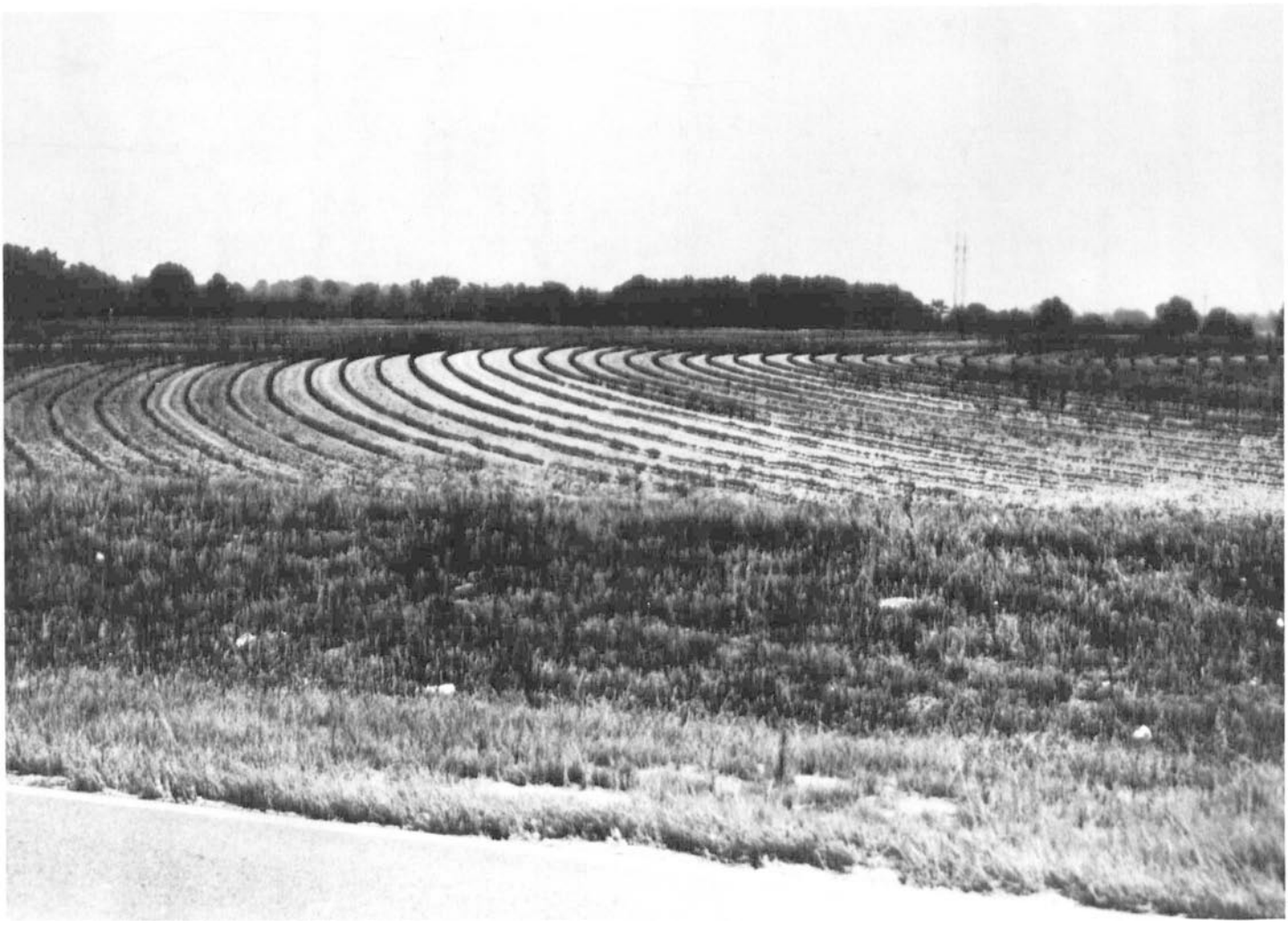
United States Department of Agriculture

Soil Conservation Service

In cooperation with University of Georgia, College of Agriculture, Agricultural Experiment Stations

Soil Survey of Johnson and Laurens Counties, Georgia



How To Use This Soil Survey

General Soil Map

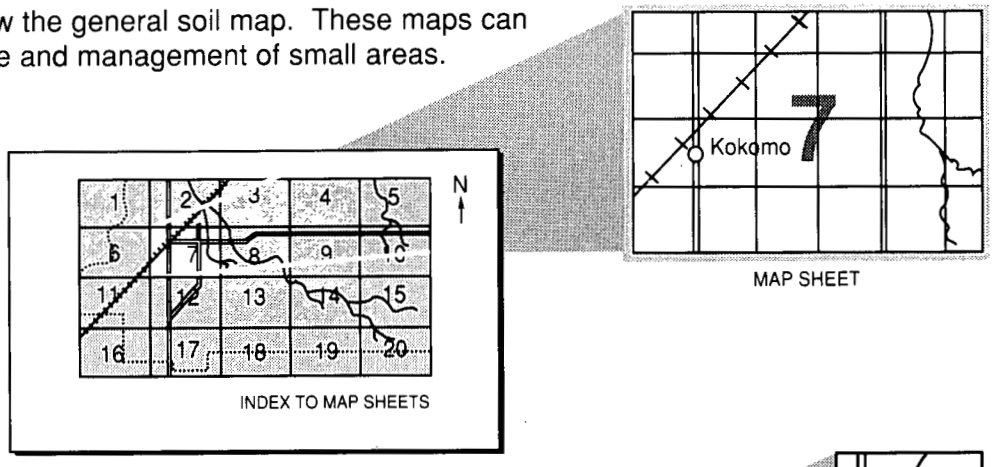
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

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.

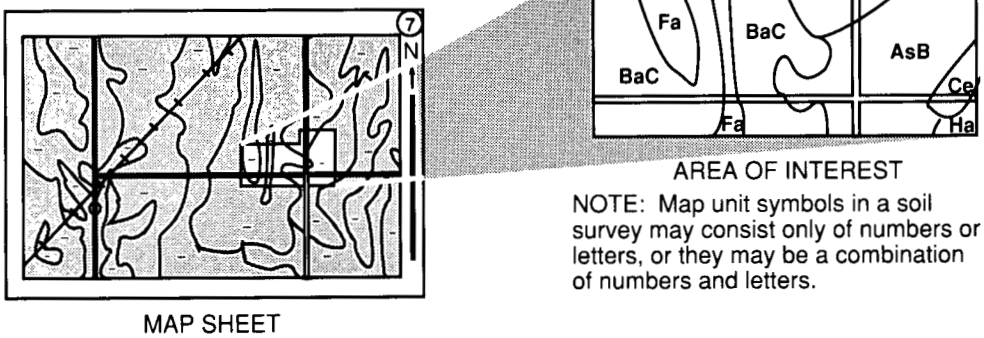
To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



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.

Major fieldwork for this soil survey was completed in 1984. Soil names and descriptions were approved in 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1986. This soil survey was made cooperatively by the Soil Conservation Service and the University of Georgia, College of Agriculture, Agricultural Experiment Stations. It is part of the technical assistance furnished to the Central Georgia 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.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: Soybeans on Tifton loamy sand, 2 to 5 percent slopes. Terraces and contour farming help to control erosion on this soil.

