine sandy loam, sandy loam, loamy sand, or loamy fine sand.

Some pedons have an E horizon with hue of 10YR or 2.5Y, value of 4 through 7, and chroma of 4 through 6. It is loam, fine sandy loam, sandy loam, loamy sand, or loamy fine sand.

The Bt horizon has hue of 5YR through 10YR, value

of 4 through 6, and chroma of 4 through 8. It mainly is loam, sandy loam, or fine sandy loam. Some subhorizons are sandy clay loam or clay loam.

The C horizon has hue of 7.5YR through 2.5Y, value of 4 through 7, and chroma of 3 through 8. It is stratified loamy fine sand to coarse sand in the fine earth fraction.

Chenneby Series

The soils of the Chenneby series are very deep and somewhat poorly drained. They formed in silty, unconsolidated, fluvial sediments. They are on flood plains in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 0 to 2 percent.

The Chenneby soils are near Riverview and Tarboro soils but are wetter than those soils.

Typical profile of Chenneby silt loam, 0 to 2 percent slopes, frequently flooded, about 1.8 miles north-northeast of the junction of Highways VA-730 and VA-629 and 20 yards south of the Meherrin River, about 4 miles southeast of Emporia:

Oi—1 inch to 0; undecomposed and partially decomposed leaves and twigs.

A—0 to 3 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; common fine flakes of mica; very strongly acid; clear smooth boundary.

Bw1—3 to 13 inches; brown (7.5YR 4/4) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; common fine flakes of mica; very strongly acid; clear smooth boundary.

Bw2—13 to 20 inches; dark brown (7.5YR 4/2) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many fine and medium roots; common fine flakes of mica; strongly acid; gradual smooth boundary.

Bw3—20 to 32 inches; mottled brown (10YR 4/3), grayish brown (2.5Y 5/2), and black (10YR 2/1) silty clay loam; weak medium and fine subangular blocky structure; friable, sticky, plastic; many fine roots; common fine flakes of mica; few fine black concretions; strongly acid; diffuse smooth boundary.

Bw4—32 to 47 inches; mottled brown (7.5YR 4/4), light gray (10YR 7/2), and black (10YR 2/1) silty clay loam; weak medium and coarse subangular blocky structure; friable, sticky, plastic; many fine roots; common fine flakes of mica; common fine black concretions; very strongly acid; gradual smooth boundary.

Cg—47 to 62 inches; mottled light gray (2.5Y 7/2), brown (7.5YR 4/4), and black (10YR 2/1) loam; massive; friable, slightly sticky, slightly plastic; few fine roots; many fine flakes of mica; common fine black concretions; very strongly acid.

The solum is 40 to 70 inches thick. The depth to bedrock is more than 60 inches. Reaction in unlimed areas is very strongly acid to moderately acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 2 through 4. It is silt loam, loam, or silty clay loam.

Some pedons have an Ap horizon. This horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 2 through 4. It is silt loam, loam, or silty clay loam.

The Bw horizon has hue of 5YR through 2.5Y, value of 4 through 6, and chroma of 2 through 6. The upper part of the Bw horizon is mottled brown, yellow, and gray. The lower part is mottled red, yellow, brown, gray, and olive. The Bw horizon is loam, silt loam, or silty clay loam.

The Cg horizon is mottled gray, yellow, and brown. It is loam, sandy loam, clay loam, or sandy clay loam. Some profiles have a 2Cg horizon of stratified sand, silt, and gravel.

Craven Series

The soils of the Craven series are very deep and moderately well drained. They formed in clayey, unconsolidated, fluvial and marine sediments. They are on uplands in the Coastal Plain physiographic province. Slopes range from 2 to 12 percent.

The Craven soils are near Appling, Uchee, and Woodington soils. The Craven soils are wetter than the Appling or Uchee soils and better drained than the Woodington soils.

Typical profile of Craven clay loam, 6 to 12 percent slopes, severely eroded, about 0.9 mile west-northwest of the junction of Highway VA-632 and VEPCO power line and 1.2 miles northeast of the junction of Highways VA-633 and VA-632, about 2.8 miles south of Brink:

Ap—0 to 4 inches; brown (10YR 5/3) clay loam; weak fine granular structure; friable, sticky, plastic; many fine roots; strongly acid; abrupt smooth boundary.

Bt1—4 to 12 inches; yellowish brown (10YR 5/6) clay; many medium distinct red (10R 4/6) and pale yellow (2.5Y 7/4) mottles; weak medium subangular blocky

structure; firm, sticky, plastic; many fine roots; many distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt2—12 to 28 inches; strong brown (7.5YR 5/8) clay, many medium distinct red (10R 4/6) and gray (10YR 6/1) mottles; weak medium subangular blocky structure; firm, sticky, plastic; common fine roots; many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.

Bt3—28 to 35 inches; yellowish brown (10YR 5/8) clay; many medium distinct red (10R 4/6) and gray (10YR 6/1) mottles; weak medium subangular blocky structure; firm, sticky, plastic; common fine roots; many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.

BCt—35 to 42 inches; light gray (10YR 7/1) sandy clay; many medium prominent red (10R 4/6) mottles; weak coarse subangular blocky structure; firm, sticky, plastic; many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.

C—42 to 60 inches; light gray (10YR 7/1) sandy clay loam; many medium prominent dusky red (10R 3/3) and yellowish brown (10YR 5/6) mottles; massive; firm, sticky, plastic; very strongly acid.

The solum thickness ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. Reaction in unlimed areas is very strongly acid or strongly acid.

Some pedons have an A horizon with hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 through 3. It is clay loam or fine sandy loam.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 through 3. It is loam or fine sandy loam or clay loam in eroded areas.

The Bt horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 4 through 8. The lower part of the Bt is mottled red, yellow, brown, and gray. The Bt horizon is clay loam or clay.

The BCt horizon has hue of 10YR or 2.5Y, value of 5 through 7, and chroma of 1 or 2. It has red, yellow, and brown mottles. It is clay loam, sandy clay loam, clay, or sandy clay.

The C horizon is mottled gray, olive, red, yellow, and brown. It is sandy clay loam or sandy loam.

Dothan Series

The soils of the Dothan series are very deep and well drained. They formed in loamy, unconsolidated, fluvial and marine sediments. They are on uplands in the Coastal Plain physiographic province. Slopes range from 0 to 2 percent.

The Dothan soils are near Mattaponi and Woodington soils. The Dothan soils have a thicker solum and less clay in the subsoil than the Mattaponi soils and are better drained than the Woodington soils.

Typical profile of Dothan loamy sand, 0 to 2 percent slopes, about 145 yards west of the junction of Highways VA-627 and VA-675, and 70 yards south of Highway VA-675, about 5 miles southwest of Emporia:

Ap—0 to 9 inches; brown (10YR 5/3) loamy sand; massive; very friable; many fine roots; moderately acid; abrupt smooth boundary.

E—9 to 17 inches; pale brown (10YR 6/3) sandy loam; massive; friable; common fine roots; strongly acid; clear smooth boundary.

Bt1—17 to 31 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, sticky, slightly plastic; common fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; 4 percent rounded gravel and iron concretions; very strongly acid; diffuse smooth boundary.

Bt2—31 to 44 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable, sticky, slightly plastic; common fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; 4 percent rounded gravel and iron concretions; very strongly acid; clear wavy boundary.

Btv1—44 to 63 inches; yellowish brown (10YR 5/8) sandy clay; many medium distinct light gray (10YR 7/2), and dark red (10R 3/6) mottles; moderate very thick platy structure parting to weak coarse subangular blocky; firm, sticky, slightly plastic; many distinct clay films and bridges on sand grains, many distinct clay films on faces of peds; 10 percent nonindurated plinthite nodules; very strongly acid; diffuse wavy boundary.

Btv2—63 to 78 inches; yellowish brown (10YR 5/8) sandy clay loam; many medium distinct red (2.5YR 4/6) and light gray (10YR 7/2) mottles; moderate very thick platy structure parting to weak coarse subangular blocky; firm, sticky, slightly plastic; many distinct clay films and bridges on sand grains, many distinct clay films on faces of peds; 10 percent nonindurated plinthite nodules; very strongly acid.

The solum thickness and the depth to bedrock are more than 60 inches. The depth to horizons with more than 5 percent nonindurated plinthite ranges from 24 to

60 inches. The content of rock fragments ranges from 0 to 5 percent in the solum. Reaction in unlimed areas is very strongly acid through moderately acid.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 through 7, and chroma of 2 through 4. It is sandy loam or loamy sand.

The E horizon has hue of 10YR or 2.5Y, value of 4 through 7, and chroma of 2 through 4. It is sandy loam or loamy sand.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 through 8, and chroma of 6 through 8. It mainly is sandy loam, sandy clay loam, or clay loam, but the range is to sandy clay in the lower portion.

The Btv horizon has hue of 10YR or 2.5Y, value of 5 through 7, and chroma of 4 through 8. It is mottled red, white, brown, and gray. It contains from 5 to 25 percent nonindurated plinthite. It is sandy loam, sandy clay loam, clay loam, or sandy clay.

Emporia Series

The soils of the Emporia series are very deep and well drained. They formed in loamy, unconsolidated, marine sediments. They are on uplands in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 2 to 6 percent.

The Emporia soils are near Craven, Uchee, and Woodington soils. The Emporia soils contain less clay in the subsoil than the Craven soils, have a thinner surface layer than the Uchee soils, and are better drained than the Woodington soils.

Typical profile of Emporia loamy fine sand, 2 to 6 percent slopes, about 0.5 mile west of the junction of Highways US-301 and VA-642 and 35 yards north of Highway VA-642, about 2 miles south of Skippers (fig. 7):

Ap—0 to 6 inches; pale brown (10YR 6/3) loamy fine sand; weak fine granular structure; very friable; many fine, medium, and coarse roots; strongly acid; clear smooth boundary.

E—6 to 15 inches; pale brown (10YR 6/3) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual smooth boundary.

Bt1—15 to 32 inches; yellowish brown (10YR 5/6) sandy clay loam; few medium distinct yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; strongly acid; diffuse smooth boundary.

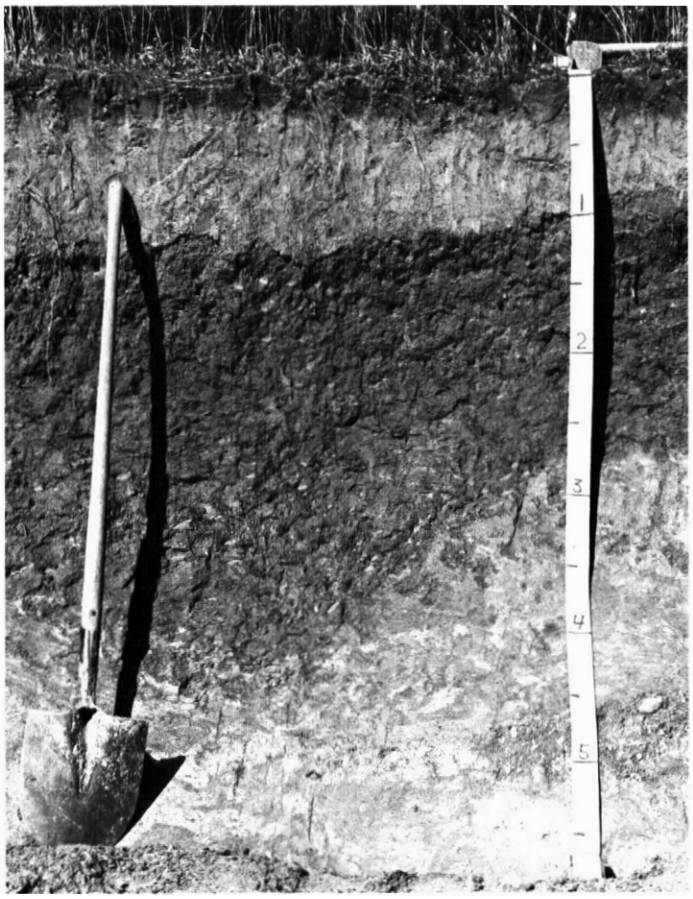

Figure 7.—Typical profile of Emporia loamy fine sand, 2 to 6 percent slopes. The increments on the marker are in feet.

Bt2—32 to 44 inches; yellowish brown (10YR 5/6) clay loam; many medium prominent red (10R 4/8) mottles; weak very thick platy structure parting to moderate medium subangular blocky; friable, sticky, slightly plastic; few fine and medium roots; many distinct clay films and bridges on sand grains, many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.

Bt3—44 to 57 inches; yellowish brown (10YR 5/6) sandy clay loam; many medium distinct light gray (10YR 6/1) and yellowish red (5YR 5/8) mottles; weak very thick platy structure parting to weak medium subangular blocky; friable, firm, slightly sticky, slightly plastic; many distinct clay films and bridges on sand grains, common distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.

C—57 to 70 inches; mottled yellow (2.5Y 7/6), light gray (10YR 7/1), and reddish brown (5YR 5/4) sandy

clay loam; massive; friable, firm, slightly sticky, slightly plastic; very strongly acid.

The solum thickness ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 15 percent in the solum and from 0 to 35 percent in the C horizon. Reaction in unlimed areas is very strongly acid or strongly acid.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 through 4. It is loam, fine sandy loam, sandy loam, loamy fine sand, or loamy sand.

The E horizon has hue of 10YR or 2.5Y, value of 5 through 7, and chroma of 3 or 4. It is loam, fine sandy loam, sandy loam, loamy fine sand, or loamy sand.

The upper part of the Bt horizon has matrix colors and mottles with hue of 5YR through 10YR, value of 4 through 6, and chroma of 3 through 8. The lower part of the Bt horizon has matrix colors and mottles with hue of 5YR through 2.5Y or is neutral, has value of 4 through 6, and has chroma of 0 through 8. The Bt horizon mainly is loam, fine sandy loam, sandy clay loam, or clay loam, but the range is to sandy clay or clay in the lower part.

The C horizon is mottled with hue of 5YR through 5Y or is neutral, has value of 3 through 8, and has chroma of 0 through 8. It ranges from sandy loam to clay in the fine earth fraction.

Faceville Series

The soils of the Faceville series are very deep and well drained. They formed in clayey, unconsolidated, marine sediments. They are on uplands in the Coastal Plain physiographic province. Slopes range from 0 to 2 percent.

The Faceville soils are near Emporia and Uchee soils. The Faceville soils have more clay in the subsoil than the Emporia soils and a thinner surface layer than the Uchee soils.

Typical profile of Faceville loamy sand, 0 to 2 percent slopes, about 1 mile south-southeast of the junction of Highways VA-627 and VA-603 and 1.2 miles south-southwest of the junction of Highways VA-627 and VA-659, about 3.5 miles west-southwest of Brink:

Ap—0 to 8 inches; yellowish brown (10YR 5/4) loamy sand; massive; very friable; few fine roots; moderately acid; abrupt smooth boundary.

E—8 to 11 inches; light yellowish brown (10YR 6/4) sandy loam; massive; very friable, slightly sticky; few fine roots; slightly acid; clear smooth boundary.

Bt1—11 to 25 inches; yellowish red (5YR 5/8) sandy clay; moderate medium subangular blocky structure; friable, sticky, plastic; few fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; strongly acid; diffuse smooth boundary.

Bt2—25 to 44 inches; yellowish red (5YR 5/8) sandy clay; moderate medium subangular blocky structure; friable, sticky, plastic; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; very strongly acid; diffuse smooth boundary.

Bt3—44 to 57 inches; red (2.5YR 4/8) sandy clay; common medium distinct reddish yellow (7.5YR 6/8) and brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; friable, sticky, plastic; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; very strongly acid; diffuse smooth boundary.

Bt4—57 to 68 inches; red (2.5YR 4/8) sandy clay; common medium distinct reddish yellow (7.5YR 6/8), brownish yellow (10YR 6/6), and very pale brown (10YR 7/3) mottles; moderate medium subangular blocky structure; friable, sticky, plastic; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; very strongly acid.

The solum thickness and the depth to bedrock are more than 60 inches. The content of rock fragments ranges from 0 to 10 percent in the A and E horizons and from 0 to 3 percent in the Bt horizon. Reaction in unlimed areas is very strongly acid or strongly acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4. It is loamy sand or sandy loam.

The E horizon has hue of 7.5YR or 10YR, value of 6, and chroma of 3 or 4. It is loamy sand or sandy loam.

The Bt horizon has hue of 10R through 7.5YR, with hue of 7.5YR limited to the upper part of the Bt horizon; value of 4 or 5; and chroma of 6 through 8. The lower part of the Bt horizon is mottled brown and yellow in some profiles. The Bt horizon is clay loam, sandy clay, or clay.

Fluvanna Series

The soils of the Fluvanna series are very deep and well drained. They formed in materials weathered from basic crystalline rocks and consolidated metasediments. They are on uplands in the Piedmont physiographic

province. Slopes range from 2 to 15 percent.

The Fluvanna soils are near Goldston, Mattaponi, and Roanoke soils. The Fluvanna soils are deeper than the Goldston soils and better drained than the Mattaponi and Roanoke soils.

Typical profile of Fluvanna fine sandy loam, in an area of Fluvanna-Mattaponi complex, 2 to 7 percent slopes, about 0.9 mile north of the junction of Highways VA-633 and VA-603 and 0.5 mile west of Highway VA-633, about 3 miles southwest of Brink:

Oi—3 inches to 0; partially decomposed leaves and twigs.

A—0 to 1 inch; very dark grayish brown (10YR 3/2) fine sandy loam; moderate fine granular structure; very friable; many fine, medium, and coarse roots; 4 percent gravel; very strongly acid; clear smooth boundary.

E—1 to 5 inches; yellowish brown (10YR 5/4) fine sandy loam; moderate fine granular structure; friable; many fine, medium, and coarse roots; 4 percent gravel; very strongly acid; clear smooth boundary.

Bt1—5 to 11 inches; strong brown (7.5YR 5/6) clay loam; many medium distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable, sticky, plastic; many fine, medium, and coarse roots; many distinct clay films on faces of peds; 2 percent gravel; very strongly acid; gradual smooth boundary.

Bt2—11 to 23 inches; strong brown (7.5YR 5/6) clay; common medium distinct yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; many prominent clay films on faces of peds; 1 percent gravel; very strongly acid; gradual smooth boundary.

Bt3—23 to 44 inches; yellowish red (5YR 4/8) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; common fine and medium roots; many prominent clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt4—44 to 55 inches; yellowish red (5YR 5/6) silty clay; many medium distinct brownish yellow (10YR 6/6) and dark red (10R 3/6) mottles; moderate thick platy structure parting to moderate medium subangular blocky; firm, sticky, plastic; few fine roots; many prominent clay films on faces of peds; 10 percent gravel; very strongly acid; diffuse smooth boundary.

C1—55 to 70 inches; mottled dark red (10R 3/6), yellowish red (5YR 4/6), and brownish yellow (10YR 6/6) silty clay loam; massive; friable, sticky, plastic; few fine roots; 10 percent gravel; very strongly acid; diffuse smooth boundary.

C2—70 to 99 inches; mottled brownish yellow (10YR 6/6), black (10YR 2/1), and dark red (10R 3/6) silty clay loam; massive; friable, sticky, plastic; 10 percent gravel; very strongly acid.

The solum thickness ranges from 30 to 60 inches. The depth to hard bedrock is more than 72 inches. The content of rock fragments ranges from 2 to 15 percent in the A and E horizons, from 0 to 10 percent in the Bt horizon, and from 5 to 40 percent in the C horizon. Reaction in unlimed areas is very strongly acid or strongly acid.

The A horizon has hue of 7.5YR through 2.5Y, value of 3 or 4, and chroma of 1 through 4. It mainly is fine sandy loam or loam. It is clay loam in eroded areas.

The E horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 3 through 6. It is fine sandy loam or loam.

The Bt horizon has hue of 5YR through 10YR, value of 4 through 6, and chroma of 4 through 8. It is clay, silty clay, clay loam, or silty clay loam. The lower part of the Bt is mottled red, yellow, brown, and white.

The C horizon is mottled red, brown, and yellow. It is silty clay loam, loam, or clay loam in the fine earth fraction.

Georgeville Series

The soils of the Georgeville series are very deep and well drained. They formed in materials weathered from acid crystalline rocks and consolidated metasediments. They are on uplands in the Piedmont physiographic province. Slopes range from 2 to 15 percent.