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Issued October 1991

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Summary of Tables

Foreword

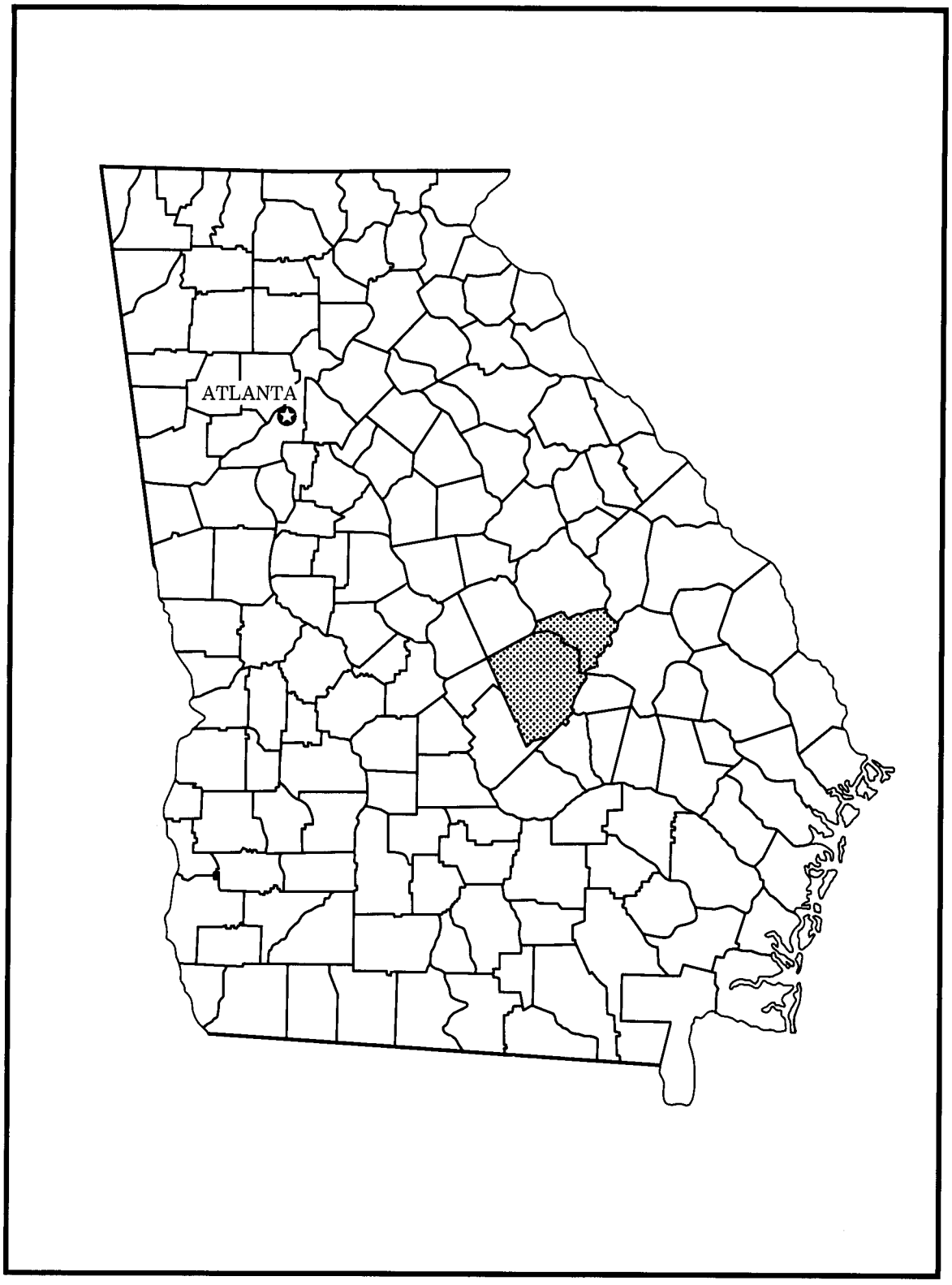
This soil survey contains information that can be used in land-planning programs in Johnson and Laurens Counties. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, 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 suitability 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 over bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to 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.

Hershel R. Read
State Conservationist
Soil Conservation Service



Location of Johnson and Laurens Counties in Georgia.

Soil Survey of Johnson and Laurens Counties, Georgia

By Ernest H. Smith, Soil Conservation Service

Soils surveyed by Ernest H. Smith, Mack Thomas, Jr., James R. Lathem, James O. Murphy, Richard A. Johnston, and Edward E. Looper, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service, in cooperation with the University of Georgia, College of Agriculture, Agricultural Experiment Stations

JOHNSON AND LAURENS COUNTIES are in the central part of Georgia. They have an area of 719,245 acres, or 1,123.8 square miles. The total area of Johnson County is 200,230 acres, and that of Laurens County is 519,015 acres.

The survey area is made up mainly of nearly level to strongly sloping soils on uplands and nearly level soils on flood plains near the Oconee River and the larger creeks. Most of the soils on uplands are well drained. They have a sandy or loamy surface layer and a loamy or clayey subsoil. The soils on flood plains, on broad, smooth uplands, and near drainageways are poorly drained to well drained. They have a loamy or sandy surface layer and a predominantly loamy subsoil or underlying layer.

Most of the soils on ridgetops in the uplands are essentially uneroded. The soils on hillsides, however, commonly are eroded. Most of the better drained, nearly level to gently sloping soils that have a loamy or clayey subsoil are well suited to field crops, hay, pasture, and many nonfarm uses.

This soil survey updates the survey of Laurens County published in 1916 *(12)*. It provides additional information about the soils and has larger maps, which show the soils in greater detail.

General Nature of the Survey Area

A. Leroy Price, district conservationist, and Forrest L. Hill, soil conservationist, helped prepare this section.

This section gives general information concerning the survey area. It describes climate; history; water resources; farming; and physiography, relief, and drainage.

Climate

Prepared by the National Climatic Data Center, Asheville, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Dublin, Georgia, in the period 1951 to 1981. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 48 degrees F and the average daily minimum temperature is 35 degrees. The lowest temperature on record, which occurred at Dublin on January 19, 1977, is 4 degrees. In summer, the average temperature is 80 degrees and the average daily maximum temperature is 93 degrees. The highest recorded temperature, which occurred on July 14, 1980, is 109 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total average annual precipitation is 45.41 inches. Of this, about 23 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than

19 inches. The heaviest 1-day rainfall during the period of record was 5.57 inches at Dublin on February 2, 1973. Thunderstorms occur on about 55 days each year.

Snowfall is rare. In 99 percent of the winters, there is no measurable snowfall. In 1 percent, the snowfall, usually of short duration, is less than 1 inch.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the west-northwest. Average windspeed is highest, 9 miles per hour, in spring.

History

In 1858, an act of the General Assembly of Georgia established Johnson County from Emanuel, Laurens, and Washington Counties. Of the 159 counties in Georgia, Johnson County was the 129th to be organized. It was named for Herschel V. Johnson, Governor of Georgia from 1853 to 1857. Wrightsville, the county seat, was named for John B. Wright, a pioneer resident.

The area that is now Laurens County was originally inhabited by the Creek Indians. In 1807, the county was established from Wilkinson County by an act of the General Assembly of Georgia. It was named in honor of John Laurens of South Carolina, who had fought in the American Revolution. Laurens County was the 31st county in Georgia to be organized. In 1808, about half of the county became Pulaski County. In 1811, the General Assembly added land from Washington and Montgomery Counties to Laurens County. Sumterville was the original county seat. Dublin, the current county seat, received its name from Jonathan Sawyer, a native of Ireland. Some historians indicate that Sawyer was permitted to use the name of Dublin in honor of his wife's birthplace in Ireland.

Water Resources

The Oconee and Ohoopee Rivers, Buckeye Creek, Big Creek, Turkey Creek, Rocky Creek, Deep Creek, Whitewater Creek, Alligator Creek, Pughes Creek, Long Branch, Lime Sink Creek, Okeewalkee Creek, and Hunger Hardship Creek provide water to Johnson and Laurens Counties. Also, many ponds throughout the counties are used for watering livestock, irrigation, and recreation (fig. 1).

Most of the domestic wells in the counties have a diameter of 3 to 6 inches and are 100 to 200 feet deep. These deep wells provide an adequate supply of water, even during dry periods. Recently, wells that are 8 to 12 inches in diameter and range from 250 to 750 feet deep have been used to supply water for irrigation.

Farming

Since the settlement period, the soils in Johnson and Laurens Counties have been used mainly for farming. Cultivated crops, mainly soybeans, corn, peanuts, cotton, and small grain, account for most of the farm income in the counties. A small acreage is used for tobacco. In recent years, the acreage used for cotton has increased. Dairy products, beef cattle, and hogs are important sources of farm income. Johnson County has fewer acres of cultivated crops than Laurens County, but about the same kinds of crops are grown in the two counties. Most of the farm products can be marketed locally.

Since about 1950, the number of the farms in the survey area has decreased. The size of the average farm, however, has increased. Improved farming methods, such as conservation tillage and irrigation, have increased crop yields.

Erosion and low soil fertility have been the most important management concerns on the farmland in the survey area over the years. In the early 1900's, farming became more intensive and tenant farming was widespread. As a result of the misuse of land, the extent of erosion increased dramatically. Changes in land ownership were common, and soil fertility was not maintained in most places.

In 1937, Georgia enacted legislation that created soil conservation districts. This legislation was supported by leading farmers in Johnson and Laurens Counties. Johnson County was included in the Central Georgia Soil and Water Conservation District, which was organized in 1940. Laurens County was added to the district in 1943. Farmers in the two counties began using terraces, grassed waterways, improved pastures, and ponds to control erosion and increase productivity. The soil survey maps made by the Soil Conservation Service became the basis for determining the capability of each soil. Grasses or trees were established in many sloping, seriously eroded fields that had been cultivated.

In the 1960's and early 1970's, public concern about the productive capacity of American agriculture prompted a national inventory of important farmland. The land in Johnson and Laurens Counties best suited to food, feed, forage, fiber, and oilseed crops is identified in the section "Important Farmland."