The Georgeville soils are near Goldston, Iredell, and Roanoke soils. The Georgeville soils are deeper than the Goldston soils and better drained than the Iredell and Roanoke soils.

Typical profile of Georgeville loam, 2 to 7 percent slopes, about 0.4 mile east of the junction of the Brunswick County line and Highway VA-602 and 35 yards north of Highway VA-602, about 5 miles west of Brink:

Ap—0 to 8 inches; yellowish brown (10YR 5/6) loam; moderate medium and fine granular structure; friable, slightly sticky, slightly plastic; many fine and medium roots; 5 percent rounded gravel; strongly acid; abrupt smooth boundary.

Bt1—8 to 12 inches; yellowish red (5YR 5/8) silty clay loam; weak medium subangular blocky structure; friable, sticky, plastic; many fine and medium roots; many prominent clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—12 to 25 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; many prominent clay films on faces of peds; strongly acid; diffuse smooth boundary.

Bt3—25 to 36 inches; red (2.5YR 4/8) clay; few fine distinct brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; many prominent clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt4—36 to 45 inches; red (2.5YR 4/8) silty clay; many medium distinct brownish yellow (10YR 6/6) mottles; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few fine and medium roots; many prominent clay films on faces of peds; strongly acid; diffuse smooth boundary.

C—45 to 60 inches; mottled brownish yellow (10YR 6/6), red (10R 4/8), white (10YR 8/2), and weak red (10R 5/4) loam; massive; friable, slightly sticky, slightly plastic; few fine roots; strongly acid.

The solum thickness ranges from 40 to 70 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 5 percent throughout. Reaction in unlimed areas is very strongly acid or strongly acid.

The A horizon has hue of 5YR through 10YR, value of 4 or 5, and chroma of 3 through 8. It is loam or silt loam.

The Ap horizon has hue of 5YR through 10YR, value of 4 or 5, and chroma of 3 through 8. It mainly is loam or silt loam but is silty clay loam or clay loam in eroded areas.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 through 8; the hue of 5YR is limited to the upper part. The Bt horizon is clay, silty clay, silty clay loam, or clay loam.

The C horizon is mottled red, yellow, brown, and black. It is silt loam, fine sandy loam, or loam.

Goldston Series

The soils of the Goldston series are shallow and well drained. They formed in materials weathered from consolidated metasediments. They are on uplands in the Piedmont physiographic province. Slopes range from 2 to 15 percent.

The Goldston soils are near Fluvanna, Mattaponi, and Roanoke soils but are shallower and have more slate fragments than those soils.

Typical profile of Goldston channery silt loam, in an area of Fluvanna-Goldston complex, 7 to 15 percent slopes, severely eroded, about 0.8 mile south-southeast of the junction of Highway VA-601 and the Brunswick County line, about 1.6 miles northwest of Barley:

Ap—0 to 6 inches; grayish brown (10YR 5/2) channery silt loam; moderate fine granular structure; friable; many fine, medium, and coarse roots; 30 percent slate fragments; strongly acid; clear wavy boundary.

Bw—6 to 19 inches; light yellowish brown (10YR 6/4) very channery silt loam; weak fine subangular blocky structure; friable; many fine and medium roots; many silt coatings on slate fragments; 40 percent weathered slate fragments; strongly acid; diffuse wavy boundary.

Cr—19 to 26 inches; light gray (10YR 7/1) highly weathered slate fragments; few fine roots down cracks greater than 4 inches wide; common silt coatings on slate fragments; gradual wavy boundary.

R—26 inches; light gray (10YR 7/1) hard slate.

The solum thickness and the depth to soft bedrock are 10 to 20 inches. The depth to hard bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 15 to 50 percent in the A and Ap horizons, ranges from 35 to 75 percent in the Bw horizon, and is more than 60 percent in the C and Cr horizons. Reaction in unlimed areas is extremely acid to moderately acid.

Some pedons have an A horizon that has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 through 3. It is silt loam or very fine sandy loam in the fine earth fraction.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 through 3. It is silt loam or very fine sandy loam in the fine earth fraction.

The Bw horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 3 through 8. It is mottled olive, yellow, brown, and red in some profiles. It is silt loam or fine sandy loam in the fine earth fraction.

The C and Cr horizons have hue of 7.5YR through 2.5Y, value of 4 through 7, and chroma of 1 through 8. They are mottled olive, yellow, brown, red, and gray in some profiles.

Helena Series

The soils of the Helena series are deep and moderately well drained. They formed in materials weathered from acid crystalline rocks. They are on uplands in the Piedmont physiographic province. Slopes range from 2 to 7 percent.

The Helena soils are near Appling, Georgeville, and Roanoke soils. The Helena soils are wetter than the Appling and Georgeville soils and better drained than the Roanoke soils.

Typical profile of Helena gravelly coarse sandy loam, 2 to 7 percent slopes, about 565 yards west-southwest of the junction of Highways VA-659 and VA-603 and 1.4 miles south-southwest of the junction of Highways VA-627 and VA-603, about 3 miles east of Barley:

Ap—0 to 6 inches; dark brown (10YR 4/3) gravelly coarse sandy loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; many fine roots; 25 percent gravel; strongly acid; abrupt smooth boundary.

Bt1—6 to 18 inches; yellowish brown (10YR 5/6) clay; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; common fine roots; many prominent clay films on faces of peds; 5 percent gravel; strongly acid; gradual smooth boundary.

Bt2—18 to 30 inches; yellowish brown (10YR 5/8) clay; many medium distinct light gray (10YR 7/1) and red (10R 4/6) mottles; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; few fine roots; many prominent clay films on faces of peds; 5 percent gravel; very strongly acid; gradual smooth boundary.

C—30 to 50 inches; mottled light gray (10YR 7/1), brownish yellow (10YR 6/8), and red (10R 5/8) clay loam; massive; firm, sticky, plastic; 5 percent gravel; very strongly acid; diffuse smooth boundary.

Cg—50 to 60 inches; light gray (10YR 7/1) saprolite that crushes to clay loam, common medium distinct brownish yellow (10YR 6/8) mottles; massive; firm, sticky, plastic; 5 percent gravel; very strongly acid.

The solum thickness ranges from 20 to 48 inches. The depth to bedrock is 48 to 60 inches. The content of rock fragments ranges from 15 to 35 percent in the surface layers and 0 to 15 percent in the Bt and C horizons. Reaction in unlimed areas is very strongly acid or strongly acid.

Some pedons have an A horizon that has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 through 4. It is sandy loam or coarse sandy loam in the fine earth fraction.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 through 4. It is sandy loam or coarse sandy loam in the fine earth fraction.

The Bt horizon has hue of 7.5YR through 2.5Y, value of 5 through 8, and chroma of 3 through 8. The lower part of the Bt horizon is mottled gray, yellow, brown, white, and olive. It is clay, sandy clay, or clay loam.

The C horizon has hue of 7.5YR through 2.5Y, value of 5 through 8, and chroma of 1 through 8 and is mottled throughout. It is clay loam or sandy clay loam.

The Cg horizon has hue of 7.5YR through 2.5Y, value of 5 through 8, and chroma of 1 or 2 and is mottled throughout. It is saprolite that crushes to clay loam or sandy clay loam.

Iredell Series

The soils of the Iredell series are deep and very deep and somewhat poorly drained. They formed in materials weathered from basic crystalline rocks. They are on uplands in the Piedmont physiographic province. Slopes range from 2 to 15 percent.

The Iredell soils are near Fluvanna, Goldston, and Roanoke soils. The Iredell soils are wetter than the Fluvanna and Goldston soils and better drained than the Roanoke soils.

Typical profile of Iredell loam, 2 to 7 percent slopes, about 530 yards northwest of the junction of Highways VA-603 and VA-604 and 200 yards west of Highway VA-603, about 4 miles west of Brink:

A—0 to 3 inches; grayish brown (10YR 5/2) loam; weak fine granular structure; friable; many fine, medium, and coarse roots; 2 percent fine black concretions; strongly acid; clear smooth boundary.

E—3 to 7 inches; light gray (10YR 7/2) loam; common medium distinct strong brown (7.5YR 5/8) mottles; massive; friable; common fine, medium, and coarse roots; 6 percent fine black concretions; strongly acid; clear smooth boundary.

Bt1—7 to 26 inches; yellowish brown (10YR 5/6) clay; common medium distinct yellow (10YR 7/6) mottles; moderate medium subangular blocky structure; firm, very sticky, very plastic; few fine and medium roots; many prominent clay films on faces of peds; common slickensides and pressure faces; slightly acid; gradual smooth boundary.

Bt2—26 to 31 inches; yellowish brown (10YR 5/6) clay; common medium distinct light gray (10YR 6/1) and yellow (10YR 7/6) mottles; moderate medium

subangular blocky structure; firm, very sticky, very plastic; few fine and medium roots; many prominent clay films on faces of peds; common slickensides and pressure faces; slight effervescence; neutral; clear wavy boundary.

C—31 to 60 inches; strong brown (7.5YR 5/6) saprolite that crushes to silty clay loam; massive; very firm, sticky, plastic; many prominent black coatings along fracture planes; slight effervescence; neutral.

The solum thickness ranges from 20 to 40 inches. The depth to bedrock is more than 40 inches. The content of rock fragments ranges from 0 to 25 percent in the A and E horizons and 0 to 15 percent in the Bt horizon. The content of iron and manganese concretions ranges from 0 to 10 percent throughout. Secondary carbonate concretions that effervesce with dilute hydrochloric acid are in the lower parts of most profiles. Few to common slickensides and pressure faces are in the Bt horizon. Reaction is strongly acid to neutral in the A and E horizons, slightly acid to mildly alkaline in the Bt horizon, and neutral to moderately alkaline in the C horizon.

The A horizon has hue of 10YR through 5Y, value of 4 or 5, and chroma of 2 through 4. It is fine sandy loam or loam in the fine earth fraction.

Some pedons have an Ap horizon that has hue of 10YR through 5Y, value of 4 or 5, and chroma of 2 through 4. It mainly is fine sandy loam or loam in the fine earth fraction but is clay loam in eroded areas.

The E horizon has 10YR or 2.5Y, value of 6 or 7, and chroma of 1 through 3. It is fine sandy loam or loam in the fine earth fraction.

The Bt horizon has hue of 10YR through 5Y, value of 4 or 5, and chroma of 4 through 6. It is clay, sandy clay loam, or clay loam. The lower part is mottled gray.

The C or Cr horizon is mottled brown, yellow, black, white, and gray. It is saprolite that crushes to various textures.

Louisburg Series

The soils of the Louisburg series are deep and well drained. They formed in materials weathered from acid crystalline rocks. They are on uplands in the Piedmont physiographic province. Slopes range from 2 to 25 percent.

The Louisburg soils are near Appling, Mattaponi, and Roanoke soils. The Louisburg soils contain less clay in the subsoil than the Appling and Mattaponi soils and are better drained than the Roanoke soils.

Typical profile of Louisburg gravelly coarse sandy loam, Appling-Louisburg complex, 7 to 15 percent slopes, about 1.5 miles west of the junction of Highways VA-627 and VA-633, and 1 mile north of Highway VA-627, about 1.5 miles west of Brink:

Oe—1 inch to 0; partially decomposed leaves and twigs.

A—0 to 5 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam; weak medium and fine granular structure; very friable; many fine medium and coarse roots; 20 percent gravel; very strongly acid; clear smooth boundary.

E—5 to 11 inches; yellowish brown (10YR 5/4) gravelly coarse sandy loam; massive; friable; many fine medium and coarse roots; 25 percent gravel; strongly acid; gradual smooth boundary.

Bw—11 to 24 inches; brownish yellow (10YR 6/6) gravelly coarse sandy loam; weak medium subangular blocky structure interrupted by lenses and irregularly shaped bodies of yellowish brown (10YR 5/8) gravelly sandy clay loam with moderate fine subangular blocky structure and many distinct clay films on faces of peds; friable, slightly sticky, slightly plastic; common fine and medium roots; 25 percent gravel; moderately acid; diffuse smooth boundary.

C1—24 to 39 inches; mottled brownish yellow (10YR 6/6) and strong brown (7.5YR 5/6) partially decomposed granite rock that crushes to gravelly coarse sandy loam under moderate pressure; massive; firm, slightly sticky, slightly plastic; common fine and medium roots; 30 percent gravel; strongly acid; diffuse smooth boundary.

C2—39 to 60 inches; mottled brownish yellow (10YR 6/6) and strong brown (7.5YR 5/6) partially decomposed granite rock that crushes to gravelly coarse sandy loam under moderate pressure; massive; firm, slightly sticky, slightly plastic; few fine and medium roots; 30 percent gravel; strongly acid.

The solum thickness ranges from 20 to 40 inches. The depth to bedrock is more than 40 inches. The content of rock fragments ranges from 15 to 35 percent in the soil. Reaction in unlimed areas ranges from very strongly acid to moderately acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 through 4. It is coarse sandy loam and loamy coarse sand in the fine earth fraction.

The E horizon has hue of 7.5YR through 2.5Y, value of 5 or 6, and chroma of 4 through 6. It is coarse sandy loam and loamy coarse sand in the fine earth fraction.

The Bw horizon has hue of 5YR through 2.5Y, value

of 4 through 7, and chroma of 3 through 8. It is coarse sandy loam in the fine earth fraction interrupted by lenses and pockets of sandy loam or sandy clay loam that have clay films on faces of peds.

The C horizon is mottled red, yellow, brown, olive, and gray. It is saprolite that crushes to sandy loam or coarse sandy loam in the fine earth fraction.

Mattaponi Series

The soils of the Mattaponi series are very deep and moderately well drained. They formed in clayey and loamy, unconsolidated, marine sediments. They are on uplands in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 2 to 15 percent.

The Mattaponi soils are near Appling, Uchee, and Woodington soils. The Mattaponi soils are wetter than the Appling and Uchee soils and better drained than the Woodington soils.

Typical profile of Mattaponi sandy loam, 2 to 6 percent slopes, about 525 yards northeast of the junction of Highways VA-629 and VA-626 and 65 yards southeast of Highway VA-629:

Oe—2 inches to 0; partially decomposed leaves and twigs.

A—0 to 4 inches; dark grayish brown (10YR 4/2) sandy loam; massive; very friable; many fine, medium, and coarse roots; very strongly acid; clear smooth boundary.

E—4 to 15 inches; light yellowish brown (2.5Y 6/4) sandy loam; massive; very friable; many fine, medium, and coarse roots; very strongly acid; gradual smooth boundary.

Bt1—15 to 28 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable, sticky, plastic; common fine and medium roots; many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.

Bt2—28 to 41 inches; yellowish brown (10YR 5/6) clay; moderate medium and thick platy structure parting to moderate medium subangular blocky; friable, sticky, plastic; many fine and medium roots; many distinct clay films on faces of peds; strongly acid; diffuse smooth boundary.

Bt3—41 to 51 inches; yellowish brown (10YR 5/6) clay, many medium distinct red (2.5YR 4/6) mottles; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; many distinct clay films on faces of peds; few fine flakes of mica; strongly acid; diffuse wavy boundary.

Bt4—51 to 60 inches; mottled red (2.5YR 4/8), yellowish brown (10YR 5/6), and light gray (10YR 7/1) sandy clay; weak medium subangular blocky structure; firm, slightly sticky, slightly plastic; common distinct clay films on faces of peds; few fine and medium flakes of mica; strongly acid; clear smooth boundary.

C—60 to 69 inches; mottled red (2.5YR 4/8), brownish yellow (10YR 6/6), and light gray (10YR 7/1) sandy clay loam; massive; friable, slightly sticky; strongly acid.

The solum thickness is more than 30 inches. The depth to bedrock is more than 50 inches. The content of rock fragments ranges from 0 to 35 percent in the solum and 0 to 50 percent in the C horizon. Reaction in unlimed areas is very strongly acid or strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 or 3. It is sandy loam or loam in the fine earth fraction.

Some pedons have an Ap horizon that has hue of 5YR through 2.5Y, value of 4 through 7, and chroma of 2 through 6. It mainly is sandy loam or loam in the fine earth fraction but is sandy clay loam, clay loam, or clay in eroded areas.

The E horizon has hue of 10YR or 2.5Y, value of 4 through 7, and chroma of 4 through 8. It is sandy loam or loam in the fine earth fraction.

The Bt horizon has hue of 7.5YR through 2.5Y, value of 4 through 8, and chroma of 3 through 8. It is sandy clay loam, sandy clay, clay loam, or clay in the fine earth fraction. High and low chroma mottles are in the lower part of the Bt horizon.

The C horizon is mottled yellow, brown, gray, and red. It is stratified sandy loam through clay in the fine earth fraction.

Orangeburg Series

The soils of the Orangeburg series are very deep and well drained. They formed in loamy, unconsolidated, marine sediments. They are on uplands in the Coastal Plain physiographic province. Slopes range from 0 to 2 percent.

The Orangeburg soils are near Dothan, Mattaponi, and Uchee soils. The Orangeburg soils have a redder subsoil than the Dothan soils, a thicker solum than the Mattaponi soils, and a thinner surface layer than the Uchee soils.

Typical profile of Orangeburg loamy sand, 0 to 2 percent slopes, about 0.4 mile north-northwest of the junction of Highways VA-627 and VA-675 and 35 yards

east of Highway VA-675, about 5 miles southwest of Emporia:

Ap—0 to 10 inches; brown (10YR 5/3) loamy sand; massive; very friable; many fine and medium roots; moderately acid; abrupt smooth boundary.
E—10 to 16 inches; yellowish brown (10YR 5/6) fine sandy loam; massive; friable, slightly sticky; common fine roots; strongly acid; clear smooth boundary.
Bt1—16 to 37 inches; yellowish red (5YR 4/8) sandy clay loam; weak medium subangular blocky structure; friable, sticky, slightly plastic; common fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; very strongly acid; gradual smooth boundary.
Bt2—37 to 57 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable, sticky, slightly plastic; few fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; very strongly acid; diffuse smooth boundary.
Bt3—57 to 71 inches; red (2.5YR 4/6) sandy clay; weak medium subangular blocky structure; friable, sticky, slightly plastic; few fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; very strongly acid.

The solum thickness is at least 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 3 percent in the solum. Reaction in unlimed areas is very strongly acid to moderately acid.

Some pedons have an A horizon that has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 through 6. It is loamy sand, sandy loam, or fine sandy loam.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 through 6. It is loamy sand, sandy loam, or fine sandy loam.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 4 through 6. It is loamy sand, sandy loam, or fine sandy loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 through 8. It is fine sandy loam or sandy clay loam in the upper part and sandy clay or sandy clay loam in the lower part.

Peawick Series

The soils of the Peawick series are very deep and moderately well drained. They formed in clayey, unconsolidated, fluvial sediments. They are on stream terraces in the Coastal Plain physiographic province. Slopes range from 0 to 12 percent.

The Peawick soils are near Roanoke and State soils. The Peawick soils are better drained than the Roanoke soils and contain more clay in the subsoil than the State soils.

Typical profile of Peawick loam, 0 to 3 percent slopes, about 0.5 mile north-northwest of the junction of Highways VA-622 and VA-625 and 20 yards west of Highway VA-622, about 9 miles southeast of Emporia:

Oe—2 inches to 0; partially decomposed leaves and twigs.
A—0 to 4 inches; yellowish brown (10YR 5/4) loam; massive; friable, slightly sticky, slightly plastic; many fine medium and coarse roots; extremely acid; clear smooth boundary.
Bt1—4 to 10 inches; strong brown (7.5YR 5/6) clay; few medium distinct red (2.5YR 4/6) mottles; moderate fine and medium subangular blocky structure; firm, sticky, plastic; many fine, medium, and coarse roots; many distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.
Bt2—10 to 17 inches; yellowish brown (10YR 5/8) clay; few medium distinct red (2.5YR 4/8) mottles; moderate fine and medium subangular blocky structure; firm, sticky, plastic; many fine, medium, and coarse roots; many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.
Bt3—17 to 33 inches; yellowish brown (10YR 5/6) clay; many medium distinct light gray (5Y 7/2) and yellowish red (5YR 4/8) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; common fine and medium roots; many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.
Bt4—33 to 48 inches; light gray (5Y 7/2) and yellowish brown (10YR 5/8) clay; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; common fine and medium roots; many distinct clay films on faces of peds; extremely acid; diffuse smooth boundary.
Bt5—48 to 65 inches; yellowish brown (10YR 5/6) clay; many medium prominent light gray (5Y 7/2) mottles; weak medium subangular blocky structure; very firm, sticky, plastic; few fine and medium roots; many distinct clay films on faces of peds; few black and brown fine concretions; extremely acid.