Physiography, Relief, and Drainage

Johnson and Laurens Counties are in the Southern Coastal Plain Major Land Resource Area. Elevation ranges from 150 feet in an area along the Oconee River

Figure 1.—A pond in an area of Pelham loamy sand. Many ponds are throughout the survey area.

near Turkey Creek Landing to 440 feet in an area in the northern part of Johnson County near Pringle. The soils on uplands generally are well drained. The survey area consists mostly of broad, nearly level soils on ridgetops and very gently sloping and gently sloping soils on ridgetops and hillsides. The landscape is dissected by numerous small drainageways. The slopes on ridgetops commonly are smooth and convex, and the slopes on hillsides commonly are irregular and convex.

The nearly level soils on flood plains generally are poorly drained. They are near the Oconee River, the Ohoopee River, the Little Ohoopee River, Turkey Creek, Rocky Creek, Buckeye Creek, Big Creek, Alligator Creek, Pughes Creek, Long Branch, Lime Sink Creek, Deep Creek, Whitewater Creek, Okeewalkee Creek, Hunger Hardship Creek, and their tributaries. In most of the survey area, the flood plains are somewhat narrow. Near the Oconee River, the Ohoopee River, and Turkey Creek, however, they are wide. The soils near the major streams and their tributaries are frequently flooded during winter and spring. These soils drain slowly and remain wet for long periods.

The major drainage system in both counties is made up of the Oconee River, the Ohoopee River, the Little Ohoopee River, Turkey Creek, Rocky Creek, Buckeye Creek, and their tributaries. The Oconee River flows through the middle of Laurens County. It forms the western boundary of Johnson County. Together with its tributaries, it drains the eastern part of Laurens County. The important tributaries are Brewton Creek, Pughes Creek, Mercer Creek, and Shaddock Creek. Turkey Creek and Rocky Creek and their tributaries drain the western part of Laurens County, and Alligator Creek, Okeewalkee Creek, Lime Sink Creek, Long Branch Creek, and their tributaries drain the southern part.

The Ohoopee River and its tributaries drain most of Johnson County. The Little Ohoopee River and its tributaries, however, drain the northeastern part, and Deep Creek, Buckeye Creek, Big Creek, and their tributaries drain the northwestern part. Each of the tributaries of the major streams has its own small tributaries that branch into the uplands and form a well defined trellis pattern.

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 from which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils 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 a considerable degree of 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, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. 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 are generally collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot 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. In the detailed soil map units, these latter soils are called inclusions or included soils.

In the general soil map units, they are called soils of minor extent.

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 soils 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 broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units 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 a building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The soils in the survey area vary widely in their suitability for major land uses. In this section each map unit is described in terms of the visual elements of landform, water, vegetation or land use, and structures. The units are classified as having a low or moderate degree of visual diversity. This is a value rating of landscape elements and their pattern within a frame of reference developed for a local geographic area. Visual diversity can be used in conservation planning and in establishing a desirable continuity of landscape elements. The extent of the units and their components are identified and described. The main management concerns and the soil properties that limit use are indicated. Suitability or the degree of limitation are given for the common uses.

Descriptions of the Soils in Johnson County

Nearly Level Soils on Flood Plains

These soils are poorly drained. Slope is 0 to 2 percent. The soils have a brownish, loamy surface layer and grayish, sandy or loamy underlying layers.

1. Herod-Muckalee

Poorly drained soils that are loamy throughout or that have a loamy surface layer and predominantly sandy underlying layers

These nearly level soils are on the flood plains along the major streams or rivers. They are frequently flooded from late fall to mid spring. The flood plains are about one-quarter to one-half mile wide. Slope is 0 to 2 percent. The drainage pattern is well defined. Most of the natural watercourses are perennial. Most areas support sweetgum, blackgum, cypress, bay, poplar, and water oak. Other than roads and utility lines, there is little manmade development. The degree of visual diversity is low.

This unit makes up about 4 percent of Johnson County. It is about 40 percent Herod soils, 35 percent Muckalee soils, and 25 percent minor soils.

Typically, the surface layer of the Herod soils is sandy loam 9 inches thick. The upper part is dark grayish brown, and the lower part is gray. The next layer extends to a depth of 42 inches. It is gray sandy clay loam that has brownish yellow mottles. Below this to a depth of 65 inches or more is gray, stratified sandy loam and loamy sand.

Typically, the surface layer of the Muckalee soils is very dark grayish brown sandy loam 5 inches thick. The underlying layers to a depth of 65 inches or more are stratified loamy sand and sandy loam. These layers are gray and have yellowish brown and yellow mottles.

The minor soils in this unit are chiefly the Ochlockonee, Pelham, and Rains soils. The well drained Ochlockonee soils commonly are on narrow flood plains near the smaller tributaries that branch from the upper end of the flood plains. The poorly drained Pelham and Rains soils commonly are on smooth, low-lying uplands.

The major soils are well suited to the trees commonly grown in the survey area. They are unsuited to field crops, hay, and pasture. They are severely limited as sites for nonfarm uses. The main management concerns are wetness and flooding.

Nearly Level to Moderately Steep Soils on Ridgetops and Hillsides in the Uplands

These soils are well drained to excessively drained.

Slope is 0 to 17 percent. The soils have a brownish, loamy or sandy surface layer and a reddish or brownish, sandy, loamy, or clayey subsoil or underlying layer. The soils that have a predominantly brownish subsoil are mottled in the middle part, the lower part, or both.

2. Orangeburg-Faceville

Well drained soils that have a sandy or loamy surface layer and a loamy or clayey subsoil

These nearly level to moderately steep soils are on smooth and convex ridgetops and irregular hillsides. Slope is 0 to 17 percent. Excess surface water drains into a system of intermittent and perennial streams. There are few areas of open water. The soils are used mainly for field crops, hay, or pasture, but many areas are wooded. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is moderate.

This unit makes up about 9 percent of Johnson County. It is about 53 percent Orangeburg soils, 22 percent Faceville soils, and 25 percent minor soils.

Typically, the surface layer of the Orangeburg soils is dark grayish brown loamy sand 6 inches thick or brown sandy loam 5 inches thick. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish red, and the lower part is red.

Typically, the surface layer of the Faceville soils is brown sandy loam 5 inches thick. The subsoil to a depth of 65 inches or more is predominantly red sandy clay loam and sandy clay.

The minor soils in this unit are chiefly the Americus, Greenville, Herod, Lucy, and Muckalee soils. The somewhat excessively drained Americus and well drained Greenville and Lucy soils are on the same landscape as the major soils. The poorly drained Herod and Muckalee soils are on flood plains.

The main management concern is controlling erosion on the very gently sloping to moderately steep soils. The soils on ridgetops and the gently sloping soils on hillsides are well suited to most nonfarm uses. The more sloping soils on hillsides are somewhat limited because of the slope.

3. Dothan-Fuquay-Tifton

Well drained soils that have a sandy or loamy surface layer and a loamy subsoil or that have a sandy surface layer and subsurface layer and a loamy subsoil

These nearly level to gently sloping soils are mainly on smooth and convex ridgetops and irregular hillsides. Slope is 0 to 8 percent. Excess surface water drains into a system of intermittent and perennial streams. There are a few manmade ponds. The soils are used mainly for field crops, hay, or pasture, but many areas are wooded. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is moderate.

This unit makes up about 40 percent of Johnson County. It is about 30 percent Dothan soils, 28 percent Fuquay soils, 10 percent Tifton soils, and 32 percent minor soils.

Dothan soils have less than 5 percent nodules of ironstone in the surface layer and in the upper part of the subsoil. Typically, the surface layer is dark grayish brown loamy sand or sandy loam 6 inches thick. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish brown, the next part is yellowish brown and has strong brown and yellowish red mottles, and the lower part is mottled yellowish brown, yellow, red, and light gray. The content of plinthite is 5 percent or more below a depth of 30 inches. A few nodules of ironstone are on the surface and in the upper part of the profile.

Typically, the surface layer of the Fuquay soils is grayish brown loamy sand 5 inches thick. The subsurface layer is light yellowish brown loamy sand. It extends to a depth of 24 inches. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish brown, and the lower part is strong brown and has yellowish red and light gray mottles. The content of plinthite is 5 percent or more below a depth of about 37 inches.

Tifton soils have 5 percent or more nodules of ironstone in the surface layer and in the upper part of the subsoil. Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish brown, the next part is yellowish brown and has red mottles, and the lower part is mottled yellowish brown, red, and light gray. The content of plinthite is 5 percent or more below a depth of about 36 inches.

The minor soils in this unit are chiefly the Carnegie, Clarendon, Cowarts, Herod, Marlboro, Muckalee, and Nankin soils. The poorly drained Herod and Muckalee soils are on flood plains. The moderately well drained Clarendon soils are in smooth areas on uplands. Carnegie, Cowarts, Marlboro, and Nankin soils are on the same landscape as the major soils. Carnegie, Marlboro, and Nankin soils have a predominantly clayey subsoil. Cowarts and Nankin soils have a solum that is thinner than that of the major soils.