The solum thickness and the depth to bedrock are

more than 60 inches. The content of rock fragments ranges from 0 to 15 percent in the solum. Reaction in unlimed areas is extremely acid to strongly acid.

The A horizon has hue of 10YR through 5Y, value of 2 through 4, and chroma of 1 through 4. It is fine sandy loam, loam, or silt loam.

The Ap horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 3 or 4. It mainly is fine sandy loam, loam, or silt loam but is clay loam and silty clay loam in eroded areas.

Some pedons have an E horizon that has hue of 10YR through 2.5Y, value of 5 or 6, and chroma of 2 through 4. It is fine sandy loam, loam, or silt loam.

The upper part of the Bt horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 4 through 8. The lower part of the Bt horizon is mottled gray, red, brown, yellow, and olive. The Bt horizon is clay loam, silty clay loam, silty clay, or clay.

The C horizon has hue of 10YR through 5Y or is neutral. It has value of 4 through 7 and chroma of 0 through 2. It ranges from fine sandy loam to clay.

Riverview Series

The soils of the Riverview series are very deep and well drained. They formed in loamy, unconsolidated, fluvial sediments. They are on flood plains in the Coastal Plain physiographic province. Slopes range from 0 to 2 percent.

The Riverview soils are near Roanoke and Tarboro soils.The Riverview soils are better drained than the Roanoke soils and contain more clay in the subsoil than the Tarboro soils.

Typical profile of Riverview silt loam, 0 to 2 percent slopes, frequently flooded, about 0.9 mile northeast of the junction of Highways VA-730 and VA-622 and 175 yards west of the Meherrin River, about 2.5 miles southeast of Claresville:

Oi—2 inches to 0; partially decomposed leaves and twigs.

A—0 to 6 inches; brown (10YR 4/3) silt loam; weak fine and medium granular structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; many fine flakes of mica; strongly acid; abrupt smooth boundary.

Bw1—6 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; many faint silt coatings on faces of peds; many fine flakes of mica; strongly acid; diffuse smooth boundary.

Bw2—21 to 38 inches; dark yellowish brown (10YR 4/4) loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; many fine, medium, and coarse roots; many silt coatings on faces of peds; many fine flakes of mica; strongly acid; diffuse smooth boundary.

C1—38 to 56 inches; very pale brown (10YR 7/4) sand; many medium distinct yellowish brown (10YR 5/6) mottles; many black manganese stains; single grain; loose; common fine and medium roots; many fine and medium flakes of mica; strongly acid; clear smooth boundary.

C2—56 to 69 inches; dark yellowish brown (10YR 4/4) fine sandy loam; many medium distinct light olive gray (5Y 6/2) mottles; massive; very friable; common fine and medium roots; many fine flakes of mica; strongly acid; clear smooth boundary.

C3—69 to 81 inches; mottled very pale brown (10YR 7/3) and yellow (10YR 7/6) fine sand; many black manganese stains; massive; loose; few fine roots; many fine and medium flakes of mica; strongly acid.

The solum thickness ranges from 24 to 40 inches. The depth to bedrock is more than 60 inches. Reaction in unlimed areas is very strongly acid or strongly acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. It is loam or silt loam.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 through 4. It is loam or silt loam.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 4 through 8. It is silt loam, silty clay loam, sandy clay loam, or loam.

The C horizon has hue of 7.5YR or 10YR, value of 4 through 8, and chroma of 4 through 8. It mainly is mottled with yellow, brown, and gray. It mainly is stratified fine sandy loam, sandy loam, loamy sand, fine sand, or sand but is strata of silt loam or silty clay loam in some profiles.

Roanoke Series

The soils of the Roanoke series are very deep and poorly and very poorly drained. They formed in clayey, unconsolidated, fluvial sediments. They are on flood plains in meander scrolls in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 0 to 2 percent.

The Roanoke soils are near Altavista, Appling, and State soils but are wetter than those soils.

Typical profile of Roanoke loam, 0 to 2 percent slopes, frequently flooded, about 175 yards west-

northwest of the junction of Highways US-301 and VA-628 and 100 yards west of Highway US-301:

Ap—0 to 5 inches; grayish brown (2.5Y 5/2) loam; many medium distinct light olive brown (2.5Y 5/4) mottles; massive; friable, sticky, plastic; many fine roots; strongly acid; abrupt smooth boundary.

Btg1—5 to 16 inches; light brownish gray (2.5Y 6/2) clay loam; many medium distinct light yellowish brown (2.5Y 6/4) and yellowish red (5YR 4/8) mottles; moderate coarse subangular blocky structure; firm, sticky, plastic; common fine roots; many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.

Btg2—16 to 26 inches; light olive gray (5Y 6/2) clay loam; many medium distinct yellowish red (5YR 4/8) and yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure; firm, sticky, plastic; few fine roots; many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.

Btg3—26 to 43 inches; light gray (5Y 6/1) clay; many medium distinct yellowish red (5YR 4/8) and brownish yellow (10YR 6/6) mottles; moderate coarse subangular blocky structure; firm, sticky, plastic; many distinct clay films on faces of peds; very strongly acid; diffuse smooth boundary.

Cg—43 to 74 inches; mottled light gray (N 7/0), gray (10YR 5/1), and yellowish brown (10YR 5/6) clay; massive; firm, sticky, plastic; very strongly acid.

The solum thickness ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 10 percent in the solum and 0 to 50 percent in the Cg horizon. Reaction in unlimed areas is very strongly acid or strongly acid.

The A horizon has hue of 10YR through 5Y, value of 2 or 3, and chroma of 1 or 2. It is loam, silt loam, fine sandy loam, or silty clay loam.

The Ap horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 or 2. It is loam, silt loam, fine sandy loam, or silty clay loam.

The Btg horizon has hue of 10YR through 5Y or is neutral. It has value of 4 through 6 and chroma of 0 or 2. High chroma mottles are common. The Btg horizon is clay, clay loam, silty clay loam, or silty clay.

The Cg horizon is variable in color and texture.

Slagle Series

The soils of the Slagle series are very deep and moderately well drained. They formed in loamy, unconsolidated, marine sediments. They are on uplands in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 0 to 3 percent.

The Slagle soils are near Mattaponi, Uchee, and Woodington soils. The Slagle soils contain less clay in the subsoil than the Mattaponi soils, are better drained than the Woodington soils, and are wetter than the Uchee soils.

Typical profile of Slagle fine sandy loam, 0 to 3 percent slopes, about 0.5 mile north of the junction of Highways I-95 and VA-631 and 135 yards west of I-95, about 8.3 miles south of Emporia:

Ap—0 to 9 inches; pale brown (10YR 6/3) fine sandy loam; weak fine granular structure; very friable; many fine, medium, and coarse roots; 3 percent rounded and angular gravel; very strongly acid; clear smooth boundary.

Bt1—9 to 14 inches; yellowish brown (10YR 5/6) loam; many medium faint very pale brown (10YR 7/4) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; few faint clay films on faces of peds; 3 percent rounded and angular gravel; very strongly acid; gradual smooth boundary.

Bt2—14 to 20 inches; yellowish brown (10YR 5/6) clay loam; weak medium subangular blocky structure; friable, sticky, plastic; common fine, medium, and coarse roots; few faint clay films on faces of peds; 3 percent rounded and angular gravel; very strongly acid; gradual smooth boundary.

Bt3—20 to 30 inches; yellowish brown (10YR 5/8) clay loam; many medium distinct light gray (10YR 7/1) and yellowish red (5YR 4/8) mottles; moderate medium subangular blocky structure; friable, sticky, plastic; common fine, medium, and coarse roots; many distinct clay films on faces of peds; few fine flakes of mica; 3 percent rounded and angular gravel; very strongly acid; diffuse smooth boundary.

Bt4—30 to 55 inches; yellowish brown (10YR 5/8) sandy clay loam; many medium distinct light gray (N 7/0) and light yellowish brown (2.5Y 6/4) mottles; weak medium subangular blocky structure; firm, sticky, plastic; few fine roots; many distinct clay films on faces of peds; few fine flakes of mica; 3 percent rounded and angular gravel; very strongly acid; diffuse smooth boundary.

C—55 to 66 inches; yellowish brown (10YR 5/8) and light gray (N 7/0) sandy clay loam; massive; friable, slightly sticky, slightly plastic; few fine roots; few fine flakes of mica; 3 percent rounded and

angular gravel; very strongly acid.

The solum thickness ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 5 percent in the solum and 0 to 15 percent in the C horizon. Reaction in unlimed areas is extremely acid to strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 through 4. It is fine sandy loam, sandy loam, silt loam, loam, loamy fine sand, or loamy sand.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 through 4. It is fine sandy loam, sandy loam, silt loam, loam, loamy fine sand, or loamy sand.

The Bt horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 4 through 8. It mainly is sandy loam, fine sandy loam, sandy clay loam, loam, or clay loam but is sandy clay or clay in some profiles. The lower part of the Bt horizon is mottled red, brown, yellow, olive, or gray.

The C horizon is mottled red, yellow, brown, olive, and gray. It ranges from sandy loam through clay.

State Series

The soils of the State series are very deep and well drained. They formed in loamy, unconsolidated, fluvial sediments. They are on stream terraces in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 0 to 3 percent.

The State soils are near Altavista, Peawick, and Roanoke soils. The State soils are better drained than those soils and do not have the gray that is typical in the subsoil of those soils.

Typical profile of State loamy sand, 0 to 3 percent slopes, about 2 miles east of the junction of Highways VA-625 and VA-660 and 165 yards south of Highway VA-625, about 4 miles southeast of Skippers:

Ap—0 to 11 inches; grayish brown (10YR 5/2) loamy sand; massive; very friable; few fine roots; few fine flakes of mica; moderately acid; abrupt smooth boundary.

E—11 to 20 inches; light yellowish brown (10YR 6/4) sandy loam; massive; firm, few fine roots; common fine flakes of mica; slightly acid; gradual smooth boundary.

Bt1—20 to 28 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light yellowish brown (10YR 6/4) mottles in the upper part; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few faint clay films on faces of peds; common fine flakes of mica; strongly acid; diffuse smooth boundary.

Bt2—28 to 48 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; many distinct clay films on faces of peds; common fine flakes of mica; very strongly acid; diffuse smooth boundary.

C—48 to 63 inches; yellowish brown (10YR 5/8) sandy loam; many medium distinct yellowish red (5YR 5/8) mottles; massive; firm, slightly sticky, slightly plastic; common fine flakes of mica; 2 percent gravel; very strongly acid.

The solum thickness ranges from 35 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 2 percent in the solum and 0 to 15 percent in the C horizon. Reaction in unlimed areas is very strongly acid or strongly acid.

Some pedons have an A horizon that has hue of 7.5YR through 2.5Y, value of 3 or 4, and chroma of 2 or 3. It is loamy sand, fine sandy loam, or sandy loam.

The Ap horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 2 through 6. It is loamy sand, fine sandy loam, or sandy loam.

The E horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 3 through 8. It is loamy sand, fine sandy loam, or sandy loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 through 6, and chroma of 4 through 8. It is sandy loam, sandy clay loam, or clay loam. The lower part of the Bt horizon is mottled yellow and red.

The C horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 2 through 8. It generally is mottled brown, red, yellow, olive, and gray. It is sandy loam or fine sandy loam.

Tarboro Series

The soils of the Tarboro series are very deep and somewhat excessively drained. They formed in sandy, unconsolidated, fluvial sediments. They are on flood plains in the Coastal Plain physiographic province. Slopes range from 0 to 2 percent.

The Tarboro soils are near Altavista, Bojac, Roanoke, and Wickham soils but contain more sand in the subsoil than those soils.

Typical profile of Tarboro loamy sand, 0 to 2 percent slopes, frequently flooded, about 0.8 mile northeast of the junction of Highways VA-730 and VA-668 and 1 mile northwest of Haleys Bridge:

Ap—0 to 12 inches; dark brown (10YR 4/3) loamy sand; weak coarse granular structure; very friable; few fine flakes of mica; slightly acid; abrupt wavy boundary.
C1—12 to 22 inches; yellowish brown (10YR 5/6) loamy sand; weak coarse granular structure; very friable; few fine flakes of mica; strongly acid; diffuse smooth boundary.
C2—22 to 32 inches; yellowish brown (10YR 5/6) loamy sand; weak coarse granular structure; very friable; common fine flakes of mica; moderately acid; gradual smooth boundary.
C3—32 to 50 inches; brownish yellow (10YR 6/6) sand; single grain; loose; common fine flakes of mica; slightly acid; diffuse smooth boundary.
C4—50 to 72 inches; brownish yellow (10YR 6/6) sand; single grain; loose; common fine flakes of mica; 2 percent rounded gravel; moderately acid.

The thickness of the sandy material and the depth to bedrock are more than 80 inches. The content of rock fragments ranges from 0 to 5 percent in the soil. Reaction in unlimed areas is strongly acid to slightly acid.

Some pedons have an A horizon that has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 through 4. It is loamy sand or sand.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 2 through 6. It is loamy sand or sand.

The C horizon has hue of 7.5YR or 10YR, value of 4 through 7, and chroma of 3 through 8. It is mottled brown, yellow, and olive in some profiles. It mainly is loamy sand, sand, or coarse sand but is gravelly layers in some profiles.

Uchee Series

The soils of the Uchee series are very deep and well drained. They formed in loamy, unconsolidated, fluvial and marine sediments. They are on uplands in the Coastal Plain physiographic province. Slopes range from 0 to 6 percent.

The Uchee soils are near Craven, Emporia, and Woodington soils but have a thicker surface layer than those soils.

Typical profile of Uchee loamy sand, 0 to 6 percent slopes, about 0.7 mile south-southeast of the junction of Caney Swamp and Highway VA-660 and 135 yards east of Highway VA-660, about 3.1 miles southeast of Skippers (fig. 8):

Oi—3 inches to 0; undecomposed and partially decomposed leaves and twigs.
A—0 to 8 inches; grayish brown (10YR 5/2) loamy sand; massive; very friable; many fine, medium, and coarse roots; very strongly acid; abrupt smooth boundary.
E—8 to 25 inches; light yellowish brown (10YR 6/4) loamy sand; massive; very friable; many fine and medium roots; strongly acid; diffuse smooth boundary.
E/B—25 to 34 inches; light yellowish brown (10YR 6/4) loamy sand; massive; very friable E part; pockets of yellowish brown (10YR 5/8) sandy loam; massive; friable B part; common fine and medium roots; strongly acid; gradual smooth boundary.
Bt1—34 to 40 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; strongly acid; diffuse smooth boundary.
Bt2—40 to 52 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many distinct clay films and bridges on sand grains, few faint clay films on faces of peds; strongly acid; diffuse smooth boundary.
C—52 to 66 inches; strong brown (7.5YR 5/8) sandy clay loam; few fine faint light gray (10YR 7/2) mottles; massive; firm; strongly acid.

The solum thickness ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 15 percent in the solum. Reaction in unlimed areas is very strongly acid or strongly acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. It is sand or loamy sand.

Some pedons have an Ap horizon that has hue of 10YR, value of 4 or 5, and chroma of 2 through 4. It is sand or loamy sand.

The E horizon has hue of 10YR, value of 4 through 6, and chroma of 4 or 6. It is sand or loamy sand.

The E/B horizon has colors and textures similar to those of the the E and Bt horizons.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 through 7, and chroma of 4 through 8. It is sandy loam,

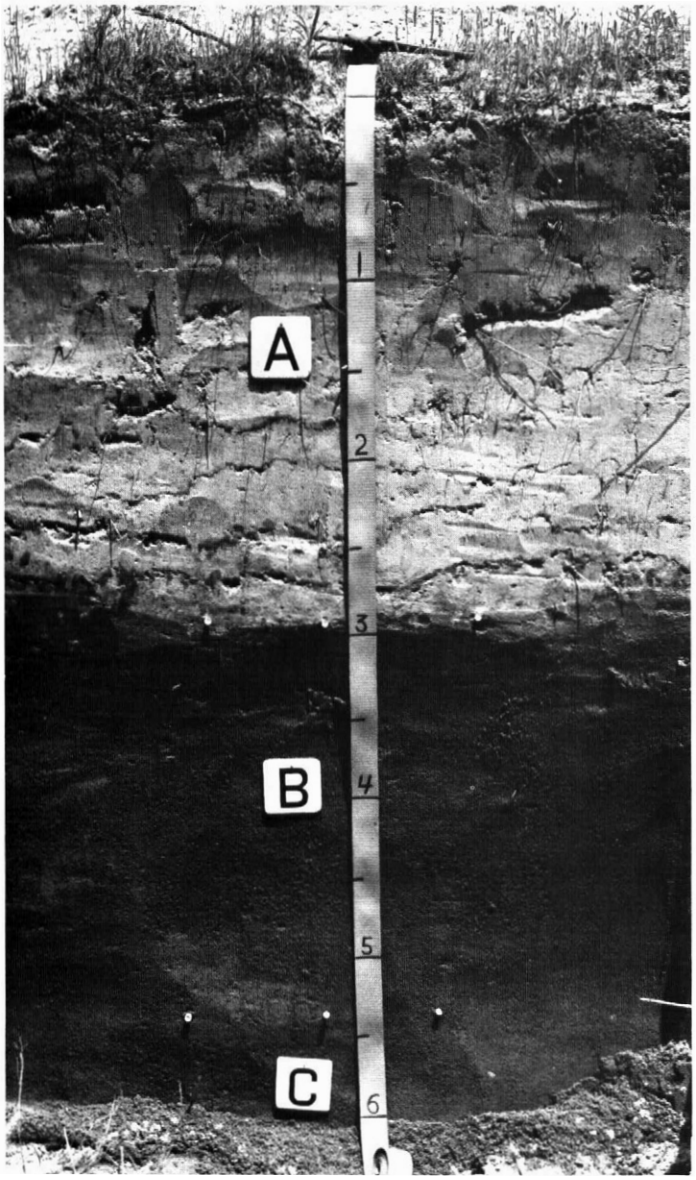

Figure 8.—Typical profile of Uchee loamy sand, 0 to 6 percent slopes. The increments on the marker are in feet.

sandy clay loam, sandy clay, or clay. The lower part of the Bt horizon is mottled red, brown, yellow, and gray.

The C horizon has matrix colors or mottles of red, brown, yellow, and gray. It ranges from sandy loam through clay.

Udorthents

Udorthents in this survey area are shallow to very deep, somewhat poorly drained to well drained soils. They formed in loamy and clayey residuum and in unconsolidated, fluvial and marine sediments. They are on uplands, stream terraces, and flood plains in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 0 to 25 percent.

Udorthents are near Iredell, Louisburg, Mattaponi, and Roanoke soils but do not have diagnostic horizons.

Because of the variability of Udorthents, a typical profile is not given. The depth to bedrock is 10 inches or more. The content of rock fragments ranges from 0 to 75 percent. Reaction ranges from extremely acid to moderately alkaline.

The A horizon has hue of 2.5YR through 2.5Y, value of 4 through 8, and chroma of 3 through 8. It is sandy loam through clay loam in the fine earth fraction.

The upper part of the C horizon has hue of 2.5YR through 2.5Y, value of 3 through 8, and chroma of 3 through 8. The lower part of the C horizon has hue of 2.5YR through 5Y or is neutral. It has value of 3 through 8 and chroma of 0 through 8. The upper part of the C horizon is sandy loam to clay in the fine earth fraction. The lower part of the C horizon is sand to clay in the fine earth fraction.

Wickham Series

The soils of the Wickham series are very deep and well drained. They formed in loamy, unconsolidated, fluvial sediments. They are on stream terraces and flood-plain point bars in the Coastal Plain and Piedmont physiographic provinces. Slopes range from 0 to 3 percent.

The Wickham soils are near Altavista, Chenneby, Peawick, and Tarboro soils. The Wickham soils are better drained than the Altavista, Chenneby, and Peawick soils and contain more clay in the subsoil than the Tarboro soils.

Typical profile of Wickham fine sandy loam, 0 to 3 percent slopes, about 0.9 mile north-northwest of the junction of Highways VA-622 and VA-625 and 350 yards west of Highway VA-622, about 1.3 miles southwest of Bryants Corner:

Ap—0 to 8 inches; pale brown (10YR 6/3) fine sandy loam; massive; friable; many fine roots; few fine flakes of mica; slightly acid; abrupt smooth boundary.

Bt1—8 to 22 inches; yellowish red (5YR 5/8) fine sandy loam; common medium faint strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many fine roots; many distinct clay films on faces of

peds; few fine flakes of mica; moderately acid; gradual smooth boundary.

Bt2—22 to 37 inches; red (2.5YR 4/8) clay loam; many medium faint yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; friable, sticky, plastic; common fine roots; many distinct clay films on faces of peds; few fine flakes of mica; moderately acid; diffuse smooth boundary.

Bt3—37 to 48 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; friable, sticky, plastic; few fine roots; many distinct clay films on faces of peds; many fine flakes of mica; moderately acid; diffuse smooth boundary.

Bt4—48 to 57 inches; red (2.5YR 4/8) clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many distinct clay films on faces of peds; many fine flakes of mica; strongly acid; diffuse smooth boundary.

Bt5—57 to 76 inches; red (2.5YR 4/8) sandy clay; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many distinct clay films and bridges on sand grains; many fine flakes of mica; very strongly acid.

The solum thickness is at least 36 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 35 percent in the C horizon. Reaction in unlimed areas is very strongly acid to moderately acid.

Some pedons have an A horizon that has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 or 3. It is fine sandy loam, sandy loam, loamy sand, or loam.

The Ap horizon has hue of 5YR through 10YR, value 4 through 6, and chroma of 2 through 4. It is fine sandy loam, sandy loam, loamy sand, or loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 through 6, and chroma of 4 through 8. It is sandy clay loam, fine sandy loam, sandy loam, loam, clay loam, sandy clay, or clay.

The C horizon has hue of 5YR through 10YR, value of 5 or 6, and chroma of 3 through 8. It is sand, loamy sand, sandy loam, or sandy clay loam in the fine earth fraction.

Woodington Series

The soils of the Woodington series are very deep and poorly drained. They formed in loamy, unconsolidated, fluvial and marine sediments. They are in depressions and along drainageways in the Coastal Plain physiographic province. Slopes range from 0 to 2 percent.

The Woodington soils are near Craven, Slagle, and Uchee soils but are wetter than those soils.

Typical profile of Woodington fine sandy loam, 0 to 2 percent slopes, about 1.3 miles southwest of the junction of Highways VA-677 and VA-632 and 35 yards south of Highway VA-632:

Oe—2 inches to 0; partially decomposed leaves and twigs.

A—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine medium and coarse roots; strongly acid; clear smooth boundary.

Eg—7 to 17 inches; dark gray (10YR 4/1) fine sandy loam; common medium distinct gray (5Y 6/1) mottles; massive; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

Btg1—17 to 29 inches; olive gray (5Y 5/2) sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; very friable; common fine and medium roots; many distinct clay films and bridges on sand grains, common faint clay films on faces of peds; 1 percent gravel; very strongly acid; diffuse smooth boundary.

Btg2—29 to 43 inches; gray (5Y 5/1) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; very friable; few fine and medium roots; many distinct clay films and bridges on sand grains, common faint clay films on faces of peds; 1 percent gravel; strongly acid; diffuse wavy boundary.

Btg3—43 to 62 inches; gray (N 6/0) sandy loam; many medium distinct strong brown (7.5YR 5/6) and light yellowish brown (2.5Y 6/4) mottles; weak medium subangular blocky structure; very friable; few fine roots; many distinct clay films and bridges on sand grains, many faint clay films on faces of peds; strongly acid; diffuse smooth boundary.

Btg4—62 to 76 inches; gray (N 6/0) sandy loam; many medium distinct strong brown (7.5YR 5/6) and light yellowish brown (2.5Y 6/4) mottles; weak medium subangular blocky structure; very friable; many distinct clay films and bridges on sand grains, many faint clay films on faces of peds; 1 percent gravel; strongly acid.

The solum thickness and the depth to bedrock are more than 60 inches. The content of rock fragments ranges from 0 to 5 percent throughout. Reaction of the

soil in unlimed areas ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR through 5Y or is neutral. It has value of 2 or 3 and chroma of 0 through 2. It is sandy loam, fine sandy loam, loamy sand, or loamy fine sand.

Some pedons have an Ap horizon that has hue of 10YR through 5Y or is neutral. It has value of 2 through 4 and chroma of 0 through 2. It is sandy loam, fine sandy loam, loamy sand, or loamy fine sand.

The Eg horizon has hue of 10YR through 5Y or is neutral. It has value of 4 through 7 and chroma of 0 through 2. It is sandy loam, fine sandy loam, loamy sand, or loamy fine sand.

The Btg horizon has hue of 10YR through 5Y or is neutral. It has value of 5 through 7 and chroma of 0 through 2. It is mottled brown, yellow, and red. It is sandy loam or fine sandy loam.

Formation of the Soils

This section describes the factors and processes that have affected the formation and morphology of the soils in Greensville County.

Factors of Soil Formation

Soil is formed by weathering and other processes that act upon parent materials. The characteristics of the soil at any given point depend upon interaction of the five factors of soil formation. These factors are parent material, climate, plants and animals, relief, and time.

Climate and plants and animals are the active forces of soil formation. In this survey area, they act on material accumulated through the deposition of sediments by fluvial and marine action or on material weathered in place from igneous and metamorphic rocks, and they slowly change these materials into soils. Although all of the five factors affect the formation of every soil, the relative importance of each differs from place to place. In extreme cases one factor may dominate in the formation of a soil and fix most of its properties. Generally, the combined action of the five factors determines the characteristics of each soil.

Parent Material

The unconsolidated mass from which the soil forms is parent material. It is largely responsible for the chemical and mineralogical composition of the soil and the rate at which soil forming processes take place.

The two main parent materials in the survey are (1) unconsolidated sediments deposited by fluvial and marine action and (2) materials weathered in place from igneous and metamorphic rock.

Unconsolidated sediments were deposited during different periods of geologic time and derived from different sources. They combined to give rise to four distinct areas of soils.

The oldest area consists of soils developed in sediments that form overlays on the highest ridges in the western part of the survey area. These soils are highly weathered to a depth of 80 inches or more and have a clay content that remains fairly constant or that increases with depth. The silt and sand fractions are dominantly quartz. The clay fraction consists primarily of kaolinite, hydroxyinterlayered vermiculite, and gibbsite. Plinthitic horizons have formed on the more stable surfaces. Loamy Dothan, Orangeburg, and Uchee soils and clayey Mattaponi soils are examples. Stream dissection in these areas has exposed acid and basic crystalline and metamorphic rock on ridgetops and side slopes. Examples of soils developed in materials weathered from these rocks are clayey Appling and Fluvanna soils.

The second distinct area consists of soils developed in sediments between elevations of 100 and 170 feet above sea level. This area generally is in the northern third of the county. These soils are highly weathered in the upper part of the solum and generally have a clay content that decreases within a depth of 60 inches. The silt and sand fractions are dominantly quartz, but contain some feldspar and mica that increase with depth. The clay fraction consists primarily of kaolinite and hydroxyinterlayered vermiculite with small amounts of gibbsite. Loamy Slagle and Emporia soils are examples of these areas. Areas of soils developed in materials weathered from acid and basic crystalline rocks are exposed only along major streams. Clayey Appling and Fluvanna and loamy Louisburg soils are examples of soils in this area.

The third distinct area consists of soils developed in sediments between elevations of 70 and 100 feet above sea level and is locally known as the "Low Ground." These soils are relatively unweathered and have a clay content that generally decreases within a depth of 60 inches. The sand and silt fractions contain large amounts of feldspar and mica that increase with depth. The clay fraction in well drained areas consists of kaolinite, hydroxyinterlayered vermiculite, and goethite. Moderate amounts of montmorillonite are in moderately well drained to poorly drained areas. Clayey Peawick and Roanoke and loamy Altavista, State, and Wickham

soils are examples of soils in this area.

The fourth distinctive area consists of soils developed in recent alluvial sediments along the Meherrin River and Fontaine Creek. These soils are relatively unweathered. The sand and silt fractions contain large amounts of feldspar and mica. The clay fraction consists of kaolinite, hydroxyinterlayered vermiculite, and goethite and montmorillonite in some areas. Clayey Roanoke soils, loamy Chenneby, Bojac, and Wickham soils, and sandy Tarboro soils are examples of soils in this area.

The materials weathered in place from igneous and metamorphic rock form the parent material for many soils in the western part of the county.

Igneous rock forms by the cooling of molten materials. Slow cooling of these materials produces large crystals of individual minerals, and rapid cooling produces small crystals. Granite is an example of molten materials that have cooled slowly. Grabbo is an example of molten material that has cooled rapidly.

Metamorphic rocks formed from pre-existing rocks that were altered by heat and pressure. Examples of metamorphic rocks are hornblende gneiss and granite gneiss.

Igneous and metamorphic rocks are also classified as acidic and basic. This classification is dependent on the type and amount of minerals present in the rocks. Basic rocks contain calcium, magnesium, and sodium, which are not in acidic rocks.

Soils developed in materials weathered from the acid, coarse-grained granite in the southwest part of the county generally have a gravelly surface layer. These small rock fragments were formed as quartz in the granite by slow cooling and have been subsequently concentrated as the feldspar weathered to clay during soil formation. The clay fraction is dominantly kaolinite and hydroxyinterlayered vermiculite. The clayey Appling and Helena and loamy Louisburg soils are examples of soils formed in these materials.

Soils developed in materials weathered from the basic, fine-grained diorite, diabase, and gabbo in the northwest part of the county generally have a loam surface layer. The clay fraction in well drained soils is dominantly kaolinite and hydroxyinterlayered vermiculite. Large amounts of montmorillonite and carbonates of calcium and sodium have accumulated in areas where ground water seeps from the surrounding uplands. Clayey Fluvanna and Iredell soils are examples of soils in those areas.

Climate

As a genetic factor, climate affects the physical, chemical, and biological relationships in soils, principally through the influence of precipitation and temperature. Water dissolves minerals, supports biological activity, and transports minerals and organic residues through the soil. Temperature determines the type and rate of physical, chemical, and biological activities that take place in the soil.

Because precipitation in the county exceeds evapotranspiration, the soils have been leached. Much of the soluble material that originally was present or was released through weathering has been removed, except in alluvial areas, which are recharged with eroded sediments from surrounding uplands.

Precipitation is the main factor in the formation of the type of subsoil that characterizes most of the soils in the survey area. In addition to leaching soluble materials, water that percolates through the soil moved clay from the surface layer to the subsoil. Except for those soils formed in recent alluvium or sand or on very steep slopes, all the soils in the survey area typically have a subsoil that is more clayey than the surface layer.

Also influenced by climate is the formation of blocky structure in the subsoil of well developed soils. The development of peds (aggregates) in the subsoil is caused partly by changes in volume of the soil mass that are primarily the result of alternate wetting and drying.

Plant and Animal Life

Micro-organisms, vegetation, animals, and man are major factors in the formation of soils. Vegetation is generally responsible for the amount of organic matter, the color of the surface layer, and the amount of plant nutrients. Earthworms, cicada, and other burrowing animals help keep the soil open and porous. Micro-organisms decompose the vegetation and animal matter, thus releasing nutrients for plants. Man changes the soil by mechanically mixing the upper layers.

Before the survey area was settled, the native vegetation was the major living organism affecting soil development. The native vegetation consists mainly of oaks, hickories, maples, and pines. Most hardwoods use a large amount of available calcium and other bases and constantly recycle them through leaf fall and decay. This characteristic of the hardwoods has prevented the soils of the survey area from becoming as leached as would be possible under a coniferous forest cover. Also, because the soils formed under forest vegetation, rapid decay of organic matter and constant recycling of plant nutrients have prevented organic matter from accumulating in large quantities. In

addition, the present climate favors rapid decay of plant materials, oxidation of organic matter, and leaching of plant nutrients.

As farming developed in the area, man became an important factor in development of the soils. The clearing of the forests, cultivation, introduction of new plants, and changes in natural drainage all have had their effect on soil development. The most important changes brought about by man are the mixing of the upper layers of the soil to form a plow layer, the cultivation of steep erodible soils, and the liming and fertilizing that changes the content of plant nutrients, especially in the upper layers of the soils.

Relief

The underlying formations, the geologic history of the general region, and the effects of dissection by rivers and streams largely determine the relief of an area. Relief affects the formation of soils by influencing the rate of surface runoff, the soil temperature, and the geologic erosion. It can alter the effects of climate acting on the parent material to the extent that several different kinds of soil may form from the same kind of parent material. Relief also affects the amount of radiant energy absorbed by the soils, which in turn affects the type of native vegetation.

Relief in the survey area ranges from nearly level to steep. The nearly level soils are commonly on upland flats and on flood plains and terraces of streams. Most of the nearly level soils are wet because of a seasonal high water table, slow surface runoff, or flooding. These soils typically have a subsoil or substratum that is gray or mottled gray and is poorly drained. Roanoke and Woodington soils are examples.

The gently sloping to steep soils generally are well drained or moderately well drained. Geologic erosion is slight, surface runoff is medium to rapid, and translocation of bases and clay has usually occurred downward through the soil. On the steeper soils, however, surface runoff is very rapid, water infiltration and translocation of clay and bases through the soil are reduced, and geologic erosion has removed soil materials.

Where natural stream dissection has not created outlets in upland areas, moderately well drained to poorly drained soils have formed. In most of these areas the parent material and other soil-forming factors are essentially the same and relief, or topography, has modified the effects of the other soil-forming factors. Emporia, Slagle, and Woodington soils are examples of soils in these areas. Emporia soils are well drained and are at the higher portions of the landscape. Woodington soils are poorly drained and are in upland depressions. Slagle soils are moderately well drained and are on the landscape between the Emporia and Woodington soils.

Drainage and texture are related to the depositional environment. Thus, on nearby level fluvial terraces and flood plains, fine grained, poorly drained Roanoke soils have formed in areas where slow-moving water deposited suspended sediments. Coarse grained, somewhat excessively drained Tarboro soils formed where fast-flowing water deposited sand as streams overflowed their banks during flood stage. Medium textured, moderately well drained Altavista soils and well drained Wickham soils formed in material deposited on point bars.

Time

As a factor of soil formation, time generally is related to the degree of development or degree of horizon differentiation within the soil. A soil that has little or no horizon development is considered a young soil, and one that has strongly developed horizons is considered and old, or mature, soil.

The oldest soils in the survey area are those developed in sediments that form cappings on the highest hills in the western part of the survey area. The Dothan and Orangeburg soils are examples. Young soils, such as Chenneby and Riverview soils, formed in recent alluvium. They have been in place only a relatively short time and show little or no horizon development. They are commonly stratified and have an irregular distribution or organic matter in the profile.

Morphology of the Soils

The results of the interaction of the soil-forming factors can be distinguished by the different layers, or horizons, in a soil profile. The soil profile extends from the surface down to materials that are little altered by soil-forming processes.

Most of the soils have three major horizons called A, B, and C horizons. These major horizons may be further subdivided by the use of numbers and letters to indicate changes within one horizon. An example would be the Bt horizon, a B horizon that has an accumulation of clay.

The A horizon is the surface layer and has an accumulation of organic matter. The E horizon is a subsurface layer that has the maximum amount of leaching of bases and eluviation of clay and iron.

The B horizon underlies an A or E horizon and is commonly called the subsoil. It is the horizon of maximum accumulation of clay, iron, aluminum, or other

compounds leached from the surface layer. In some soils the B horizon formed by alteration in place rather than by illuviation. The alteration can be caused by oxidation and reduction of iron or by the weathering of clay minerals. The B horizon commonly has blocky or prismatic structure, and it generally is finer textured and lighter in color than the E horizon but darker than the C horizon.

The C horizon is below the B horizon, or in some instances, below the A horizon. It consists of materials that are little altered by the soil-forming processes.

Processes of Horizon Differentiation

In this survey area several processes are involved in the formation of soil horizons. Among these are the accumulation of organic matter, the leaching of soluble salts, the reduction and transfer of iron, the formation of soil structure, and the formation and translocation of clay minerals. These processes are continually taking place, generally at the same time throughout the soil profile. Such processes have been going on for thousand of years.

The accumulation and incorporation of organic matter takes place with the decomposition of plant residue. Organic matter darkens the surface layer and helps to form the A horizon. In many places much of the surface layer has been eroded away or has been mixed with materials from underlying layers through cultivation. Once lost, organic matter normally takes a long time to replace. In Greensville County, the organic matter content of the surface layer ranges from low in Dothan soils, for example, to medium in Roanoke soils.

For soils to have distinct subsoil horizons, some of the lime and soluble salts must be leached before the translocation of clay minerals. Among the factors that affect this leaching are the kind of salts originally present, the depth to which the soil solution percolates, and the texture of the soil profile.

Well drained to moderately well drained soils in the survey area have a yellowish brown or yellowish red subsoil. These colors are caused mainly by thin coatings of iron oxides on the soil particles, although in some soils the color is inherited from the materials in which they formed. The structure of the subsoil is weak to moderate subangular blocky. The subsoil contains more clay than the overlying surface horizon.

The reduction and transfer of iron, called gleying, is associated mainly with the wetter, more poorly drained soils. Moderately well drained Slagle and Altavista soils have yellowish brown and strong brown mottles which indicate the segregtion of iron. In poorly drained soils, such as Roanoke and Woodington soils, the subsoil and underlying material are grayish, which indicates reduction and transfer of iron by removal in solution.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

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

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on the contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20

inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds just beneath the solum, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

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.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen 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.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax vegetation. 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.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil 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 are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Congeliturbate. Soil material disturbed by frost action.

Conservation tillage. A tillage and planting system in which crop residue covers at least 30 percent of the soil surface after planting. Where soil erosion by wind is the main concern, the system leaves

the equivalent of at least 1,000 pounds per acre of flat small-grain residue on the surface during the critical erosion period.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

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.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

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.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water

from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

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.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

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 the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

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.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine earth fraction. The part of the soil that is less than 2 millimeters.

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone,

slate, shale, or (rarely) schist, 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of Vertisols—clayey soils having a high coefficient of expansion and contraction with changes in moisture content.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

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 up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

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. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

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, any plowed or disturbed surface layer.

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 O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon 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) granular, 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 horizon. 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.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

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.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

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.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and

under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Meander scrolls. A series of parallel, close-fitting, arcuate ridges and troughs formed along the inner bank of a stream meander as the channel migrates laterally down the valley and toward the outer bank.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage. (See Conservation tillage.)

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

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. Mottling generally indicates poor aeration and impeded drainage. 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).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

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 of 10YR hue, value of 6, and chroma of 4.

Narrow-base terrace. A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

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.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial meltwater.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

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.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 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

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting ground ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Point bars. A series of low, arcuate ridges of sand and gravel developed on the inside of a growing meander by the slow addition of individual accretions accompanying migration of the channel toward the outer bank.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

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.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor, on the basis of how much the present

plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in 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—

Extremely acid	below 4.5
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
Mildly 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

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables.) Water that is too salty for consumption by livestock.

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.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. 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.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Sinkhole. A depression in the landscape where limestone has been dissolved.

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 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

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.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are—

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

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 over periods 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 (plural: sola). 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 underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

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 which provide vegetative barriers to wind 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), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *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).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the 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."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

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.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited

geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer of a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Data recorded in the period 1955-81 at Lawrenceville, Va.)