The major soils are well suited to most uses. A low available water capacity, however, limits the suitability

for farm uses in areas where the soils have a sandy surface layer and a thick subsurface layer. Erosion also is a management concern on the very gently sloping and gently sloping soils that have a sandy or loamy surface layer.

4. Nankin-Cowarts-Troup

Well drained soils that have a sandy or loamy surface layer and a loamy or clayey subsoil or that have a sandy surface layer and subsurface layer and a loamy subsoil

These nearly level to moderately steep soils are mainly on irregular and convex ridgetops and on hillsides, which are commonly irregular. Slope is 0 to 15 percent. Excess surface water drains into a system of intermittent and perennial streams. There are a few manmade ponds. The soils are used mainly as woodland, but some large areas are used for field crops, hay, or pasture. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is moderate.

This unit makes up about 44 percent of Johnson County. It is about 39 percent Nankin soils, 20 percent Cowarts soils, 10 percent Troup soils, and 31 percent minor soils.

Typically, the surface layer of the Nankin soils is dark grayish brown loamy sand 7 inches thick or dark brown sandy loam 5 inches thick. The subsoil extends to a depth of 42 inches. The upper part is strong brown sandy clay, and the lower part is strong brown sandy clay loam that has red mottles. The substratum to a depth of 65 inches or more is mottled yellowish brown, red, and light gray sandy clay loam.

Typically, the surface layer of the Cowarts soils is dark grayish brown loamy sand 6 inches thick or dark brown sandy loam 4 inches thick. The subsoil is predominantly sandy clay loam. It extends to a depth of 27 inches. It is dominantly yellowish brown throughout, but the lower part has red and strong brown mottles. The substratum to a depth of 65 inches or more is mottled yellowish brown, red, light gray, and brownish yellow, hard and firm sandy clay loam. A few nodules of ironstone are throughout the profile.

Typically, the surface layer of the Troup soils is dark grayish brown sand 3 inches thick. The subsurface layer extends to a depth of 72 inches. The upper part is yellowish brown sand, the next part is brownish yellow sand, and the lower part is brownish yellow sand that has thin strata of strong brown sandy loam and light yellowish brown sand. The subsoil to a depth of 98 inches or more is yellowish red sandy loam.

The minor soils in this unit are chiefly the Ailey, Herod, Muckalee, and Susquehanna soils. Ailey soils are on the same landscape as the major soils. They are sandy in the surface layer and in the subsurface layer, which extends to a depth of 22 to 30 inches. The poorly drained Herod and Muckalee soils are on flood plains. The somewhat poorly drained Susquehanna soils are on very gently sloping ridgetops and short, gently sloping and strongly sloping hillsides.

The suitability for farm uses is limited by a low available water capacity in the soils that have a sandy surface layer and a thick subsurface layer. Erosion also is a management concern on the soils that have a sandy or loamy surface layer. The soils on ridgetops and the gently sloping soils on hillsides are well suited to most nonfarm uses. Restricted permeability, however, is a limitation in many areas. Also, the more sloping soils on hillsides are limited because of the slope.

5. Lakeland-Americus

Excessively drained soils that are sandy throughout and somewhat excessively drained soils that have a sandy surface layer and a sandy or loamy subsoil

These nearly level to moderately steep soils are mainly on smooth and convex ridgetops. Slope is 0 to 15 percent. Excess surface water drains into a system of intermittent and perennial streams. There are few areas of open water. The soils are used mainly as woodland, but some large areas are used for field crops, hay, or pasture. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is moderate.

This unit makes up about 1 percent of Johnson County. It is about 75 percent Lakeland soils, 20 percent Americus soils, and 5 percent minor soils.

Typically, the surface layer of the Lakeland soils is very dark grayish brown sand 4 inches thick. The underlying layers to a depth of 85 inches or more are yellowish brown sand.

Typically, the surface layer of the Americus soils is dark reddish brown loamy sand 6 inches thick. The subsoil extends to a depth of 75 inches or more. The upper part is dark reddish brown loamy sand, the next part is dark red loamy sand, and the lower part is dark red sandy loam.

The minor soils in this unit are chiefly the well drained Greenville, Orangeburg, and Red Bay soils. These soils are on the same landscape as the major soils. They have a higher available water capacity than the major soils.

The main management concern is a low available water capacity, which limits the suitability for farm uses. The major soils are well suited to most nonfarm uses.

Seepage is a limitation, however, on sites for most sanitary facilities, and the more sloping soils are somewhat limited because of the slope.

6. Lakeland-Troup

Excessively drained soils that are sandy throughout and well drained soils that have a sandy surface layer and subsurface layer and a loamy subsoil

These nearly level to moderately steep soils are mainly on smooth and convex ridgetops and hillsides. Slope is 0 to 15 percent. Excess surface water drains into a system of perennial streams. The soils are used mainly as woodland, but some small areas are used for field crops, hay, or pasture. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is low.

This unit makes up about 2 percent of Johnson County. It is about 80 percent Lakeland soils, 6 percent Troup soils, and 14 percent minor soils.

Typically, the surface layer of the Lakeland soils is very dark grayish brown sand 4 inches thick. The underlying layers to a depth of 85 inches or more are yellowish brown sand.

Typically, the surface layer of the Troup soils is dark grayish brown sand 3 inches thick. The subsurface layer extends to a depth of 72 inches. The upper part is yellowish brown sand, the next part is brownish yellow sand, and the lower part is brownish yellow sand that has thin strata of strong brown sandy loam and light yellowish brown sand. The subsoil to a depth of 98 inches or more is yellowish red sandy loam.

The minor soils in this unit are the Herod, Muckalee, and Ocilla soils. The poorly drained Herod and Muckalee soils are on flood plains. The somewhat poorly drained Ocilla soils are in broad, smooth, slightly depressional areas on uplands.

The main management concern is a low available water capacity, which limits the suitability for farm uses. The very gently sloping and gently sloping soils are well suited to most nonfarm uses. Seepage is a limitation, however, on sites for most sanitary facilities, and the more sloping soils are somewhat limited because of the slope.

Descriptions of the Soils in Laurens County

Nearly Level Soils on Flood Plains

These soils are poorly drained to well drained. Slope is 0 to 2 percent. The soils generally have a brownish, loamy surface layer and a grayish or brownish, sandy, loamy, or clayey subsoil or underlying layer.

1. Tawcaw-Chastain-Congaree

Poorly drained to well drained soils that have a loamy or clayey surface layer and a loamy or clayey subsoil or underlying layer

These nearly level soils are in areas about 0.5 mile to 2.0 miles wide on the flood plains along the major rivers. They are frequently flooded from late fall to mid spring. The somewhat poorly drained Tawcaw soils commonly are in areas between the poorly drained Chastain soils in sloughs and the well drained Conagree soils on natural levees. Slope is 0 to 2 percent. The drainage pattern is well defined. Most of the natural watercourses are perennial. Most areas support sweetgum, blackgum, cypress, bay, poplar, and water oak. There are few manmade features. The degree of visual diversity is low.

This unit makes up about 4 percent of Laurens County. It is about 50 percent Tawcaw soils, 35 percent Chastain soils, 12 percent Congaree soils, and 3 percent minor soils.

Tawcaw soils are somewhat poorly drained. Typically, the surface layer is reddish brown silty clay loam 7 inches thick. The subsoil to a depth of 65 inches or more is predominantly silty clay. The upper part is mainly brown and dark brown, the next part is light gray and has brown mottles, and the lower part is mottled pale brown, yellowish brown, and light gray.

Chastain soils are poorly drained. Typically, the surface layer is dark brown silty clay 5 inches thick. The subsoil extends to a depth of 49 inches. The upper part is dark yellowish brown silty clay loam that has light brownish gray mottles, the next part is light brownish gray silty clay loam that has strong brown mottles, and the lower part is light brownish gray clay loam that has strong brown and yellowish red mottles. The substratum to a depth of 79 inches or more is stratified sand, sandy loam, and clay. It is light brownish gray, yellowish brown, and brownish yellow.

Congaree soils are well drained or moderately well drained. Typically, the surface layer is reddish brown loam 6 inches thick. The underlying layers to a depth of 65 inches or more are stratified loam, silt loam, fine sandy loam, and loamy sand. They are dark brown, reddish brown, and yellowish brown and have brownish mottles.

The minor soils in this unit are chiefly the Herod and Muckalee soils. These soils are poorly drained and are mainly in positions on the flood plains similar to those of the Chastain soils. They are more sandy or more loamy throughout than the Chastain soils.

The major soils are well suited to the trees commonly grown in the survey area. Most of the soils are unsuited

to field crops, hay, and pasture. They are severely limited as sites for nonfarm uses. The main management concerns are wetness and flooding.

2. Herod-Muckalee

Poorly drained soils that are loamy throughout or that have a loamy surface layer and predominantly sandy underlying layers

These nearly level soils are on the flood plains along the major streams. They are frequently flooded from late fall to mid spring. The flood plains are about one-quarter to one-half mile wide. Slope is 0 to 2 percent. The drainage pattern is well defined. Most of the natural watercourses are perennial. Most areas support sweetgum, blackgum, cypress, bay, poplar, and water oak. Other than roads and utility lines, there is little manmade development. The degree of visual diversity is low.

This unit makes up about 2 percent of Laurens County. It is about 60 percent Herod soils, 34 percent Muckalee soils, and 6 percent minor soils.

Typically, the surface layer of the Herod soils is sandy loam 9 inches thick. The upper part is dark grayish brown, and the lower part is gray. The next layer extends to a depth of 42 inches. It is gray sandy clay loam that has brownish yellow mottles. Below this to a depth of 65 inches or more is gray sandy loam stratified with loamy sand.

Typically, the surface layer of the Muckalee soils is very dark grayish brown sandy loam 5 inches thick. The underlying layers are stratified loamy sand and sandy loam. They extend to a depth of 65 inches or more. They are gray and have yellowish brown and yellow mottles.

The minor soils in this unit are chiefly the Ochlockonee, Pelham, and Rains soils. The well drained Ochlockonee soils commonly are on narrow flood plains near the smaller tributaries that branch from the upper end of the flood plains. The poorly drained Pelham and Rains soils are commonly on smooth, low-lying uplands.

The major soils are well suited to the trees commonly grown in the survey area. They are unsuited to field crops, hay, and pasture. They are severely limited as sites for nonfarm uses. The main management concerns are wetness and flooding.

Nearly Level to Moderately Steep Soils on Ridgetops and Hillsides in the Uplands

These soils are dominantly well drained. Slope is 0 to 17 percent. The soils have a brownish, loamy or sandy surface layer and a reddish or brownish, sandy, loamy, or clayey subsoil or underlying layer. The soils that have a dominantly brownish subsoil are mottled in the middle part, the lower part, or both.

3. Orangeburg-Faceville

Well drained soils that have a sandy or loamy surface layer and a loamy or clayey subsoil

These nearly level to moderately steep soils are on smooth and convex ridgetops and irregular hillsides. Slope is 0 to 17 percent. Excess surface water drains into a system of intermittent and perennial streams. There are few areas of open water. The soils are used mainly for field crops, hay, or pasture, but many areas are wooded. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is moderate.

This unit makes up about 15 percent of Laurens County. It is about 46 percent Orangeburg soils, 18 percent Faceville soils, and 36 percent minor soils.

Typically, the surface layer of the Orangeburg soils is dark grayish brown loamy sand 6 inches thick or brown sandy loam 5 inches thick. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish red, and the lower part is red.

Typically, the surface layer of the Faceville soils is brown sandy loam 5 inches thick. The subsoil to a depth of 65 inches or more is predominantly red sandy clay loam and sandy clay.

The minor soils in this unit are chiefly the Americus, Greenville, Herod, Lucy, and Muckalee soils. The somewhat excessively drained Americus and well drained Greenville and Lucy soils are on the same landscape as the major soils. The poorly drained Herod and Muckalee soils are on flood plains.

The main management concern is controlling erosion on the very gently sloping to moderately steep soils. The soils on ridgetops and the gently sloping soils on hillsides are well suited to most nonfarm uses. The more sloping soils on hillsides are somewhat limited because of the slope.

4. Tifton-Dothan-Fuquay

Well drained soils that have a sandy or loamy surface layer and a loamy subsoil or that have a sandy surface layer and subsurface layer and a loamy subsoil

These nearly level to gently sloping soils are mainly on smooth and convex ridgetops and irregular hillsides. Slope is 0 to 8 percent. Excess surface water drains into a system of intermittent and perennial streams. There are a few manmade ponds. The soils are used mainly for field crops, hay, or pasture, but many areas

are wooded. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is moderate.

This unit makes up about 52 percent of Laurens County. It is about 22 percent Tifton soils, 18 percent Dothan soils, 16 percent Fuquay soils, and 44 percent minor soils.

Tifton soils have 5 percent or more nodules of ironstone in the surface layer and in the upper part of the subsoil. Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish brown, the next part is yellowish brown and has red mottles, and the lower part is mottled yellowish brown, red, and light gray. The content of plinthite is 5 percent or more below a depth of about 36 inches.

Dothan soils have less than 5 percent nodules of ironstone in the surface layer and in the upper part of the subsoil. Typically, the surface layer is dark grayish brown loamy sand or sandy loam 6 inches thick. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish brown, the next part is yellowish brown and has strong brown and yellowish red mottles, and the lower part is mottled yellowish brown, yellow, red, and light gray. The content of plinthite is 5 percent or more below a depth of 30 inches.

Typically, the surface layer of the Fuquay soils is grayish brown loamy sand 5 inches thick. The subsurface layer is light yellowish brown loamy sand. It extends to a depth of 24 inches. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish brown, and the lower part is strong brown and has yellowish red and light gray mottles. The content of plinthite is 5 percent or more below a depth of about 37 inches.

The minor soils in this unit are chiefly the Carnegie, Clarendon, Cowarts, Herod, Marlboro, Muckalee, Nankin, Rains, and Troup soils. The poorly drained Herod and Muckalee soils are on flood plains. The moderately well drained Clarendon soils are in smooth areas on uplands. Carnegie, Cowarts, Marlboro, Nankin, and Troup soils are on the same landscape as the major soils. Carnegie, Marlboro, and Nankin soils have a predominantly clayey subsoil. Cowarts and Nankin soils have a solum that is thinner than that of the major soils. Troup soils are sandy in the surface layer and in the subsurface layer, which extends to a depth of 42 to 72 inches. The poorly drained Rains soils are in slight depressions and on smooth uplands.

The major soils are well suited to most uses. A low available water capacity, however, limits the suitability for farm uses in areas where the soils have a sandy surface layer and a thick subsurface layer. Erosion also is a management concern on the very gently sloping and gently sloping soils that have a sandy or loamy surface layer.

5. Nankin-Cowarts-Dothan

Well drained soils that have a sandy or loamy surface layer and a loamy or clayey subsoil

These nearly level to moderately steep soils are mainly on irregular and convex ridgetops and on hillsides, which are commonly irregular. Slope is 0 to 15 percent. Excess surface water drains into a system of intermittent and perennial streams. There are a few manmade ponds. The soils are used mainly as woodland, but some large areas are used for field crops, hay, or pasture. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is moderate.

This unit makes up about 13 percent of Laurens County. It is about 35 percent Nankin soils, 30 percent Cowarts soils, 10 percent Dothan soils, and 25 percent minor soils.

Typically, the surface layer of the Nankin soils is dark grayish brown loamy sand 7 inches thick or dark brown sandy loam 5 inches thick. The subsoil extends to a depth of 42 inches. The upper part is strong brown sandy clay, and the lower part is strong brown sandy clay loam that has red mottles. The substratum to a depth of 65 inches or more is mottled yellowish brown, red, and light gray sandy clay loam.

Typically, the surface layer of the Cowarts soils is dark grayish brown loamy sand 6 inches thick or dark brown sandy loam 4 inches thick. The subsoil is predominantly sandy clay loam. It extends to a depth of 27 inches. It is dominantly yellowish brown throughout, but the lower part has red and strong brown mottles. The substratum to a depth of 65 inches or more is mottled yellowish brown, red, light gray, and brownish yellow, hard and firm sandy clay loam. A few nodules of ironstone are throughout the profile.

Dothan soils have less than 5 percent nodules of ironstone in the surface layer and in the upper part of the subsoil. Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish brown, the next part is yellowish brown and has strong brown and yellowish red mottles, and the lower part is mottled yellowish brown, yellow, red, and light gray. The content of plinthite is 5 percent or more below a depth of 30 inches.

The minor soils in this unit are chiefly the Ailey, Herod, Muckalee, and Susquehanna soils. Ailey soils

are on the same landscape as the major soils. They are sandy in the surface layer and in the subsurface layer, which extends to a depth of 22 to 30 inches. The poorly drained Herod and Muckalee soils are on flood plains. The somewhat poorly drained Susquehanna soils are on very gently sloping ridgetops and short, gently sloping and strongly sloping hillsides.

The main management concern is controlling erosion. The soils on ridgetops and the gently sloping soils on hillsides are well suited to most nonfarm uses. Moderately slow or slow permeability, however, is a limitation in many areas. Also, the more sloping soils on hillsides are limited because of the slope.