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	48.8	26.0	37.4	73.0	-1.0	88	3.32	4.83	2.00	7	4.3
February	52.4	28.6	40.5	75.0	5.0	115	3.78	5.02	2.40	7	3.6
March	61.4	35.7	48.6	83.0	16.0	283	3.93	5.00	2.55	7	2.9
April	72.4	44.2	58.3	90.0	24.0	546	2.93	3.74	1.99	6	.0
May	78.8	52.6	65.7	93.0	32.0	798	3.97	5.45	2.58	7	.0
June	85.1	60.0	72.6	97.0	41.0	972	4.01	5.40	2.54	6	.0
July	88.6	64.7	76.7	99.0	49.0	1,134	4.38	6.16	2.28	7	.0
August	87.9	64.1	76.0	99.0	48.0	1,116	4.39	5.85	2.20	6	.0
September	81.8	57.3	69.6	94.0	38.0	870	4.03	5.25	1.93	5	.0
October	71.4	45.1	58.3	87.0	24.0	567	3.88	6.40	1.22	5	.0
November	62.6	37.0	49.8	82.0	16.0	312	3.07	5.26	1.53	5	0.1
December	51.6	29.2	40.4	74.0	6.0	126	3.72	4.82	2.55	7	2.5
Yearly:											
Average	70.7	45.8	58.3	---	---	---	---	---	---	---	---
Extreme	---	---	---	103	-6	---	---	---	---	---	---
Total	---	---	---	---	---	6,927	45.41	63.18	25.77	75	13.4

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 2.--TEMPERATURE AND PRECIPITATION

(Data recorded in the period 1955-78 at Boykins, Va.)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- 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	51.3	29.3	40.3	76.0	5.0	114	3.66	4.50	2.86	7	3.4
February	52.8	30.7	41.8	78.0	9.0	135	3.60	4.65	2.72	6	1.6
March	62.8	37.4	50.1	83.0	18.0	315	4.05	5.07	3.29	7	1.6
April	73.3	46.1	59.7	90.0	27.0	572	2.90	3.79	1.79	6	.0
May	79.8	54.3	67.1	93.0	33.0	805	4.19	5.32	2.66	7	.0
June	86.3	62.3	74.3	98.0	43.0	1,005	4.52	6.50	2.61	6	.0
July	89.1	66.7	77.9	99.0	51.0	1,134	5.49	8.95	3.30	8	.0
August	88.9	66.3	77.6	98.0	51.0	1,104	4.74	7.51	2.39	7	.0
September	82.6	59.2	70.9	95.0	40.0	921	4.26	6.13	1.96	6	.0
October	74.4	48.1	61.3	88.0	25.0	594	3.59	5.17	0.93	5	.0
November	64.5	38.7	51.6	84.0	18.0	336	2.98	5.14	1.47	5	0.1
December	52.1	29.2	40.7	76.0	9.0	154	3.75	4.52	2.65	6	1.2
Yearly:											
Average	71.7	48.0	59.9	---	---	---	---	---	---	---	---
Extreme	---	---	---	102	.0	---	---	---	---	---	---
Total	---	---	---	---	---	7,189	47.73	67.25	28.63	76	7.9

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 3.--FREEZE DATES IN SPRING AND FALL

(Data recorded in the period 1955-81 at Lawrenceville, Va.)

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--	Apr. 12	Apr. 21	May 7
2 years in 10 later than--	Mar. 30	Apr. 15	Apr. 28
5 years in 10 later than--	Mar. 20	Apr. 7	Apr. 17
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 30	Oct. 20	Oct. 5
2 years in 10 earlier than--	Nov. 6	Oct. 22	Oct. 15
5 years in 10 earlier than--	Nov. 13	Oct. 31	Oct. 20

TABLE 4.--FREEZE DATES IN SPRING AND FALL

(Data recorded in the period 1955-78 at Boykins, Va.)

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. 23	Apr. 11	May 9
2 years in 10 later than--	Mar. 20	Apr. 10	Apr. 28
5 years in 10 later than--	Mar. 14	Mar. 25	Apr. 13
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 30	Oct. 18	Oct. 6
2 years in 10 earlier than--	Nov. 1	Oct. 19	Oct. 14
5 years in 10 earlier than--	Nov. 17	Oct. 29	Oct. 19

TABLE 5.--GROWING SEASON

(Data recorded in the period 1955-81 at Lawrenceville, Va.)

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	208	191	162
8 years in 10	213	195	172
5 years in 10	233	211	189
2 years in 10	256	219	196
1 year in 10	266	220	198

TABLE 6.--GROWING SEASON

(Data recorded in the period 1955-78 at Boykins, Va.)

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	222	191	164
8 years in 10	226	194	176
5 years in 10	249	220	190
2 years in 10	280	237	194
1 year in 10	281	243	210

TABLE 7.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1B	Abell loam, 2 to 7 percent slopes	2,909	1.5
2A	Altavista fine sandy loam, 0 to 3 percent slopes	4,466	2.3
3A	Altavista fine sandy loam, 0 to 2 percent slopes, frequently flooded	2,789	1.4
4B3	Appling sandy clay loam, 2 to 7 percent slopes, severely eroded	541	0.3
4C3	Appling sandy clay loam, 7 to 15 percent slopes, severely eroded	1,665	0.9
5B	Appling gravelly coarse sandy loam, 2 to 7 percent slopes	2,138	1.1
6B	Appling-Louisburg complex, 2 to 7 percent slopes	680	0.4
6C	Appling-Louisburg complex, 7 to 15 percent slopes	1,458	0.8
7B	Appling-Mattaponi complex, 2 to 7 percent slopes	2,471	1.3
7C	Appling-Mattaponi complex, 7 to 15 percent slopes	1,847	1.0
8A	Bojac loamy fine sand, 0 to 2 percent slopes, frequently flooded	560	0.3
9A	Chenneby silt loam, 0 to 2 percent slopes, frequently flooded	1,259	0.7
10B3	Craven clay loam, 2 to 6 percent slopes, severely eroded	7,827	4.1
10C3	Craven clay loam, 6 to 12 percent slopes, severely eroded	7,392	3.8
11A	Dothan loamy sand, 0 to 2 percent slopes	2,256	1.2
12B	Emporia loamy fine sand, 2 to 6 percent slopes	9,187	4.8
13A	Faceville loamy sand, 0 to 2 percent slopes	355	0.2
14B	Fluvanna loam, 2 to 7 percent slopes	1,527	0.8
15B3	Fluvanna clay loam, 2 to 7 percent slopes, severely eroded	822	0.4
15C3	Fluvanna clay loam, 7 to 15 percent slopes, severely eroded	1,760	0.9
16B3	Fluvanna-Goldston complex, 2 to 7 percent slopes, severely eroded	421	0.2
16C3	Fluvanna-Goldston complex, 7 to 15 percent slopes, severely eroded	1,083	0.6
17B	Fluvanna-Mattaponi complex, 2 to 7 percent slopes	6,409	3.3
17C	Fluvanna-Mattaponi complex, 7 to 15 percent slopes	7,805	4.0
18B	Georgeville loam, 2 to 7 percent slopes	833	0.4
19B3	Georgeville clay loam, 2 to 7 percent slopes, severely eroded	1,578	0.8
19C3	Georgeville clay loam, 7 to 15 percent slopes, severely eroded	1,656	0.9
20B	Helena gravelly coarse sandy loam, 2 to 7 percent slopes	3,932	2.0
21B	Iredell loam, 2 to 7 percent slopes	2,584	1.3
22C3	Iredell clay loam, 7 to 15 percent slopes, severely eroded	778	0.4
23D	Louisburg-Rock outcrop complex, 2 to 25 percent slopes	205	0.1
24B	Mattaponi sandy loam, 2 to 6 percent slopes	10,118	5.2
25B	Mattaponi gravelly sandy loam, 2 to 6 percent slopes	580	0.3
25C	Mattaponi gravelly sandy loam, 6 to 15 percent slopes	236	0.1
26A	Orangeburg loamy sand, 0 to 2 percent slopes	440	0.2
27A	Peawick loam, 0 to 3 percent slopes	6,842	3.5
28B3	Peawick clay loam, 2 to 6 percent slopes, severely eroded	920	0.5
28C3	Peawick clay loam, 6 to 12 percent slopes, severely eroded	1,202	0.6
29	Pits, quarry	160	0.1
30A	Riverview silt loam, 0 to 2 percent slopes, frequently flooded	788	0.4
31A	Roanoke loam, 0 to 2 percent slopes, frequently flooded	28,800	15.0
32A	Roanoke silt loam, 0 to 2 percent slopes, ponded	11,053	5.7
33A	Slagle fine sandy loam, 0 to 3 percent slopes	16,067	8.3
34A	State loamy sand, 0 to 3 percent slopes	1,576	0.8
35A	Tarboro loamy sand, 0 to 2 percent slopes, frequently flooded	1,132	0.6
36B	Uchee loamy sand, 0 to 6 percent slopes	3,892	2.0
37	Udorthents, loamy	1,466	0.8
38A	Wickham fine sandy loam, 0 to 3 percent slopes	699	0.4
39A	Wickham sandy loam, 0 to 2 percent slopes, frequently flooded	1,191	0.6
40A	Woodington fine sandy loam, 0 to 2 percent slopes	23,045	12.0
	Water	1,400	0.7
	Total	192,800	100.0

TABLE 8.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland)

Map symbol	Soil name
1B	Abell loam, 2 to 7 percent slopes
2A	Altavista fine sandy loam, 0 to 3 percent slopes
3A	Altavista fine sandy loam, 0 to 2 percent slopes, frequently flooded
5B	Appling gravelly coarse sandy loam, 2 to 7 percent slopes
7B	Appling-Mattaponi complex, 2 to 7 percent slopes
8A	Bojac loamy fine sand, 0 to 2 percent slopes, frequently flooded
11A	Dothan loamy sand, 0 to 2 percent slopes
12B	Emporia loamy fine sand, 2 to 6 percent slopes
13A	Faceville loamy sand, 0 to 2 percent slopes
14B	Fluvanna loam, 2 to 7 percent slopes
15B3	Fluvanna clay loam, 2 to 7 percent slopes, severely eroded
17B	Fluvanna-Mattaponi complex, 2 to 7 percent slopes
18B	Georgeville loam, 2 to 7 percent slopes
19B3	Georgeville clay loam, 2 to 7 percent slopes, severely eroded
20B	Helena gravelly coarse sandy loam, 2 to 7 percent slopes
24B	Mattaponi sandy loam, 2 to 6 percent slopes
25B	Mattaponi gravelly sandy loam, 2 to 6 percent slopes
26A	Orangeburg loamy sand, 0 to 2 percent slopes
27A	Peawick loam, 0 to 3 percent slopes
28B3	Peawick clay loam, 2 to 6 percent slopes, severely eroded
30A	Riverview silt loam, 0 to 2 percent slopes, frequently flooded
33A	Slagle fine sandy loam, 0 to 3 percent slopes
34A	State loamy sand, 0 to 3 percent slopes
38A	Wickham fine sandy loam, 0 to 3 percent slopes
39A	Wickham sandy loam, 0 to 2 percent slopes, frequently flooded

TABLE 9.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Peanuts	Corn	Tobacco	Soybeans	Wheat	Cotton lint	Pasture
		Lbs	Bu	Lbs	Bu	Bu	Lbs	AUM*
1B---------- Abell	IIe	2,400	110	2,100	35	50	---	8.0
2A, 3A---------- Altavista	IIw	3,000	120	2,600	45	55	550	9.0
4B3---------- Appling	IIIe	---	75	2,200	30	40	550	6.5
4C3---------- Appling	IVe	---	60	1,800	25	35	450	6.0
5B---------- Appling	IIs	1,800	90	2,400	35	45	650	8.0
6B---------- Appling-Louisburg	IVs	1,500	---	1,800	28	35	---	6.0
6C---------- Appling-Louisburg	VIe	---	---	---	---	---	---	5.0
7B---------- Appling-Mattaponi	IIe	2,200	92	2,400	33	45	---	7.1
7C---------- Appling-Mattaponi	IIIe	2,000	78	2,000	28	40	---	6.4
8A---------- Bojac	IIw	3,700	90	---	30	45	---	6.5
9A---------- Chenneby	IVw	---	---	---	---	---	---	9.0
10B3, 10C3------ Craven	VIe	---	---	---	---	---	---	5.5
11A---------- Dothan	I	3,800	120	2,800	40	50	900	7.0
12B---------- Emporia	IIe	3,700	100	2,900	30	50	600	7.5
13A---------- Faceville	I	4,000	115	2,800	45	55	875	---
14B---------- Fluvanna	IIe	3,000	110	2,200	35	50	---	8.0
15B3---------- Fluvanna	IIIe	2,400	90	1,800	30	30	---	7.0
15C3---------- Fluvanna	IVe	---	80	---	25	25	---	6.0

See footnote at end of table.

TABLE 9.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Peanuts	Corn	Tobacco	Soybeans	Wheat	Cotton lint	Pasture
		Lbs	Bu	Lbs	Bu	Bu	Lbs	AUM*
16B3--- Fluvanna-Goldston	IVs	---	82	---	26	32	---	6.0
16C3--- Fluvanna-Goldston	IVs	---	---	---	---	---	---	5.4
17B--- Fluvanna-Mattaponi	IIe	3,000	104	2,200	33	48	---	7.1
17C--- Fluvanna-Mattaponi	IIIe	2,400	89	1,800	28	40	---	6.7
18B--- Georgeville	IIe	2,500	95	2,200	35	55	700	7.5
19B3--- Georgeville	IIIe	2,000	75	1,600	25	35	525	6.5
19C3--- Georgeville	IVe	---	60	---	20	30	450	6.0
20B--- Helena	IIe	1,800	80	2,100	25	40	575	5.8
21B--- Iredell	IIIe	---	55	---	20	30	700	6.0
22C3--- Iredell	VIe	---	---	---	---	---	---	5.0
23D**--- Louisburg-Rock outcrop	VIIs	---	---	---	---	---	---	3.0
24B--- Mattaponi	IIe	3,000	95	2,200	30	45	---	6.0
25B--- Mattaponi	IIe	2,500	80	2,000	25	45	---	5.5
25C--- Mattaponi	IIIe	2,000	70	1,800	25	35	---	5.0
26A--- Orangeburg	I	4,000	120	2,400	45	---	900	7.5
27A--- Peawick	IIw	2,000	90	1,200	28	30	---	---
28B3--- Peawick	IIIe	1,400	50	1,000	20	25	---	5.0
28C3--- Peawick	IVe	---	---	---	---	---	---	5.0
29. Pits, quarry								

See footnote at end of table.

TABLE 9.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Peanuts	Corn	Tobacco	Soybeans	Wheat	Cotton lint	Pasture
		Lbs	Bu	Lbs	Bu	Bu	Lbs	AUM*
30A---------- Riverview	IVw	2,700	120	---	30	50	---	9.5
31A---------- Roanoke	Vw	---	---	---	---	---	---	5.2
32A---------- Roanoke	VIIw	---	---	---	---	---	---	---
33A---------- Slagle	IIw	3,500	125	3,000	40	45	---	9.0
34A---------- State	I	3,300	130	3,000	45	60	---	9.0
35A---------- Tarboro	IIIs	2,000	65	---	20	30	---	6.0
36B---------- Uchee	IIs	3,000	70	2,000	30	35	550	6.0
37. Udorthents								
38A---------- Wickham	I	3,400	120	2,800	45	55	800	9.5
39A---------- Wickham	IIw	3,400	120	---	45	55	800	9.5
40A---------- Woodington	IIIw	---	100	---	35	---	---	9.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 10.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
1B---------- Abell	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	90	9	Loblolly pine, yellow poplar, black walnut.
						Northern red oak----	80	4	
						Yellow poplar-------	90	6	
						Shortleaf pine------	80	9	
						Virginia pine-------	80	8	
2A, 3A---------- Altavista	9W	Slight	Moderate	Slight	Slight	Loblolly pine-------	91	9	Loblolly pine, yellow poplar, black walnut, sweetgum, American sycamore, cherrybark oak.
						Longleaf pine-------	84	8	
						Shortleaf pine------	---	---	
						Sweetgum------------	---	---	
						White oak-----------	---	---	
						Red maple-----------	---	---	
						Yellow poplar-------	---	---	
						Southern red oak----	---	---	
						Northern red oak----	---	---	
						Water oak-----------	---	---	
4B3, 4C3, 5B---- Appling	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	81	8	Loblolly pine, yellow poplar, slash pine.
						Shortleaf pine------	65	7	
						Virginia pine-------	74	8	
						Southern red oak----	---	---	
						White oak-----------	90	6	
						Yellow poplar-------	---	---	
						Sweetgum------------	---	---	
						Hickory-------------	---	---	
6B**, 6C**: Appling--------	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	81	8	Loblolly pine, yellow poplar, slash pine.
						Shortleaf pine------	65	7	
						Virginia pine-------	74	8	
						Southern red oak----	---	---	
						White oak-----------	90	6	
						Yellow poplar-------	---	---	
						Sweetgum------------	---	---	
						Hickory-------------	---	---	
Louisburg------	7A	Slight	Slight	Slight	Slight	Loblolly pine-------	77	7	Loblolly pine, slash pine, Virginia pine, yellow poplar.
						Shortleaf pine------	69	8	
						Southern red oak----	72	4	
						Yellow poplar-------	84	6	
						Virginia pine-------	71	8	
						White oak-----------	68	4	
7B**, 7C**: Appling--------	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	81	8	Loblolly pine, yellow poplar, slash pine.
						Shortleaf pine------	65	7	
						Virginia pine-------	74	8	
						Southern red oak----	---	---	
						White oak-----------	90	6	
						Yellow poplar-------	---	---	
						Sweetgum------------	---	---	
						Hickory-------------	---	---	
Mattaponi------	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	80	8	Loblolly pine, shortleaf pine.
						White oak-----------	70	4	
						Virginia pine-------	70	8	
						Sweetgum------------	76	5	

See footnotes at end of table.

TABLE 10.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
8A Bojac	3S	Slight	Slight	Moderate	Slight	Southern red oak Loblolly pine Sweetgum	65 80 80	3 8 6	Loblolly pine, sweetgum.
9A Chenneby	9W	Slight	Moderate	Moderate	Slight	Loblolly pine Sweetgum Water oak Yellow poplar American sycamore	100 100 100 110 110	9 10 7 9 11	Loblolly pine, yellow poplar, sweetgum, water oak, American sycamore.
10B3, 10C3 Craven	8W	Slight	Moderate	Slight	Slight	Loblolly pine Longleaf pine Water oak Sweetgum White oak Southern red oak Red maple Blackgum Yellow poplar	81 67 --- --- --- --- --- --- ---	8 5 --- --- --- --- --- --- ---	Loblolly pine, slash pine.
11A Dothan	12A	Slight	Slight	Slight	Slight	Slash pine Longleaf pine Loblolly pine	92 84 88	12 8 9	Slash pine, loblolly pine, longleaf pine.
12B Emporia	7S	Slight	Slight	Moderate	Slight	Loblolly pine Southern red oak	75 70	7 4	Loblolly pine, sweetgum.
13A Faceville	8A	Slight	Slight	Slight	Slight	Loblolly pine Slash pine Longleaf pine	82 80 65	8 10 5	Loblolly pine, slash pine.
14B, 15B3, 15C3 Fluvanna	8A	Slight	Slight	Slight	Slight	Virginia pine Shortleaf pine Northern red oak	74 63 70	8 7 4	Loblolly pine, Virginia pine.
16B3**, 16C3**: Fluvanna	8A	Slight	Slight	Slight	Slight	Virginia pine Shortleaf pine Northern red oak	74 63 70	8 7 4	Loblolly pine, Virginia pine.
Goldston	7D	Slight	Slight	Moderate	Severe	Loblolly pine Shortleaf pine Southern red oak White oak Longleaf pine Post oak Hickory	73 63 63 63 --- --- ---	7 7 3 3 --- --- ---	Loblolly pine.
17B**, 17C**: Fluvanna	8A	Slight	Slight	Slight	Slight	Virginia pine Shortleaf pine Northern red oak	74 63 70	8 7 4	Loblolly pine, Virginia pine.
Mattaponi	8A	Slight	Slight	Slight	Slight	Loblolly pine White oak Virginia pine Sweetgum	80 70 70 76	8 4 8 5	Loblolly pine, shortleaf pine.

See footnotes at end of table.