6. Nankin-Ailey-Fuquay

Well drained soils that have a sandy or loamy surface layer and a clayey subsoil or that have a sandy surface layer and subsurface layer and a loamy subsoil

These nearly level to gently sloping soils are mainly on smooth and convex ridgetops and hillsides. Slope is 0 to 8 percent. Excess surface water drains into a system of intermittent and perennial streams. There are a few manmade ponds. The soils are used mainly as woodland, but some large areas are used for field crops, hay, or pasture. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is moderate.

This unit makes up about 11 percent of Laurens County. It is about 30 percent Nankin soils, 21 percent Ailey soils, 19 percent Fuquay soils, and 30 percent minor soils.

Typically, the surface layer of the Nankin soils is dark grayish brown loamy sand 7 inches thick or dark brown sandy loam 5 inches thick. The subsoil extends to a depth of 42 inches. The upper part is strong brown sandy clay, and the lower part is strong brown sandy clay loam that has red mottles. The substratum a depth of 65 inches or more is mottled yellowish brown, red, and light gray, hard and firm sandy clay loam.

Typically, the surface layer of the Ailey soils is dark grayish brown loamy sand 7 inches thick. The subsurface layer is yellowish brown loamy sand. It extends to a depth of 28 inches. The subsoil is predominantly sandy clay loam. It extends to a depth of 46 inches. It is brittle between depths of 39 and 46 inches. The upper part is yellowish brown, and the lower part is yellowish brown and has red, pale brown, and strong brown mottles. The substratum to a depth of 65 inches or more is mottled yellowish brown, strong brown, red, and light gray sandy clay loam. It is compact in place and hard when dry.

Typically, the surface layer of the Fuquay soils is grayish brown loamy sand 5 inches thick. The subsurface layer is light yellowish brown loamy sand. It extends to a depth of 24 inches. The subsoil to a depth of 65 inches or more is predominantly sandy clay loam. The upper part is yellowish brown, and the lower part is strong brown and has yellowish red and light gray mottles. The content of plinthite is 5 percent or more below a depth of about 37 inches.

The minor soils in this unit are chiefly the Cowarts, Dothan, Herod, and Muckalee soils. Cowarts and Dothan soils are on the same landscape as the major soils. Cowarts and Dothan soils do not have a clayey subsoil, do not have a sandy surface layer and subsurface layer 22 to 35 inches thick, and do not have a brittle layer or a layer of plinthite in the subsoil. The poorly drained Herod and Muckalee soils are on flood plains.

The main management concerns are erosion on the soils that have a sandy or loamy surface layer and a low available water capacity in the soils that have a sandy surface layer and a thick subsurface layer. The soils on ridgetops and the gently sloping soils on hillsides are well suited to most nonfarm uses. Moderately slow or slow permeability, however, is a limitation in many areas.

7. Lakeland-Troup

Excessively drained soils that are sandy throughout and well drained soils that have a sandy surface layer and subsurface layer and a loamy subsoil

These nearly level to moderately steep soils are mainly on smooth and convex ridgetops and hillsides. Slope is 0 to 15 percent. Excess surface water drains into a system of perennial streams. The soils are used mainly as woodland, but some small areas are used for field crops, hay, or pasture. Roads, utility lines, fences, and farm homes and associated structures are common. The degree of visual diversity is low.

This unit makes up about 3 percent of Laurens County. It is about 49 percent Lakeland soils, 35 percent Troup soils, and 16 percent minor soils.

Typically, the surface layer of the Lakeland soils is very dark grayish brown sand 4 inches thick. The underlying layers to a depth of 85 inches or more are yellowish brown sand.

Typically, the surface layer of the Troup soils is dark grayish brown sand 3 inches thick. The subsurface layer extends to a depth of 72 inches. The upper part is yellowish brown sand, the next part is brownish yellow sand, and the lower part is brownish yellow sand that has thin strata of strong brown sandy loam and light yellowish brown sand. The subsoil to a depth of 98

inches or more is yellowish red sandy loam.

The minor soils in this unit are the Herod, Muckalee, and Ocilla soils. The poorly drained Herod and Muckalee soils are on flood plains. The somewhat poorly drained Ocilla soils are in broad, smooth, slightly depressional areas on uplands.

The main management concern is a low available water capacity, which limits the suitability for farm uses. The very gently sloping and gently sloping soils are well suited to most nonfarm uses. Seepage is a limitation, however, on sites for most sanitary facilities, and the more sloping soils are somewhat limited because of the slope.

Broad Land Use Considerations

A considerable acreage in the survey area is used as cropland, pasture, or woodland. In general, the soils in the survey area that are well suited to cultivated crops also are well suited to urban development. Their suitability for farming should not be overlooked in planning. The data about specific soils in this survey area can be helpful in planning future land use patterns. The general soil map can be used for broad planning, but it cannot be used to locate the site for a specific structure. Interpretations made from the general soil map are specific for each county. The following broad land use considerations, however, apply to the entire survey area.

Many of the soils on uplands in the survey area are used for cultivated crops, hay, or pasture. They are well suited to those uses. Most of the soils are nearly level to gently sloping and are well drained, but some are nearly level and moderately well drained. In some areas the soils are only moderately suited, poorly suited, or unsuited to farming because of a low available water capacity, a severe hazard of erosion, the slope, very slow to moderately slow permeability, or a seasonal high water table. Most of the soils on flood plains are poorly drained and are used as woodland. They are poorly suited to farming.

About 60 percent of the survey area is used as woodland. The potential productivity of the soils for woodland generally is moderate or high.

On about three-fourths of the acreage, the soils are on ridgetops and hillsides in the uplands. Most are well drained and are well suited to most nonfarm uses. On about 3 percent of this acreage, however, a high shrink-swell potential or the slope is a limitation and the soils are less well suited to nonfarm uses. The rest of the soils in the survey area are on flood plains, in upland depressions, and in smooth, nearly level areas on uplands and are seasonally wet. They are moderately suited or poorly suited to nonfarm uses.

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. A soil is well suited if it has properties that are favorable. A soil is moderately suited if it has properties that require special planning and management to obtain satisfactory performance. A soil is poorly suited if it has properties that are unfavorable. A soil is unsuited to cultivated crops if it has properties that are very unfavorable. 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 substratum, 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 substratum. They also can differ in slope, stoniness, 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, Tifton loamy sand, 2 to 5 percent slopes, is a phase of the Tifton series.

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

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Tawcaw-Chastain-Congaree association, frequently flooded, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Herod and Muckalee sandy loams, frequently flooded, is an undifferentiated group in this survey area.

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. The included soils are on the same landscape position with the named soil.

Table 4 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 suitabilities for many uses. The Glossary defines many of the terms used in describing the soils.

AeB—Ailey loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on the tops of ridges in the uplands. Slopes are smooth and convex. Areas are 10 to 250 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 7 inches thick. The subsurface layer is yellowish brown loamy sand 21 inches thick. The subsoil is dominantly sandy clay loam. It extends to a depth of 46 inches. It is brittle between depths of 39 and 46 inches. The upper part is yellowish brown, and the lower part is yellowish brown and has red, pale

brown, and strong brown mottles. The substratum to a depth of 65 inches or more is mottled yellowish brown, strong brown, red, and light gray sandy clay loam. It is compact in place and hard when dry.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is rapid in the upper sandy layers, moderate in the upper part of the subsoil, and slow in the rest of the subsoil and in the substratum. Available water capacity is low. Tilth is good. The soil can be worked throughout a wide range in moisture content. The effective root zone is limited by the brittle and cemented layer in the subsoil.

Included with this soil in mapping are a few small areas of Cowarts, Fuquay, and Lakeland soils.

The Ailey soil is only moderately suited to field crops, hay, and pasture because of the low available water capacity. Returning crop residue to the soil increases the available water capacity and helps to prevent excessive leaching of plant nutrients.

The potential productivity for slash pine and longleaf pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to most urban uses. The slow permeability in the lower part of the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures. Seepage is a limitation on sites for sewage lagoons. Because of the slow permeability in the lower part of the profile, the soil is only moderately suited to recreational development.

The capability subclass is IIIs, and the woodland ordination symbol is 8S.

AeC—Ailey loamy sand, 5 to 8 percent slopes. This well drained, gently sloping soil is on ridgetops and hillsides in the uplands. Slopes commonly are smooth and convex. Areas are 10 to 90 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 7 inches thick. The subsurface layer is yellowish brown loamy sand 21 inches thick. The subsoil is dominantly sandy clay loam. It extends to a depth of 46 inches. It is brittle between depths of 39 and 46 inches. The upper part is yellowish brown, and the lower part is yellowish brown and has red, pale brown, and strong brown mottles. The substratum to a depth of 65 inches or more is mottled yellowish brown, strong brown, red, and light gray sandy clay loam. It is compact in place and hard when dry.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is rapid in the upper sandy layers, moderate in the upper part of the subsoil, and slow in the rest of the subsoil and in the substratum. Available water capacity is low. Tilth is good. The soil can be worked throughout a wide range in moisture content. The effective root zone is limited by the brittle and cemented layer in the subsoil.

Included with this soil in mapping are a few small areas of Cowarts, Fuquay, and Lakeland soils.

The Ailey soil is poorly suited to field crops because of the low available water capacity. It is moderately suited to hay and pasture. Returning crop residue to the soil increases the available water capacity and helps to prevent excessive leaching of plant nutrients.

The potential productivity for slash pine and longleaf pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to most urban uses. The slow permeability in the lower part of the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures. Seepage is a limitation on sites for sewage lagoons. Because of the restricted permeability in the lower part of the profile, the soil is only moderately suited to recreational development.

The capability subclass is IVs, and the woodland ordination symbol is 8S.

AmB—Americus loamy sand, 2 to 5 percent slopes. This somewhat excessively drained, very gently sloping soil is on the broad tops of ridges in the uplands. Slopes are smooth and convex. Areas are 5 to 75 acres in size.

Typically, the surface layer is dark reddish brown loamy sand 6 inches thick. The subsoil extends to a depth of 75 inches or more. The upper part is dark reddish brown loamy sand, the next part is dark red loamy sand, and the lower part is dark red sandy loam.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderately rapid. Available water capacity is low. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are small areas of Lakeland, Lucy, Red Bay, and Troup soils.

The Americus soil is only moderately suited to field crops, hay, and pasture because of the low available water capacity. Returning crop residue to the soil conserves moisture. During dry periods crops respond favorably to irrigation.

The potential productivity for slash pine, loblolly pine, and longleaf pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to most urban uses, but seepage is a limitation on sites for most sanitary facilities. Because it is too sandy, the soil is only moderately suited to recreational development.

The capability subclass is IIIs, and the woodland ordination symbol is 11S.

AmC—Americus loamy sand, 5 to 8 percent slopes. This somewhat excessively drained, gently sloping soil is on ridgetops and short hillsides in the uplands. Slopes generally are smooth and convex. Areas are 5 to 30 acres in size.

Typically, the surface layer is dark reddish brown loamy sand 6 inches thick. The subsoil extends to a depth of 75 inches or more. The upper part is dark reddish brown loamy sand, the next part is dark red loamy sand, and the lower part is dark red sandy loam.

This soil is low in natural fertility and in content of organic matter. It is very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderately rapid. Available water capacity is low. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are small areas of Lakeland, Lucy, and Troup soils. Also included are soils on a few small areas where slopes are more than 8 percent.

The Americus soil is only moderately suited to field crops, hay, and pasture because of the low available water capacity. Returning crop residue to the soil conserves moisture and helps to prevent excessive leaching of plant nutrients.

The potential productivity for slash pine, loblolly pine, and longleaf pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to most urban uses, but seepage is a limitation on sites for most sanitary facilities. Because it is too sandy, the soil is only moderately suited to recreational development.

The capability subclass is IVs, and the woodland ordination symbol is 11S.

CaB2—Carnegie sandy loam, 2 to 5 percent slopes, eroded. This well drained, very gently sloping soil is on ridgetops and hillsides in the uplands. The landscape is undulating and has galled spots and gullies. Areas are 5 to 40 acres in size.

Typically, the surface layer is dark brown sandy loam 5 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay. The upper part is strong brown, the next part is strong brown and has red and light gray mottles, and the lower part is mottled strong brown, yellowish brown, red, and light gray. Nodules of ironstone are in the surface layer and throughout the upper and middle parts of the subsoil. The content of plinthite is 5 percent or more between depths of 18 and 52 inches.

This soil is low in natural fertility and moderately low in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderately slow in the subsoil. Available water capacity is moderate. Runoff is rapid. The effective root zone generally is limited to the upper 20 inches of the soil. The plinthite below this depth cannot be easily penetrated by plant roots.

Included with this soil in mapping are areas of Cowarts, Dothan, and Tifton soils.

The Carnegie soil is well suited to field crops, but the rapid runoff and the somewhat gullied landscape are management concerns. The soil is moderately suited to hay and pasture. Returning crop residue to the soil helps to maintain tilth. Erosion is a moderate hazard unless cultivated areas are protected. A conservation

tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses. The moderately slow permeability in the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures. The soil is only moderately suited to most kinds of recreational development because the subsoil is moderately slowly permeable.

The capability subclass is IIIe, and the woodland ordination symbol is 9A.

CaC2—Carnegie sandy loam, 5 to 8 percent slopes, eroded. This well drained, gently sloping soil is on narrow ridgetops and short hillsides in the uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places slopes are short and irregular and have galled spots and gullies. Areas are 10 to 30 acres in size.

Typically, the surface layer is dark brown sandy loam 5 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay. The upper part is strong brown, the next part is strong brown and has red and light yellowish brown mottles, and the lower part is mottled red, yellowish brown, strong brown, and light gray. Nodules of ironstone are in the surface layer and throughout the upper and middle parts of the subsoil. The content of plinthite is 5 percent or more between depths of 18 and 52 inches.

This soil is low in natural fertility and moderately low in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderately slow in the subsoil. Available water capacity is moderate. Runoff is rapid. The effective root zone generally is limited to the upper 20 inches of the soil. The plinthite below this depth cannot be easily penetrated by plant roots.

Included with this soil in mapping are areas of Cowarts, Dothan, and Tifton soils.

The Carnegie soil is only moderately suited to field crops, hay, and pasture because of the rapid runoff and the somewhat gullied landscape. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses. The moderately slow permeability in the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures. The soil is only moderately suited to most kinds of recreational development because the subsoil is moderately slowly permeable.

The capability subclass is IVe, and the woodland ordination symbol is 9A.

CnA—Clarendon loamy sand, 0 to 2 percent slopes. This moderately well drained, nearly level soil is in smooth areas on uplands. Areas are 5 to 30 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 7 inches thick. The subsurface layer is light yellowish brown loamy sand 5 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. It is brittle between depths of 20 and 48 inches. The upper few inches are light yellowish brown, the next part is yellowish brown and has red and light gray mottles, and the lower part is coarsely mottled yellowish brown and light gray.

This soil is low in natural fertility and low to moderate in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep. From late fall to early spring, however, the water table, which commonly is at a depth of 2 to 3 feet, somewhat limits the growth of some plants.

Included with this soil in mapping are small areas of Ocilla and Rains soils.

The Clarendon soil is well suited to field crops, hay, and pasture, but the wetness is a limitation. A drainage system is needed in most places.

The potential productivity for loblolly pine and slash pine is high on this soil. The seasonal wetness limits the use of conventional equipment. This limitation commonly can be overcome by using modified or special equipment or by operating the equipment only during the drier periods.

This soil is only moderately suited to most urban uses and to recreational development because of the wetness. Also, the moderately slow permeability in the lower part of the subsoil is a limitation on sites for

septic tank absorption fields. In most areas these limitations can be overcome by special design and installation procedures.

The capability subclass is IIw, and the woodland ordination symbol is 9W.

CoB—Cowarts loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on ridgetops and hillsides in the uplands. Slopes are irregular, undulating, and convex. Areas are 5 to 80 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil is dominantly sandy clay loam. It extends to a depth of 27 inches. It is dominantly yellowish brown throughout, but the lower part has red and strong brown mottles. The substratum to a depth of 65 inches or more is mottled yellowish brown, red, light gray, and brownish yellow, hard and firm sandy clay loam. A few nodules of ironstone are throughout the soil.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil and moderately slow or slow in the substratum. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The effective root zone generally is limited to the upper 22 to 34 inches of the soil. The hard and firm substratum cannot be easily penetrated by plant roots.

Included with this soil in mapping are areas of Carnegie, Dothan, and Nankin soils.

The Cowarts soil is well suited to field crops, hay, and pasture, but yields are somewhat reduced because the effective root zone is limited. Good tilth can be easily maintained by returning crop residue to the soil. Erosion is a moderate hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses. The moderately slow or slow permeability in the substratum is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures. The soil is only moderately suited to most kinds of recreational development because the substratum is moderately slowly or slowly permeable.

The capability subclass is IIe, and the woodland ordination symbol is 9A.

CtC2—Cowarts sandy loam, 5 to 8 percent slopes, eroded. This well drained, gently sloping soil is on narrow ridgetops and short hillsides in the uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places slopes are short and irregular and have galled spots and an occasional gully. Areas are 5 to 60 acres in size.