TABLE 10.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
18B---------- Georgeville	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	81	8	Loblolly pine, Virginia pine, eastern redcedar, black walnut, yellow poplar.
						Longleaf pine-------	67	5	
						Shortleaf pine------	63	7	
						White oak----------	69	4	
						Scarlet oak---------	70	4	
						Southern red oak----	67	3	
19B3, 19C3------ Georgeville	6C	Moderate	Moderate	Moderate	Slight	Loblolly pine-------	70	6	Loblolly pine, Virginia pine.
						Longleaf pine-------	60	4	
20B---------- Helena	8W	Slight	Moderate	Slight	Slight	Loblolly pine-------	80	8	Loblolly pine, yellow poplar.
						Shortleaf pine------	63	7	
						White oak----------	---	---	
						Yellow poplar-------	---	---	
						Northern red oak----	---	---	
						Southern red oak----	---	---	
						Black oak----------	---	---	
						Hickory------------	---	---	
						Sweetgum-----------	---	---	
						Virginia pine-------	---	---	
						Willow oak---------	---	---	
						American elm--------	---	---	
21B, 22C3------- Iredell	6C	Slight	Moderate	Moderate	Slight	Loblolly pine-------	67	6	Loblolly pine, eastern redcedar.
						Shortleaf pine------	58	6	
						Post oak-----------	44	2	
						White oak----------	47	2	
23D**: Louisburg------	7R	Moderate	Moderate	Slight	Slight	Loblolly pine-------	77	7	Loblolly pine, slash pine, Virginia pine, yellow poplar.
						Shortleaf pine------	69	8	
						Southern red oak----	72	4	
						Yellow poplar-------	84	6	
						Virginia pine-------	71	8	
						White oak----------	68	4	
Rock outcrop.									
24B---------- Mattaponi	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	80	8	Loblolly pine, shortleaf pine.
						White oak----------	70	4	
						Virginia pine-------	70	8	
						Sweetgum-----------	76	5	
25B, 25C-------- Mattaponi	3A	Slight	Slight	Slight	Slight	White oak----------	66	3	Loblolly pine, shortleaf pine.
						Loblolly pine-------	76	7	
						Virginia pine-------	66	7	
						Sweetgum-----------	76	5	
26A---------- Orangeburg	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	80	8	Slash pine, loblolly pine.
						Slash pine----------	86	11	
						Longleaf pine-------	77	7	
27A, 28B3------- Peawick	7W	Slight	Moderate	Slight	Slight	Loblolly pine-------	77	7	Loblolly pine.
						Sweetgum-----------	---	---	
						Yellow poplar-------	---	---	
						Water oak----------	---	---	
						White oak----------	---	---	

See footnotes at end of table.

TABLE 10.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
28C3---------- Peawick	7R	Slight	Moderate	Slight	Slight	Loblolly pine-------	77	7	Loblolly pine.
						Sweetgum----------	---	---	
						Yellow poplar-------	---	---	
						Water oak----------	---	---	
						White oak----------	---	---	
30A---------- Riverview	11W	Slight	Moderate	Moderate	Slight	Loblolly pine-------	100	11	Loblolly pine, slash pine, eastern cottonwood, sweetgum, yellow poplar, American sycamore.
						Yellow poplar-------	110	9	
						Sweetgum----------	100	10	
31A---------- Roanoke	7W	Slight	Severe	Severe	Slight	Sweetgum----------	90	7	Sweetgum.
						Willow oak----------	76	4	
						White oak----------	75	4	
32A---------- Roanoke	8W	Slight	Severe	Severe	Slight	Sweetgum----------	94	8	Water tupelo.
						Baldcypress---------	---	---	
						Blackgum----------	---	---	
						Water tupelo--------	---	---	
33A---------- Slagle	9W	Slight	Moderate	Slight	Slight	Loblolly pine-------	86	9	Loblolly pine, sweetgum, yellow poplar.
						Sweetgum----------	86	7	
						Southern red oak----	76	4	
						Water oak----------	76	5	
						Yellow poplar-------	90	6	
34A---------- State	10A	Slight	Slight	Slight	Slight	Loblolly pine-------	95	10	Black walnut, yellow poplar, loblolly pine.
						Southern red oak----	85	5	
						Yellow poplar-------	100	8	
						Virginia pine-------	85	9	
35A---------- Tarboro	7S	Slight	Moderate	Moderate	Slight	Loblolly pine-------	71	7	Loblolly pine, slash pine.
						Longleaf pine-------	---	---	
						Slash pine----------	---	---	
36B---------- Uchee	8S	Slight	Moderate	Moderate	Slight	Loblolly pine-------	82	8	Loblolly pine, longleaf pine, slash pine.
						Longleaf pine-------	67	5	
						Shortleaf pine------	---	---	
38A---------- Wickham	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	90	9	Loblolly pine.
						Slash pine----------	---	---	
						Northern red oak----	89	5	
39A---------- Wickham	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	90	9	Loblolly pine, slash pine, yellow poplar.
						Slash pine----------	90	11	
						Yellow poplar-------	100	8	
						Southern red oak----	---	---	
40A---------- Woodington	3W	Slight	Severe	Severe	Moderate	Slash pine----------	---	---	Slash pine, loblolly pine, American sycamore, water tupelo, water oak, sweetgum.
						Loblolly pine-------	83	8	
						Sweetgum----------	---	---	
						White oak----------	---	---	
						Southern red oak----	---	---	
						Water tupelo--------	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1B Abell	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones, wetness.	Slight	Slight.
2A Altavista	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
3A Altavista	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
4B3 Appling	Slight	Slight	Moderate: slope.	Slight	Slight.
4C3 Appling	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
5B Appling	Moderate: small stones.	Severe: small stones.	Severe: small stones.	Slight	Moderate: small stones, large stones.
6B*: Appling	Moderate: small stones.	Severe: small stones.	Severe: small stones.	Slight	Moderate: small stones, large stones.
Louisburg	Moderate: small stones.	Slight	Severe: small stones.	Slight	Moderate: small stones, droughty.
6C*: Appling	Moderate: small stones, slope.	Severe: small stones.	Severe: small stones, slope.	Slight	Moderate: small stones, large stones, slope.
Louisburg	Moderate: slope, small stones.	Moderate: slope.	Severe: slope, small stones.	Slight	Moderate: small stones, slope, droughty.
7B*: Appling	Moderate: small stones.	Severe: small stones.	Severe: small stones.	Slight	Moderate: small stones, large stones.
Mattaponi	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
7C*: Appling	Moderate: small stones, slope.	Severe: small stones.	Severe: small stones, slope.	Slight	Moderate: small stones, large stones, slope.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
7C*: Mattaponi	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
8A Bojac	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
9A Chenneby	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Severe: erodes easily.	Severe: flooding.
10B3 Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Slight.
10C3 Craven	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
11A Dothan	Slight	Slight	Slight	Slight	Moderate: droughty.
12B Emporia	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Moderate: droughty.
13A Faceville	Slight	Slight	Slight	Slight	Slight.
14B, 15B3 Fluvanna	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
15C3 Fluvanna	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
16B3*: Fluvanna	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
Goldston	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, depth to rock.	Slight	Severe: depth to rock.
16C3*: Fluvanna	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Goldston	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: depth to rock.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
17B*:					
Fluvanna	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
Mattaponi	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
17C*:					
Fluvanna	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Mattaponi	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
18B--- Georgeville	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.	Slight.
19B3--- Georgeville	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
19C3--- Georgeville	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
20B--- Helena	Moderate: small stones, wetness, percs slowly.	Moderate: wetness, small stones.	Severe: small stones.	Moderate: wetness.	Moderate: small stones, wetness.
21B, 22C3--- Iredell	Severe: wetness.	Moderate: slope, wetness.	Severe: slope, wetness.	Moderate: wetness.	Moderate: wetness, slope.
23D*:					
Louisburg	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Rock outcrop	Severe: slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
24B--- Mattaponi	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
25B--- Mattaponi	Severe: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Severe: small stones.
25C--- Mattaponi	Severe: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight	Severe: small stones.
26A--- Orangeburg	Slight	Slight	Slight	Slight	Slight.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
27A, 28B3---------- Peawick	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Moderate: wetness.	Moderate: wetness.
28C3---------- Peawick	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: wetness, slope.
29. Pits, quarry					
30A---------- Riverview	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
31A---------- Roanoke	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: flooding, wetness.
32A---------- Roanoke	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding, erodes easily.	Severe: ponding, flooding.
33A---------- Slagle	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
34A---------- State	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
35A---------- Tarboro	Severe: flooding.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy, flooding.	Severe: flooding.
36B---------- Uchee	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.	Moderate: droughty.
37. Udorthents					
38A---------- Wickham	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
39A---------- Wickham	Severe: flooding.	Moderate--------	Severe: flooding.	Moderate: flooding.	Severe: flooding.
40A---------- Woodington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1B---------- Abell	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
2A, 3A---------- Altavista	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
4B3---------- Appling	Fair	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
4C3---------- Appling	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
5B---------- Appling	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
6B*: Appling----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Louisburg---------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
6C*: Appling----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Louisburg---------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
7B*: Appling----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Mattaponi---------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
7C*: Appling----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Mattaponi---------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
8A---------- Bojac	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
9A---------- Chenneby	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
10B3, 10C3--------- Craven	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
11A---------- Dothan	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 12.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
12B---------- Emporia	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
13A---------- Faceville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
14B---------- Fluvanna	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
15B3---------- Fluvanna	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
15C3---------- Fluvanna	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
16B3*:										
Fluvanna----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Goldston----------	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
16C3*:										
Fluvanna----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Goldston----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
17B*:										
Fluvanna----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Mattaponi---------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
17C*:										
Fluvanna----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Mattaponi---------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
18B---------- Georgeville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
19B3---------- Georgeville	Fair	Fair	Fair	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.
19C3---------- Georgeville	Poor	Poor	Poor	Fair	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
20B---------- Helena	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
21B, 22C3---------- Iredell	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 12.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
23D*: Louisburg	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
24B Mattaponi	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
25B Mattaponi	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
25C Mattaponi	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
26A Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
27A, 28B3 Peawick	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
28C3 Peawick	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
29. Pits, quarry										
30A Riverview	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor.
31A Roanoke	Poor	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
32A Roanoke	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
33A Slagle	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
34A State	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
35A Tarboro	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
36B Uchee	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
37. Udorthents										
38A, 39A Wickham	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
40A Woodington	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1B---------- Abell	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.	Slight.
2A---------- Altavista	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, low strength.	Moderate: wetness.
3A---------- Altavista	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.
4B3---------- Appling	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
4C3---------- Appling	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.	Moderate: slope.
5B---------- Appling	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Moderate: small stones, large stones.
6B*: Appling----------	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Moderate: small stones, large stones.
Louisburg--------	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Slight---------	Moderate: small stones, droughty.
6C*: Appling----------	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.	Moderate: small stones, large stones, slope.
Louisburg--------	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, slope, droughty.
7B*: Appling----------	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Moderate: small stones, large stones.
Mattaponi--------	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
7C*:						
Appling	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.	Moderate: small stones, large stones, slope.
Mattaponi	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
8A Bojac	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
9A Chenneby	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding.	Severe: flooding.
10B3 Craven	Severe: wetness, cutbanks cave.	Moderate: shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Slight.
10C3 Craven	Severe: wetness, cutbanks cave.	Moderate: shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
11A Dothan	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
12B Emporia	Moderate: wetness.	Slight	Moderate: wetness, shrink-swell.	Moderate: slope.	Moderate: low strength.	Moderate: droughty.
13A Faceville	Moderate: too clayey.	Slight	Slight	Slight	Moderate: low strength.	Slight.
14B, 15B3 Fluvanna	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
15C3 Fluvanna	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
16B3*:						
Fluvanna	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Goldston	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Severe: depth to rock.
16C3*:						
Fluvanna	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
16C3*: Goldston	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Severe: depth to rock.
17B*: Fluvanna	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Mattaponi	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
17C*: Fluvanna	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Mattaponi	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
18B, 19B3 Georgeville	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
19C3 Georgeville	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
20B Helena	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: small stones, wetness.
21B, 22C3 Iredell	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: wetness, slope.
23D*: Louisburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
24B Mattaponi	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
25B Mattaponi	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Severe: small stones.
25C Mattaponi	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, shrink-swell, slope.	Severe: slope.	Severe: low strength.	Severe: small stones.

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
26A---------- Orangeburg	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
27A, 28B3--------- Peawick	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
28C3---------- Peawick	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: wetness, slope.
29. Pits, quarry						
30A---------- Riverview	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
31A---------- Roanoke	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: flooding, wetness.
32A---------- Roanoke	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
33A---------- Slagle	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: low strength, wetness.	Moderate: wetness.
34A---------- State	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Moderate: low strength.	Slight.
35A---------- Tarboro	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
36B---------- Uchee	Severe: cutbanks cave.	Slight---------	Moderate: wetness, shrink-swell.	Slight---------	Slight---------	Moderate: droughty.
37. Udorthents						
38A---------- Wickham	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
39A---------- Wickham	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
40A---------- Woodington	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1B Abell	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: small stones, wetness.
2A Altavista	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness, too clayey.
3A Altavista	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness, too clayey.
4B3 Appling	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
4C3 Appling	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
5B Appling	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
6B*: Appling	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
Louisburg	Moderate: depth to rock.	Severe: seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer.
6C*: Appling	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
Louisburg	Moderate: depth to rock, slope.	Severe: seepage, slope.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer.
7B*: Appling	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
Mattaponi	Severe: wetness, percs slowly.	Severe: wetness.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
7C*:					
Appling	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
Mattaponi	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
8A Bojac	Severe: flooding.	Severe: flooding, seepage.	Severe: flooding, wetness, seepage.	Severe: flooding, seepage.	Fair: thin layer.
9A Chenneby	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
10B3 Craven	Severe: wetness, percs slowly.	Moderate: slope, seepage.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
10C3 Craven	Severe: wetness, percs slowly.	Severe: slope.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
11A Dothan	Severe: wetness, percs slowly.	Moderate: seepage.	Moderate: wetness.	Slight	Good.
12B Emporia	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Moderate: wetness, too clayey.	Slight	Fair: too clayey, wetness.
13A Faceville	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
14B, 15B3 Fluvanna	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
15C3 Fluvanna	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
16B3*:					
Fluvanna	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Goldston	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, small stones.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
16C3*:					
Fluvanna	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Goldston	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, small stones.
17B*:					
Fluvanna	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Mattaponi	Severe: wetness, percs slowly.	Severe: wetness.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
17C*:					
Fluvanna	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Mattaponi	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
18B, 19B3 Georgeville	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
19C3 Georgeville	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
20B Helena	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
21B, 22C3 Iredell	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
23D*:					
Louisburg	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: slope, thin layer.
Rock outcrop	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
24B Mattaponi	Severe: wetness, percs slowly.	Severe: wetness.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
25B---------- Mattaponi	Severe: wetness, percs slowly.	Severe: wetness.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack, small stones.
25C---------- Mattaponi	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack, small stones.
26A---------- Orangeburg	Slight----------	Moderate: seepage.	Slight----------	Slight----------	Good.
27A, 28B3---------- Peawick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
28C3---------- Peawick	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
29. Pits, quarry					
30A---------- Riverview	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness.
31A---------- Roanoke	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
32A---------- Roanoke	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
33A---------- Slagle	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
34A---------- State	Moderate: wetness, percs slowly.	Severe: seepage.	Severe: seepage, wetness.	Moderate: wetness.	Fair: too clayey, thin layer.
35A---------- Tarboro	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: seepage.
36B---------- Uchee	Severe: wetness, percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
37. Udorthents					
38A---------- Wickham	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
39A---------- Wickham	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: thin layer.
40A---------- Woodington	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1B Abell	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
2A, 3A Altavista	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
4B3, 4C3 Appling	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
5B Appling	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
6B*, 6C*: Appling	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
Louisburg	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
7B*, 7C*: Appling	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
Mattaponi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
8A Bojac	Good	Probable	Probable	Fair: too sandy, area reclaim.
9A Chenneby	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
10B3, 10C3 Craven	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
11A Dothan	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, thin layer.
12B Emporia	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
13A Faceville	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
14B, 15B3, 15C3 Fluvanna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
16B3*, 16C3*:				
Fluvanna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Goldston	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, large stones, small stones.
17B*, 17C*:				
Fluvanna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Mattaponi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
18B, 19B3, 19C3 Georgeville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
20B Helena	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
21B, 22C3 Iredell	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
23D*:				
Louisburg	Poor: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rock outcrop	Poor: depth to rock, slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: depth to rock, slope.
25B Mattaponi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
25B, 25C Mattaponi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
26A Orangeburg	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
27A, 28B3, 28C3 Peawick	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
29. Pits, quarry				
30A Riverview	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
31A, 32A Roanoke	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
33A---------- Slagle	Fair: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
34A---------- State	Good----------	Probable----------	Improbable: too sandy.	Fair: too clayey.
35A---------- Tarboro	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy.
36B---------- Uchee	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
37. Udorthents				
38A---------- Wickham	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
39A---------- Wickham	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Good.
40A---------- Woodington	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
1B---------- Abell	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Slope----------	Wetness, slope.	Favorable.
2A---------- Altavista	Moderate: seepage.	Severe: piping, wetness.	Moderate: deep to water, slow refill.	Favorable------	Wetness--------	Favorable.
3A---------- Altavista	Moderate: seepage.	Severe: piping, wetness.	Moderate: deep to water, slow refill.	Flooding-------	Wetness--------	Favorable.
4B3---------- Appling	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Favorable.
4C3---------- Appling	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope.
5B---------- Appling	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Favorable.
6B*:						
Appling----------	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Favorable.
Louisburg--------	Severe: seepage.	Severe: thin layer.	Severe: no water.	Deep to water	Droughty, slope.	Droughty.
6C*:						
Appling----------	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope.
Louisburg--------	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Droughty, slope.	Slope, droughty.
7B*:						
Appling----------	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Favorable.
Mattaponi--------	Moderate: slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Slope----------	Favorable.
7C*:						
Appling----------	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope.
Mattaponi--------	Severe: slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
8A---------- Bojac	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Droughty.
9A---------- Chenneby	Moderate: seepage.	Severe: piping, hard to pack, wetness.	Moderate: slow refill.	Flooding-------	Wetness, erodes easily, flooding.	Wetness, erodes easily.
10B3---------- Craven	Moderate: seepage, slope.	Severe: hard to pack.	Severe: slow refill, cutbanks cave.	Percs slowly, slope.	Wetness, percs slowly, slope.	Percs slowly.
10C3---------- Craven	Severe: slope.	Severe: hard to pack.	Severe: slow refill, cutbanks cave.	Percs slowly, slope.	Wetness, percs slowly, slope.	Slope, percs slowly.
11A---------- Dothan	Moderate: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Fast intake, droughty.	Droughty.
12B---------- Emporia	Moderate: seepage, slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Fast intake, soil blowing, slope.	Droughty, percs slowly.
13A---------- Faceville	Moderate: seepage.	Slight---------	Severe: no water.	Deep to water	Fast intake----	Favorable.
14B, 15B3--------- Fluvanna	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.
15C3---------- Fluvanna	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.
16B3*: Fluvanna---------	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.
Goldston---------	Severe: depth to rock.	Severe: depth to rock, large stones.	Severe: thin layer, piping, large stones.	Deep to water	Slope, large stones, depth to rock.	Large stones, droughty, depth to rock.
16C3*: Fluvanna---------	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.
Goldston---------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: thin layer, piping, large stones.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
17B*: Fluvanna---------	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
17B*: Mattaponi	Moderate: slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Slope	Favorable.
17C*: Fluvanna	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.
Mattaponi	Severe: slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Slope	Slope.
18B, 19B3 Georgeville	Moderate: slope, seepage.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily.
19C3 Georgeville	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
20B Helena	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Slope, percs slowly.	Percs slowly.
21B, 22C3 Iredell	Severe: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Slope, wetness.	Wetness, slope, percs slowly.
23D*: Louisburg	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Droughty, slope.	Slope, droughty.
Rock outcrop	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
24B Mattaponi	Moderate: slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Slope	Favorable.
25B Mattaponi	Moderate: slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Droughty, slope.	Droughty.
25C Mattaponi	Severe: slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Droughty, slope.	Slope, droughty.
26A Orangeburg	Moderate: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Fast intake	Favorable.
27A Peawick	Slight	Severe: hard to pack.	Severe: no water.	Percs slowly	Wetness, percs slowly, erodes easily.	Percs slowly.
28B3 Peawick	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly, slope.	Percs slowly.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
28C3--- Peawick	Severe: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly, slope.	Slope, percs slowly.
29. Pits, quarry						
30A--- Riverview	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Flooding---	Favorable.
31A--- Roanoke	Moderate: seepage.	Severe: wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Wetness, percs slowly.
32A--- Roanoke	Moderate: seepage.	Severe: ponding.	Severe: slow refill.	Ponding, percs slowly, flooding.	Ponding, percs slowly, erodes easily.	Wetness, erodes easily, percs slowly.
33A--- Slagle	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: no water.	Percs slowly---	Wetness---	Percs slowly.
34A--- State	Severe: seepage.	Moderate: thin layer, piping.	Severe: cutbanks cave.	Deep to water	Fast intake, soil blowing.	Favorable.
35A--- Tarboro	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Droughty.
36B--- Uchee	Moderate: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Droughty.
37. Udorthents						
38A--- Wickham	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable---	Favorable.
39A--- Wickham	Moderate: seepage.	Moderate: thin layer.	Severe: no water.	Deep to water	Flooding---	Favorable.
40A--- Woodington	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness---	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1B---------- Abell	0-9	Loam----------	ML, CL-ML	A-4	0	90-100	85-100	80-95	55-80	<25	NP-7
	9-14	Sandy clay loam, clay loam, sandy loam.	CL, CL-ML, ML, SC	A-2, A-4, A-6	0	90-100	75-100	50-95	25-85	<40	NP-20
	14-40	Clay, clay loam, silty clay loam.	CL, CH	A-6, A-7	0-5	90-100	75-95	70-95	65-90	30-60	15-30
	40-65	Loam, sandy loam, silt loam.	SM, ML	A-2, A-4	0-5	75-100	75-100	60-95	30-85	<30	NP-7
2A---------- Altavista	0-10	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	10-50	Clay loam, sandy clay loam, loam.	CL, CL-ML, SC, SM-SC	A-4, A-6, A-7	0	95-100	95-100	60-99	45-75	20-45	5-28
	50-68	Variable----------	---	---	---	---	---	---	---	---	---
3A---------- Altavista	0-12	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	12-42	Clay loam, sandy clay loam, loam.	CL, CL-ML, SC, SM-SC	A-4, A-6, A-7	0	95-100	95-100	60-99	45-75	20-45	5-28
	42-68	Variable----------	---	---	---	---	---	---	---	---	---
4B3, 4C3--------- Appling	0-4	Sandy clay loam	CL, SC, CL-ML, SM-SC	A-6, A-4	0-5	95-100	85-100	70-95	40-70	20-40	6-20
	4-30	Sandy clay, clay loam, clay.	MH, ML, CL	A-7	0-5	95-100	90-100	70-95	51-80	41-74	15-30
	30-42	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6, A-7	0-5	95-100	85-100	70-90	40-75	25-45	8-22
	42-64	Variable----------	---	---	---	---	---	---	---	---	---
5B---------- Appling	0-12	Gravelly coarse sandy loam.	SM	A-2, A-1-b	5-15	70-95	55-85	40-75	15-30	---	NP
	12-30	Sandy clay, clay loam, clay.	MH, ML, CL	A-7	0-5	95-100	90-100	70-95	51-80	41-74	15-30
	30-43	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6, A-7	0-5	95-100	85-100	70-90	40-75	25-45	8-22
	43-63	Variable----------	---	---	---	---	---	---	---	---	---
6B*, 6C*:											
Appling----------	0-12	Gravelly coarse sandy loam.	SM	A-2, A-1-b	5-15	70-95	55-85	40-75	15-30	---	NP
	12-30	Sandy clay, clay loam, clay.	MH, ML, CL	A-7	0-5	95-100	90-100	70-95	51-80	41-74	15-30
	30-43	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6, A-7	0-5	95-100	85-100	70-90	40-75	25-45	8-22
	43-63	Variable----------	---	---	---	---	---	---	---	---	---
Louisburg-------	0-11	Gravelly coarse sandy loam.	SM, SM-SC	A-2, A-1-b	0-15	70-100	50-75	35-60	20-35	<25	NP-6
	11-24	Sandy loam, gravelly sandy loam.	SM, SM-SC	A-2, A-4	0-15	80-100	60-90	40-70	25-40	<30	NP-7
	24-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
7B*, 7C*:											
Appling---------	0-12	Gravelly coarse sandy loam.	SM	A-2, A-1-b	5-15	70-95	55-85	40-75	15-30	---	NP
	12-30	Sandy clay, clay loam, clay.	MH, ML, CL	A-7	0-5	95-100	90-100	70-95	51-80	41-74	15-30
	30-43	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6, A-7	0-5	95-100	85-100	70-90	40-75	25-45	8-22
	43-63	Variable---------	---	---	---	---	---	---	---	---	---
Mattaponi-------	0-15	Sandy loam-------	SM, SC, ML, CL	A-2, A-4, A-6	0	80-100	75-100	50-100	20-85	15-35	NP-15
	15-60	Clay loam, sandy clay, clay.	CL, CH, SC	A-6, A-7	0	80-100	75-100	65-100	45-95	35-70	15-40
	60-69	Variable---------	---	---	---	---	---	---	---	---	---
8A----------	0-8	Loamy fine sand	SM	A-2	0	95-100	95-100	50-100	15-30	<20	NP
Bojac	8-47	Fine sandy loam, loam, sandy loam.	ML, SM	A-2, A-4	0	95-100	95-100	55-100	20-60	<35	NP-10
	47-85	Stratified loamy fine sand to gravel.	SP	A-1, A-2, A-3	0-15	70-100	50-100	12-100	2-35	<20	NP
9A----------	0-3	Silt loam--------	CL, ML	A-4, A-6	0	100	95-100	90-100	60-90	20-35	3-15
Chenneby	3-47	Loam, silt loam, silty clay loam.	CL, ML, MH, CH	A-4, A-6, A-7	0	100	95-100	90-100	75-95	30-55	8-20
	47-62	Stratified sandy loam to silty clay loam.	SM, ML, SC, CL	A-2-4, A-4	0	100	100	65-90	20-75	<30	NP-8
10B3, 10C3-------	0-4	Clay loam--------	CL, CH	A-6, A-7	0	100	95-100	80-100	55-98	35-60	15-35
Craven	4-42	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	90-100	65-98	51-70	24-43
	42-60	Sandy clay loam, sandy loam, loamy sand.	SM, SM-SC, SC	A-2, A-4, A-6	0	100	95-100	50-100	15-49	<35	NP-15
11A----------	0-17	Loamy sand-------	SM	A-2	0	95-100	92-100	60-80	13-30	---	NP
Dothan	17-44	Sandy clay loam, sandy loam, fine sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-49	<40	NP-16
	44-78	Sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-53	25-45	4-23
12B----------	0-15	Loamy fine sand	SM, SM-SC	A-2, A-1, A-4	0-3	90-100	80-100	40-85	15-40	<18	NP-7
Emporia	15-32	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-2, A-4, A-6, A-7	0-2	90-100	80-100	45-95	25-70	20-50	8-30
	32-57	Sandy clay loam, clay loam, sandy clay.	SC, CL, CH	A-2, A-4, A-6, A-7	0-2	90-100	80-100	45-95	30-80	25-55	8-30
	57-70	Stratified sandy loam to clay loam.	SM, SC, ML, CL	A-1, A-2, A-4, A-6	0-5	70-100	55-100	30-90	20-60	<40	NP-25

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
13A---------- Faceville	0-11	Loamy sand-------	SM	A-2	0	90-100	85-100	72-97	13-25	---	NP
	11-44	Sandy clay loam, sandy clay.	SC, ML, CL, SM	A-4, A-6	0	98-100	90-100	85-98	46-66	<35	NP-13
	44-68	Sandy clay, clay, clay loam.	CL, SC, CH, ML	A-6, A-7	0	98-100	95-100	75-99	45-72	25-52	11-25
14B---------- Fluvanna	0-5	Loam----------	SM, SC, ML, CL	A-2, A-4, A-6	0	85-100	80-100	55-100	30-90	16-35	NP-16
	5-55	Clay, silty clay, silty clay loam.	CH	A-7	0	95-100	95-100	85-100	70-95	45-75	20-45
	55-99	Clay loam, silty clay loam, gravelly clay loam.	CL, GC, SC	A-6, A-7, A-2	0-5	50-100	45-100	40-100	30-95	30-50	11-25
15B3, 15C3------- Fluvanna	0-11	Clay loam--------	CL	A-6, A-7	0	85-100	80-100	70-100	55-95	30-46	12-25
	11-46	Clay, silty clay, silty clay loam.	CH	A-7	0	95-100	95-100	85-100	70-95	45-75	20-45
	46-60	Clay loam, silty clay loam, gravelly clay loam.	CL, GC, SC	A-6, A-7, A-2	0-5	50-100	45-100	40-100	30-95	30-50	11-25
16B3*, 16C3*: Fluvanna--------	0-11	Clay loam--------	CL	A-6, A-7	0	85-100	80-100	70-100	55-95	30-46	12-25
	11-46	Clay, silty clay, silty clay loam.	CH	A-7	0	95-100	95-100	85-100	70-95	45-75	20-45
	46-60	Clay loam, silty clay loam, gravelly clay loam.	CL, GC, SC	A-6, A-7, A-2	0-5	50-100	45-100	40-100	30-95	30-50	11-25
Goldston--------	0-6	Channery silt loam.	GM, SM, ML	A-2-4, A-4	10-25	60-80	50-80	30-80	25-75	20-40	NP-10
	6-19	Very channery silt loam, very channery very fine sandy loam.	GM, SM, ML	A-2-4, A-4, A-1-b	10-25	60-80	50-80	25-80	20-60	20-40	NP-10
	19-26	Weathered bedrock	---	---	---	---	---	---	---	---	---
	26-30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
17B*, 17C*: Fluvanna--------	0-5	Fine sandy loam	SM, SC, ML, CL	A-2, A-4, A-6	0	85-100	80-100	55-100	30-90	16-35	NP-16
	5-55	Clay, silty clay, silty clay loam.	CH	A-7	0	95-100	95-100	85-100	70-95	45-75	20-45
	55-99	Clay loam, silty clay loam, gravelly clay loam.	CL, GC, SC	A-6, A-7, A-2	0-5	50-100	45-100	40-100	30-95	30-50	11-25
Mattaponi-------	0-15	Sandy loam-------	SM, SC, ML, CL	A-2, A-4, A-6	0	80-100	75-100	50-100	20-85	15-35	NP-15
	15-60	Clay loam, sandy clay, clay.	CL, CH, SC	A-6, A-7	0	80-100	75-100	65-100	45-95	35-70	15-40
	60-69	Variable---------	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
18B---------- Georgeville	0-8	Loam----------	ML	A-4, A-6	0-2	90-100	80-100	65-100	65-95	<40	NP-11
	8-12	Silty clay loam, clay loam.	CL, ML	A-6, A-7, A-4	0-1	90-100	90-100	85-100	70-98	30-49	8-20
	12-45	Clay, silty clay, silty clay loam.	MH, ML	A-7	0-1	95-100	95-100	90-100	75-98	41-79	15-40
	45-60	Silty clay loam, loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0-5	90-100	90-100	65-100	51-95	<30	NP-12
19B3, 19C3------- Georgeville	0-12	Clay loam--------	CL, ML	A-6, A-7	0-2	90-100	90-100	85-100	65-98	30-49	11-20
	12-45	Clay, silty clay, silty clay loam.	MH, ML	A-7	0-1	95-100	95-100	90-100	75-98	41-79	15-40
	45-60	Silty clay loam, loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0-5	90-100	90-100	65-100	51-95	<30	NP-12
20B---------- Helena	0-6	Gravelly coarse sandy loam.	SM, SC, GM, GC	A-2, A-4	0-5	60-100	50-75	40-60	26-46	<30	NP-9
	6-30	Clay loam, sandy clay, clay.	CH	A-7	0-5	95-100	95-100	73-97	56-86	50-85	24-50
	30-60	Variable---------	---	---	---	---	---	---	---	---	---
21B---------- Iredell	0-7	Loam----------	ML, CL-ML, CL	A-4, A-6	0-1	99-100	95-100	80-95	51-70	25-38	5-12
	7-26	Clay----------	CH	A-7	0	99-100	60-100	60-100	55-95	54-115	29-85
	26-31	Loam, sandy clay loam, clay loam.	CL, CH, SC	A-7	0-1	98-100	85-100	70-95	40-75	41-60	20-39
	31-60	Variable---------	---	---	---	---	---	---	---	---	---
22C3---------- Iredell	0-4	Clay loam--------	ML, CL-ML, CL	A-4, A-6	0-1	99-100	95-100	80-95	51-70	25-38	5-12
	4-31	Clay----------	CH	A-7	0	99-100	60-100	60-100	55-95	54-115	29-85
	31-60	Variable---------	---	---	---	---	---	---	---	---	---
23D*: Louisburg-------	0-11	Gravelly coarse sandy loam.	SM, SM-SC	A-2, A-1-b	0-15	70-100	50-75	35-60	20-35	<25	NP-6
	11-24	Sandy loam, gravelly sandy loam.	SM, SM-SC	A-2, A-4	0-15	80-100	60-90	40-70	25-40	<30	NP-7
	24-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-60	----------	---	---	---	---	---	---	---	---	---
24B---------- Mattaponi	0-15	Sandy loam-------	SM, SC, ML, CL	A-2, A-4, A-6	0	80-100	75-100	50-100	20-85	15-35	NP-15
	15-60	Clay loam, sandy clay, clay.	CL, CH, SC	A-6, A-7	0	80-100	75-100	65-100	45-95	35-70	15-40
	60-69	Variable---------	---	---	---	---	---	---	---	---	---
25B, 25C--------- Mattaponi	0-5	Gravelly sandy loam.	GM, GC, SM, SC	A-1, A-2, A-4, A-6	0-20	40-80	35-75	20-75	15-60	<30	NP-15
	5-42	Gravelly clay loam, gravelly sandy clay, gravelly clay.	SC, CL, CH, GC	A-2, A-6, A-7	0-10	55-80	50-75	40-75	25-70	35-70	15-40
	42-60	Variable---------	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
26A---------- Orangeburg	0-16	Loamy sand-------	SM	A-2	0	98-100	95-100	60-87	14-28	---	NP
	16-57	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	0	98-100	95-100	71-96	38-58	22-40	3-19
	57-71	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	0	98-100	95-100	70-97	40-65	24-46	8-21
27A---------- Peawick	0-4	Loam----------	SM, SC, CL-ML	A-4	0	90-100	75-100	50-100	40-90	15-30	NP-8
	4-65	Clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	90-100	75-100	70-100	70-95	35-80	12-50
28B3, 28C3------- Peawick	0-3	Clay loam--------	CL, CH	A-6, A-7	0	90-100	75-100	70-100	70-80	30-55	12-30
	3-65	Clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	90-100	75-100	70-100	70-95	35-80	12-50
29. Pits, quarry											
30A---------- Riverview	0-6	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	60-80	15-30	3-14
	6-38	Sandy clay loam, silty clay loam, loam.	CL, ML, CL-ML	A-4, A-6	0	100	100	90-100	60-95	20-40	3-20
	38-81	Loamy fine sand, sandy loam, sand.	SM, SM-SC	A-2, A-4	0	100	100	50-95	15-45	<20	NP-7
31A---------- Roanoke	0-5	Loam----------	SM-SC, CL-ML, CL, SC	A-4, A-6	0	95-100	85-100	60-100	35-90	20-35	5-16
	5-43	Clay, silty clay, clay loam.	CH, CL	A-7	0	90-100	85-100	85-100	65-95	45-70	22-40
	43-74	Stratified sand to clay.	CL-ML, GM-GC, CH, SM	A-1, A-2, A-4	0-5	40-100	35-100	25-95	15-90	10-60	NP-40
32A---------- Roanoke	0-16	Silt loam--------	SM-SC, CL-ML, CL, SC	A-6, A-4	0	95-100	85-100	60-100	35-90	20-35	5-16
	16-53	Clay, silty clay, clay loam.	CH, CL	A-7	0	90-100	85-100	85-100	65-95	45-70	22-40
	53-77	Stratified sandy clay to clay.	CL, SM, CH, ML	A-2-4, A-4, A-6, A-7	0-5	40-100	35-100	25-95	15-90	10-60	NP-40
33A---------- Slagle	0-9	Fine sandy loam	SM, SC, SM-SC	A-2, A-4	0-12	95-100	90-100	55-95	20-50	<25	NP-10
	9-20	Fine sandy loam, sandy clay loam, loam.	SC, SM-SC, CL, CL-ML	A-4, A-6	0-2	95-100	90-100	65-85	35-60	20-40	5-20
	20-55	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6, A-7	0-2	95-100	90-100	75-95	40-75	25-50	8-30
	55-66	Stratified loamy sand to clay loam.	SM, SC, ML, CL	A-1, A-2, A-4, A-6	0-5	90-100	75-100	40-90	20-70	<40	NP-25

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
34A---------- State	0-20	Loamy sand-------	SM, SM-SC	A-2, A-1	0	95-100	95-100	45-75	15-30	<18	NP-6
	20-48	Loam, clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	95-100	95-100	75-100	35-80	24-40	8-22
	48-63	Stratified sand to fine sandy loam.	SM, SM-SC, SP-SM	A-1, A-2, A-3, A-4	0	85-100	75-100	40-90	5-50	<25	NP-7
35A---------- Tarboro	0-32	Loamy sand-------	SM, SP-SM, SW-SM	A-2, A-3, A-1	0	95-100	85-100	40-99	8-35	---	NP
	32-72	Sand, coarse sand, loamy sand.	SP, SP-SM, SW-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-100	3-15	---	NP
36B---------- Uchee	0-34	Loamy sand-------	SM	A-2, A-1-b	0	90-100	80-100	40-70	15-30	---	NP
	34-52	Sandy loam, sandy clay loam.	SC, SM-SC	A-2, A-4, A-6	0	90-100	80-100	50-80	25-50	20-40	6-20
	52-66	Sandy clay loam, sandy clay, clay.	MH, CH, CL, SC	A-7	0	90-100	80-100	65-90	40-70	41-70	18-38
37. Udorthents											
38A---------- Wickham	0-8	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	95-100	90-100	70-100	45-80	<25	NP-7
	8-76	Sandy clay loam, clay loam, loam.	CL-ML, CL, SC, SM-SC	A-2, A-4, A-6, A-7-6	0	95-100	90-100	75-100	30-70	20-41	5-15
39A---------- Wickham	0-6	Sandy loam-------	SM, SM-SC, ML, CL-ML	A-4	0	95-100	90-100	70-100	45-80	<25	NP-7
	6-55	Sandy clay loam, clay loam, loam.	CL-ML, CL, SC, SM-SC	A-2, A-4, A-6, A-7-6	0	95-100	90-100	75-100	30-70	20-41	5-15
	55-70	Variable---------	---	---	---	---	---	---	---	---	---
40A---------- Woodington	0-17	Fine sandy loam	SM	A-2, A-4	0	100	95-100	50-100	20-50	<25	NP-3
	17-43	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	100	95-100	50-100	20-50	<25	NP-3
	43-76	Sandy loam, loamy sand, loamy fine sand.	SM, SP-SM	A-2, A-4	0	100	95-100	50-100	10-50	<25	NP-3

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
1B----------	0-9	10-27	1.25-1.45	0.6-6.0	0.12-0.20	4.5-6.0	<2	Low-------	0.32	3	5	.5-2
Abell	9-14	18-35	1.35-1.55	0.6-2.0	0.13-0.19	4.5-6.0	<2	Low-------	0.28			
	14-40	30-45	1.35-1.55	0.6-2.0	0.11-0.17	4.5-6.0	<2	Moderate	0.28			
	40-65	10-27	1.45-1.60	0.6-6.0	0.08-0.18	4.5-6.0	<2	Low-------	0.28			
2A----------	0-10	10-24	1.30-1.50	2.0-6.0	0.12-0.20	3.6-6.0	<2	Low-------	0.24	5	3	.5-3
Altavista	10-50	18-35	1.30-1.50	0.6-2.0	0.12-0.20	3.6-6.0	<2	Low-------	0.24			
	50-68	---	---	---	---	---	---	----------	----			
3A----------	0-12	10-24	1.30-1.50	2.0-6.0	0.12-0.20	3.6-6.0	<2	Low-------	0.24	5	3	.5-3
Altavista	12-42	18-35	1.30-1.50	0.6-2.0	0.12-0.20	3.6-6.0	<2	Low-------	0.24			
	42-68	---	---	---	---	---	---	----------	----			
4B3, 4C3----	0-4	20-35	1.30-1.45	0.6-2.0	0.12-0.15	4.5-5.5	<2	Low-------	0.28	3	5	.5-1
Appling	4-30	35-60	1.25-1.45	0.6-2.0	0.15-0.17	4.5-5.5	<2	Low-------	0.28			
	30-42	20-50	1.25-1.45	0.6-2.0	0.12-0.16	4.5-5.5	<2	Low-------	0.28			
	42-64	---	---	---	---	---	---	----------	----			
5B----------	0-12	5-20	1.45-1.65	2.0-6.0	0.08-0.13	4.5-5.5	<2	Low-------	0.15	4	2	.5-2
Appling	12-30	35-60	1.25-1.45	0.6-2.0	0.15-0.17	4.5-5.5	<2	Low-------	0.28			
	30-43	20-50	1.25-1.45	0.6-2.0	0.12-0.16	4.5-5.5	<2	Low-------	0.28			
	43-63	---	---	---	---	---	---	----------	----			
6B*, 6C*:												
Appling----	0-12	5-20	1.45-1.65	2.0-6.0	0.08-0.13	4.5-5.5	<2	Low-------	0.15	4	2	.5-2
	12-30	35-60	1.25-1.45	0.6-2.0	0.15-0.17	4.5-5.5	<2	Low-------	0.28			
	30-43	20-50	1.25-1.45	0.6-2.0	0.12-0.16	4.5-5.5	<2	Low-------	0.28			
	43-63	---	---	---	---	---	---	----------	----			
Louisburg---	0-11	5-15	1.35-1.55	6.0-20	0.07-0.10	4.5-6.0	<2	Very low	0.24	3	2	.5-2
	11-24	7-18	1.40-1.60	6.0-20	0.08-0.12	4.5-6.0	<2	Very low	0.24			
	24-60	---	---	---	---	---	---	----------	----			
7B*, 7C*:												
Appling----	0-12	5-20	1.45-1.65	2.0-6.0	0.08-0.13	4.5-5.5	<2	Low-------	0.15	4	2	.5-2
	12-30	35-60	1.25-1.45	0.6-2.0	0.15-0.17	4.5-5.5	<2	Low-------	0.28			
	30-43	20-50	1.25-1.45	0.6-2.0	0.12-0.16	4.5-5.5	<2	Low-------	0.28			
	43-63	---	---	---	---	---	---	----------	----			
Mattaponi---	0-15	5-27	1.25-1.55	0.6-6.0	0.08-0.20	4.5-5.5	<2	Low-------	0.32	3	3	.5-2
	15-60	35-65	1.40-1.65	0.2-0.6	0.12-0.18	4.5-5.5	<2	Moderate	0.28			
	60-69	---	---	---	---	---	---	----------	----			
8A----------	0-8	3-8	1.20-1.50	6.0-20	0.05-0.10	3.6-6.5	<2	Low-------	0.17	3	2	.5-1
Bojac	8-47	11-16	1.35-1.55	2.0-6.0	0.08-0.16	3.6-6.5	<2	Low-------	0.17			
	47-85	1-6	1.30-1.80	6.0-20.0	0.02-0.05	4.5-6.0	<2	Low-------	0.17			
9A----------	0-3	12-27	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	<2	Low-------	0.37	5	5	.5-3
Chenneby	3-47	12-35	1.30-1.50	0.6-2.0	0.15-0.20	4.5-6.0	<2	Low-------	0.32			
	47-62	8-30	1.30-1.50	2.0-6.0	0.05-0.10	4.5-6.0	<2	Low-------	0.24			
10B3, 10C3--	0-4	27-40	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	<2	Moderate	0.37	5	6	.5-2
Craven	4-42	35-60	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	<2	Moderate	0.32			
	42-60	5-35	1.35-1.60	0.2-6.0	0.08-0.14	3.6-5.5	<2	Low-------	0.32			

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
11A----------	0-17	5-15	1.30-1.60	2.0-6.0	0.06-0.10	4.5-6.0	<2	Very low	0.15	5	2	<.5
Dothan	17-44	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	<2	Low-------	0.28			
	44-78	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-6.0	<2	Low-------	0.28			
12B----------	0-15	5-10	1.30-1.40	6.0-20	0.05-0.10	4.5-6.0	<2	Low-------	0.28	4	2	.5-2
Emporia	15-32	18-35	1.35-1.45	0.2-2.0	0.10-0.18	4.5-6.0	<2	Low-------	0.28			
	32-57	21-40	1.45-1.60	0.06-0.6	0.10-0.16	4.5-6.0	<2	Moderate	0.20			
	57-70	5-40	1.45-1.60	0.06-2.0	0.08-0.18	4.5-6.0	<2	Moderate	0.20			
13A----------	0-11	2-10	1.45-1.65	6.0-20	0.06-0.09	4.5-5.5	<2	Low-------	0.17	5	2	.5-1
Faceville	11-44	20-36	1.35-1.60	0.6-2.0	0.12-0.15	4.5-5.5	<2	Low-------	0.37			
	44-68	35-55	1.25-1.60	0.6-2.0	0.12-0.18	4.5-6.0	<2	Low-------	0.37			
14B----------	0-5	5-27	1.25-1.55	2.0-6.0	0.10-0.15	4.5-5.5	<2	Low-------	0.37	4	3	1-3
Fluvanna	5-55	35-65	1.30-1.60	0.06-0.6	0.10-0.17	4.5-5.5	<2	Moderate	0.28			
	55-99	20-40	1.30-1.60	0.06-0.6	0.05-0.09	4.5-5.5	<2	Moderate	0.28			
15B3, 15C3-------	0-11	27-40	1.30-1.55	0.6-2.0	0.16-0.19	4.5-5.5	<2	Moderate	0.37	3	7	.5-2
Fluvanna	11-46	35-65	1.30-1.60	0.06-0.6	0.10-0.17	4.5-5.5	<2	Moderate	0.28			
	46-60	20-40	1.30-1.60	0.06-0.6	0.05-0.09	4.5-5.5	<2	Moderate	0.28			
16B3*, 16C3*:												
Fluvanna--------	0-11	27-40	1.30-1.55	0.6-2.0	0.16-0.19	4.5-5.5	<2	Moderate	0.37	3	7	.5-2
	11-46	35-65	1.30-1.60	0.06-0.6	0.10-0.17	4.5-5.5	<2	Moderate	0.28			
	46-60	20-40	1.30-1.60	0.06-0.6	0.05-0.09	4.5-5.5	<2	Moderate	0.28			
Goldston--------	0-6	5-27	1.40-1.60	2.0-6.0	0.10-0.16	3.6-5.5	<2	Low-------	0.15	1	8	.5-2
	6-19	5-27	1.40-1.60	2.0-6.0	0.06-0.12	3.6-5.5	<2	Low-------	0.05			
	19-26	---	---	---	---	---	---	----------	----			
	26-30	---	---	---	---	---	---	----------	----			
17B*, 17C*:												
Fluvanna--------	0-5	5-27	1.25-1.55	2.0-6.0	0.10-0.15	4.5-5.5	<2	Low-------	0.37	4	3	1-3
	5-55	35-65	1.30-1.60	0.06-0.6	0.10-0.17	4.5-5.5	<2	Moderate	0.28			
	55-99	20-40	1.30-1.60	0.06-0.6	0.05-0.09	4.5-5.5	<2	Moderate	0.28			
Mattaponi-------	0-15	5-27	1.25-1.55	0.6-6.0	0.08-0.20	4.5-5.5	<2	Low-------	0.32	3	3	.5-2
	15-60	35-65	1.40-1.65	0.2-0.6	0.12-0.18	4.5-5.5	<2	Moderate	0.28			
	60-69	---	---	---	---	---	---	----------	----			
18B----------	0-8	5-27	1.20-1.40	0.6-2.0	0.15-0.20	4.5-6.0	<2	Low-------	0.43	4	5	.5-2
Georgeville	8-12	27-35	1.20-1.40	0.6-2.0	0.13-0.18	4.5-5.5	<2	Low-------	0.32			
	12-45	35-60	1.20-1.40	0.6-2.0	0.13-0.18	4.5-5.5	<2	Low-------	0.28			
	45-60	15-40	1.20-1.40	0.6-2.0	0.05-0.10	4.5-5.5	<2	Low-------	0.32			
19B3, 19C3-------	0-12	27-35	1.20-1.40	0.6-2.0	0.13-0.18	4.5-6.0	<2	Low-------	0.49	4	6	<.5
Georgeville	12-45	35-60	1.20-1.40	0.6-2.0	0.13-0.18	4.5-5.5	<2	Low-------	0.28			
	45-60	15-40	1.20-1.40	0.6-2.0	0.05-0.10	4.5-5.5	<2	Low-------	0.32			
20B----------	0-6	5-20	1.58-1.62	2.0-6.0	0.08-0.10	4.5-6.0	<2	Low-------	0.15	3	8	.5-2
Helena	6-30	35-60	1.44-1.55	0.06-0.2	0.13-0.15	4.5-5.5	<2	High------	0.28			
	30-60	---	---	---	---	---	---	----------	----			
21B----------	0-7	15-35	1.20-1.40	0.6-2.0	0.14-0.17	5.1-7.3	<2	Low-------	0.32	3	6	.5-2
Iredell	7-26	40-60	1.20-1.45	0.06-0.2	0.16-0.22	5.6-7.3	<2	Very high	0.20			
	26-31	15-35	1.30-1.60	0.06-0.2	0.14-0.18	6.1-7.8	<2	High------	0.28			
	31-60	---	---	---	---	---	---	----------	----			
22C3----------	0-4	15-35	1.20-1.40	0.6-2.0	0.14-0.17	5.1-7.3	<2	Low-------	0.32	3	6	.5-2
Iredell	4-31	40-60	1.20-1.45	0.06-0.2	0.16-0.22	5.6-7.3	<2	Very high	0.20			
	31-60	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
23D*:												
Louisburg	0-11	5-15	1.35-1.55	6.0-20	0.07-0.10	4.5-6.0	<2	Very low	0.24	3	8	.5-2
	11-24	7-18	1.40-1.60	6.0-20	0.08-0.12	4.5-6.0	<2	Very low	0.24			
	24-60	---	---	---	---	---	---	---	---			
Rock outcrop	0-60	---	---	---	---	---	<2	---	---	---	---	---
24B	0-15	5-27	1.25-1.55	0.6-6.0	0.08-0.20	4.5-5.5	<2	Low	0.32	3	3	.5-2
Mattaponi	15-60	35-65	1.40-1.65	0.2-0.6	0.12-0.18	4.5-5.5	<2	Moderate	0.28			
	60-69	---	---	---	---	---	---	---	---			
25B, 25C	0-5	5-27	1.25-1.55	2.0-6.0	0.05-0.15	4.5-5.5	<2	Low	0.28	4	8	1-3
Mattaponi	5-42	35-65	1.45-1.70	0.2-0.6	0.05-0.11	4.5-5.5	<2	Moderate	0.28			
	42-60	---	---	---	---	---	---	---	---			
26A	0-16	4-10	1.35-1.55	2.0-6.0	0.06-0.09	4.5-6.0	<2	Low	0.10	5	2	.5-1
Orangeburg	16-57	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	<2	Low	0.24			
	57-71	20-45	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	<2	Low	0.24			
27A	0-4	10-25	1.20-1.30	0.6-2.0	0.10-0.17	3.6-5.5	<2	Low	0.37	4	3	.5-2
Peawick	4-65	35-60	1.30-1.50	<0.06	0.10-0.17	3.6-5.5	<2	High	0.24			
28B3, 28C3	0-3	25-40	1.25-1.35	0.2-0.6	0.12-0.19	3.6-5.5	<2	Moderate	0.37	3	6	.5-1
Peawick	3-65	35-60	1.30-1.50	<0.06	0.10-0.17	3.6-5.5	<2	High	0.24			
29. Pits, quarry												
30A	0-6	10-27	1.30-1.60	0.6-2.0	0.16-0.24	4.5-6.5	<2	Low	0.32	5	5	.5-2
Riverview	6-38	18-35	1.20-1.40	0.6-2.0	0.15-0.22	4.5-6.0	<2	Low	0.24			
	38-81	4-18	1.20-1.50	2.0-6.0	0.07-0.11	4.5-6.0	<2	Low	0.17			
31A	0-5	10-27	1.20-1.50	0.6-2.0	0.14-0.20	3.6-5.5	<2	Low	0.37	4	8	.5-2
Roanoke	5-43	35-60	1.35-1.65	0.06-0.2	0.10-0.19	3.6-5.5	<2	Moderate	0.24			
	43-74	5-50	1.20-1.50	0.06-20	0.04-0.14	3.6-6.5	<2	Moderate	0.24			
32A	0-16	10-27	1.20-1.50	0.6-2.0	0.14-0.20	4.5-5.5	<2	Low	0.37	4	8	.5-3
Roanoke	16-53	35-60	1.35-1.65	0.06-0.2	0.10-0.19	4.5-5.5	<2	Moderate	0.24			
	53-77	5-50	1.20-1.50	0.06-20	0.04-0.14	4.5-5.5	<2	Moderate	0.24			
33A	0-9	8-18	1.30-1.45	2.0-6.0	0.10-0.14	3.6-5.5	<2	Low	0.28	3	3	.5-2
Slagle	9-20	12-35	1.30-1.45	0.6-2.0	0.10-0.18	3.6-5.5	<2	Low	0.24			
	20-55	18-40	1.35-1.60	0.06-0.6	0.12-0.18	3.6-5.5	<2	Moderate	0.24			
	55-66	5-32	1.35-1.50	0.2-6.0	0.08-0.15	3.6-5.5	<2	Low	0.24			
34A	0-20	2-8	1.35-1.45	2.0-6.0	0.06-0.09	3.6-5.5	<2	Low	0.28	5	2	<1
State	20-48	18-34	1.35-1.50	0.6-2.0	0.14-0.19	3.6-5.5	<2	Low	0.28			
	48-63	2-15	1.35-1.50	>2.0	0.02-0.10	3.6-5.5	<2	Low	0.17			
35A	0-32	3-12	1.60-1.75	6.0-20	0.05-0.09	5.1-6.5	<2	Low	0.10	5	2	.5-1
Tarboro	32-72	2-7	1.60-1.75	>20	0.02-0.06	5.1-6.5	<2	Low	0.10			
36B	0-34	3-10	1.30-1.70	6.0-20	0.05-0.10	4.5-5.5	<2	Low	0.10	5	2	<1
Uchee	34-52	8-30	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low	0.24			
	52-66	25-50	1.40-1.60	0.2-0.6	0.10-0.16	4.5-5.5	<2	Moderate	0.28			
37. Udorthents												
38A	0-8	8-15	1.45-1.65	2.0-6.0	0.11-0.16	4.5-6.0	<2	Low	0.24	5	3	.5-2
Wickham	8-76	18-35	1.30-1.50	0.6-2.0	0.12-0.17	4.5-6.0	<2	Low	0.24			

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
39A----------	0-6	8-15	1.45-1.65	2.0-6.0	0.11-0.16	4.5-6.0	<2	Low-------	0.24	5	3	.5-2
Wickham	6-55	18-35	1.30-1.40	0.6-2.0	0.12-0.17	4.5-6.0	<2	Low-------	0.24			
	55-70	---	---	---	---	---	---	----------	----			
40A----------	0-17	5-18	1.45-1.65	2.0-6.0	0.10-0.15	3.6-5.5	<2	Low-------	0.20	5	3	2-4
Woodington	17-43	5-18	1.45-1.65	2.0-6.0	0.10-0.15	3.6-5.5	<2	Low-------	0.20			
	43-76	3-18	1.45-1.65	2.0-20	0.06-0.15	3.6-5.5	<2	Low-------	0.10			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 19.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
1B---------- Abell	B	None--------	---	---	2.0-3.5	Apparent	Dec-Mar	>60	---	Moderate	High.
2A---------- Altavista	C	None--------	---	---	1.5-2.5	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
3A---------- Altavista	C	Frequent----	Very brief	Mar-Jul	1.5-2.5	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
4B3, 4C3, 5B------ Appling	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
6B*, 6C*:											
Appling----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Louisburg--------	B	None--------	---	---	>6.0	---	---	>40	Hard	Low------	Moderate.
7B*, 7C*:											
Appling----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Mattaponi--------	C	None--------	---	---	3.0-6.0	Perched	Dec-Mar	>60	---	High-----	High.
8A---------- Bojac	B	Frequent----	Brief-----	Sep-Jul	4.0-6.0	Apparent	Nov-Apr	>60	---	Low------	High.
9A---------- Chenneby	C	Frequent----	Very brief	Dec-Apr	1.0-2.5	Apparent	Jan-Mar	>60	---	High-----	Moderate.
10B3, 10C3-------- Craven	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	>60	---	High-----	High.
11A---------- Dothan	B	None--------	---	---	3.0-5.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
12B---------- Emporia	C	None--------	---	---	3.0-4.5	Perched	Nov-Apr	>60	---	Moderate	High.
13A---------- Faceville	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
14B, 15B3, 15C3--- Fluvanna	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
16B3*, 16C3*:											
Fluvanna---------	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Goldston---------	C	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	High.
17B*, 17C*:											
Fluvanna---------	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Mattaponi--------	C	None--------	---	---	3.0-6.0	Perched	Dec-Mar	>60	---	High-----	High.
18B, 19B3, 19C3--- Georgeville	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.

See footnote at end of table.

TABLE 19.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
20B---------- Helena	C	None--------	---	---	1.5-2.5	Perched	Jan-Apr	>60	---	High-----	High.
21B, 22C3--------- Iredell	C/D	None--------	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High-----	Low.
23D*:											
Louisburg--------	B	None--------	---	---	>6.0	---	---	>40	Hard	Low------	Moderate.
Rock outcrop-----	D	None to frequent.	---	---	>6.0	---	---	0	Hard	---	---
25B, 25B, 25C----- Mattaponi	C	None--------	---	---	3.0-6.0	Perched	Dec-Mar	>60	---	High-----	High.
26A---------- Orangeburg	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
27A, 28B3, 28C3--- Peawick	D	None--------	---	---	1.5-3.0	Perched	Nov-Mar	>60	---	High-----	High.
29. Pits, quarry											
30A---------- Riverview	B	Frequent----	Brief-----	Dec-Mar	3.0-5.0	Apparent	Dec-Mar	>60	---	Low------	Moderate.
31A---------- Roanoke	D	Frequent----	Brief-----	Nov-Jun	0-1.0	Apparent	Nov-May	>60	---	High-----	High.
32A---------- Roanoke	D	Frequent----	Very long	Oct-Jul	+3-0	Apparent	Oct-Jul	>60	---	High-----	High.
33A---------- Slagle	C	None--------	---	---	1.5-3.0	Perched	Nov-Apr	>60	---	Moderate	High.
34A---------- State	B	None--------	---	---	4.0-6.0	Apparent	Dec-Jun	>60	---	Moderate	High.
35A---------- Tarboro	A	Frequent----	Brief-----	Mar-May	>6.0	---	---	>60	---	Low------	Moderate.
36B---------- Uchee	A	None--------	---	---	3.5-5.0	Perched	Jan-Apr	>60	---	Low------	High.
37. Udorthents											
38A---------- Wickham	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High.
39A---------- Wickham	B	Frequent----	Brief-----	Mar-May	>6.0	---	---	>60	---	Moderate	High.
40A---------- Woodington	B/D	None--------	---	---	0.5-1.0	Apparent	Dec-May	>60	---	High-----	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Abell	Fine-loamy, mixed, thermic Aquic Hapludults
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Appling	Clayey, kaolinitic, thermic Typic Hapludults
Bojac	Coarse-loamy, mixed, thermic Typic Hapludults
Chenneby	Fine-silty, mixed, thermic Fluvaquentic Dystrochrepts
Craven	Clayey, mixed, thermic Aquic Hapludults
Dothan	Fine-loamy, siliceous, thermic Plinthic Paleudults
Emporia	Fine-loamy, siliceous, thermic Typic Hapludults
Faceville	Clayey, kaolinitic, thermic Typic Paleudults
Fluvanna	Clayey, mixed, thermic Typic Hapludults
Georgeville	Clayey, kaolinitic, thermic Typic Hapludults
Goldston	Loamy-skeletal, siliceous, thermic, shallow Typic Dystrochrepts
Helena	Clayey, mixed, thermic Aquic Hapludults
Iredell	Fine, montmorillonitic, thermic Typic Hapludalfs
Louisburg	Coarse-loamy, mixed, thermic Ruptic-Ultic Dystrochrepts
Mattaponi	Clayey, mixed, thermic Typic Hapludults
Orangeburg	Fine-loamy, siliceous, thermic Typic Paleudults
Peawick	Clayey, mixed, thermic Aquic Hapludults
Riverview	Fine-loamy, mixed, thermic Fluventic Dystrochrepts
Roanoke	Clayey, mixed, thermic Typic Ochraquults
Slagle	Fine-loamy, siliceous, thermic Aquic Hapludults
State	Fine-loamy, mixed, thermic Typic Hapludults
Tarboro	Mixed, thermic Typic Udipsamments
Uchee	Loamy, siliceous, thermic Arenic Hapludults
Udorthents	Udorthents
Wickham	Fine-loamy, mixed, thermic Typic Hapludults
Woodington	Coarse-loamy, siliceous, thermic Typic Paleaquults

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