Typically, the surface layer is dark brown sandy loam 4 inches thick. The subsoil is mainly sandy clay loam. It extends to a depth of 27 inches. It is dominantly yellowish brown throughout, but it has strong brown and red mottles in the lower part. The substratum is hard and firm. The upper part is mottled yellowish brown, light gray, and red sandy clay loam, and the lower part to a depth of 60 inches or more is yellowish brown, red, and light gray sandy clay. A few nodules of ironstone are on the surface and in the surface layer.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil and moderately slow or slow in the substratum. Available water capacity is moderate. Runoff is rapid. The effective root zone generally is limited to the upper 22 to 34 inches of the soil. The hard and firm substratum cannot be easily penetrated by plant roots.

Included with this soil in mapping are small areas of Carnegie and Dothan soils. Also included are eroded soils that have a surface layer of sandy clay loam.

The Cowarts soil is only moderately suited to field crops, hay, and pasture because of the rapid runoff and the somewhat gullied, short and irregular slopes. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses. The moderately slow or slow permeability in the substratum is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures. The soil is only moderately suited to most kinds of recreational development because the substratum is moderately slowly or slowly permeable.

The capability subclass is IVe, and the woodland ordination symbol is 9A.

CtD2—Cowarts sandy loam, 8 to 15 percent slopes, eroded. This well drained, strongly sloping and moderately steep soil is on short hillsides in the uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places slopes are irregular and have galled spots and an occasional gully. Areas are 5 to 50 acres in size.

Typically, the surface layer is dark brown sandy loam 4 inches thick. The subsoil is mainly sandy clay loam. It extends to a depth of 27 inches. It is dominantly yellowish brown throughout, but it has strong brown and red mottles in the lower part. The substratum is hard and firm. The upper part is mottled yellowish brown, light gray, and red sandy clay loam. The lower part to a depth of 60 inches or more is yellowish brown, red, and light gray sandy clay. A few nodules of ironstone are on the surface and in the surface layer.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil and moderately slow or slow in the substratum. Available water capacity is moderate. Runoff is rapid. The effective root zone generally is limited to the upper 22 to 34 inches of the soil. The hard and firm substratum cannot be easily penetrated by plant roots.

Included with this soil in mapping are small areas of the less sloping Ailey, Carnegie, Nankin, and Troup soils. Also included are eroded soils that have a surface layer of sandy clay loam.

The Cowarts soil is unsuited to field crops because of the slope and the somewhat gullied landscape. It is moderately suited to hay and pasture. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard unless cultivated areas are protected.

Most areas are wooded. The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is only moderately suited to most urban uses and to recreational development, mainly because of the slope. Also, the moderately slow or slow permeability in the substratum is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures.

The capability subclass is VIe, and the woodland ordination symbol is 9A.

DoA—Dothan loamy sand, 0 to 2 percent slopes. This well drained, nearly level soil is on the tops of ridges in the uplands. Areas are 10 to 50 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish brown, the next part is yellowish brown and has strong brown and yellowish red mottles, and the lower part is mottled yellowish brown, yellow, red, and light gray. The content of plinthite is 5 percent or more below a depth of about 42 inches. A few nodules of ironstone are in the surface layer and in the upper part of the subsoil.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Fuquay and Tifton soils.

The Dothan soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. A conservation tillage system helps to maintain the content of organic matter and conserves moisture.

The potential productivity for slash pine and loblolly pine is high on this soil. No significant limitations affect woodland.

This soil is well suited to most urban uses and to recreational development. The moderately slow permeability in the lower part of the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures.

The capability class is I, and the woodland ordination symbol is 12A.

DoB—Dothan loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on ridgetops and hillsides in the uplands. Slopes are smooth and convex. Areas are 10 to 90 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish brown, the next part is yellowish brown and has strong brown and yellowish red mottles, and the lower part is mottled yellowish brown, yellow, red, and light gray. The content of plinthite is 5 percent or more below a depth of 30 inches. A few nodules of

Figure 2.—Improved bermudagrass in an area of Dothan loamy sand, 2 to 5 percent slopes. This soil is well suited to hay.

ironstone are in the surface layer and in the upper part of the subsoil.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Cowarts, Fuquay, Nankin, and Tifton soils.

The Dothan soil is well suited to field crops and to hay and pasture (fig. 2). During dry periods crops respond favorably to irrigation. Erosion is a moderate hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for slash pine and loblolly pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development. The moderately slow permeability in the lower part of the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures.

The capability subclass is IIe, and the woodland ordination symbol is 12A.

DtC2—Dothan sandy loam, 5 to 8 percent slopes, eroded. This well drained, gently sloping soil is on ridgetops and hillsides in the uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places slopes are irregular and have galled spots and an occasional gully. Areas are 5 to 20 acres in size.

Typically, the surface layer is dark grayish brown sandy loam 6 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is dominantly yellowish brown, the next part is strong brown and has yellowish red mottles, and the

lower part is mottled strong brown, yellowish brown, red, and light gray. The content of plinthite is 5 percent or more below a depth of about 38 inches.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Cowarts, Fuquay, Nankin, and Tifton soils.

The Dothan soil is well suited to field crops, hay, and pasture. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for slash pine and loblolly pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development. The moderately slow permeability in the lower part of the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures.

The capability subclass is IVe, and the woodland ordination symbol is 12A.

FaB—Faceville sandy loam, 2 to 5 percent slopes. This well drained, very gently sloping soil is on the broad tops of ridges in the uplands. Slopes are smooth and convex. Areas are 10 to 150 acres in size.

Typically, the surface layer is brown sandy loam 5 inches thick. The subsoil to a depth of 65 inches or more is red sandy clay loam and sandy clay.

This soil is low in natural fertility and low or moderately low in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. Tilth is good. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Greenville, Orangeburg, and Red Bay soils. Also included are a few small areas of soils that have a surface layer of sandy clay loam and areas where slopes are less than 2 percent.

The Faceville soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. Good tilth can be easily maintained by returning crop residue to the soil. Erosion is a moderate hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity of loblolly pine and slash pine is moderate on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development. The clayey subsoil limits a few uses.

The capability subclass is IIe, and the woodland ordination symbol is 8A.

FaC2—Faceville sandy loam, 5 to 10 percent slopes, eroded. This well drained, gently sloping and strongly sloping soil is on hillsides in the uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places slopes are convex and have galled spots and an occasional gully. Areas are 10 to 50 acres in size.

Typically, the surface layer is yellowish red sandy loam 4 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay. The upper part is yellowish red, the next part is red, and the lower part is red and has strong brown and yellowish brown mottles.

This soil is low in natural fertility and low or moderately low in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Greenville and Orangeburg soils. Also included are a few small areas of soils that have a surface layer of sandy clay loam.

The Faceville soil is only moderately suited to field crops because of the slope and the somewhat gullied landscape. It is well suited to hay and pasture. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is moderate on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development. The clayey subsoil limits a few uses.

The capability subclass is IIIe, and the woodland ordination symbol is 8A.

FuB—Fuquay loamy sand, 0 to 5 percent slopes. This well drained, nearly level and very gently sloping soil is on the broad tops of ridges in the uplands. Slopes are smooth and convex. Areas are 10 to 60 acres in size.

Typically, the surface layer is grayish brown loamy sand 5 inches thick. The subsurface layer is light yellowish brown loamy sand. It extends to a depth of 24 inches. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish brown, and the lower part is strong brown and has yellowish red and light gray mottles. The content of plinthite is 5 percent or more below a depth of about 37 inches.

This soil is low in natural fertility and low or moderately low in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderately rapid in the upper sandy layers, moderate in the upper part of the subsoil, and slow in the rest of the subsoil. Available water capacity is low. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Ailey, Dothan, Lakeland, and Troup soils.

The Fuquay soil is only moderately suited to field crops, hay, and pasture because of the low available water capacity. Returning crop residue to the soil helps overcome the low available water capacity. During dry periods crops respond favorably to irrigation.

The potential productivity for loblolly pine, longleaf pine, and slash pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to most urban uses. The slow permeability in the lower part of the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures. Because it is too sandy, the soil is only moderately suited to recreational development.

The capability subclass is IIs, and the woodland ordination symbol is 8S.

FuC—Fuquay loamy sand, 5 to 8 percent slopes. This well drained, gently sloping soil is on ridgetops and hillsides in the uplands. Slopes commonly are smooth and convex. Areas are 5 to 20 acres in size.

Typically, the surface layer is grayish brown loamy sand 5 inches thick. The subsurface layer is light yellowish brown loamy sand. It extends to a depth of 24 inches. The subsoil to a depth of 65 inches or more is sandy clay loam. The upper part is yellowish brown, and the lower part is strong brown and has yellowish red and light gray mottles. The content of plinthite is 5 percent or more below a depth of about 37 inches.

This soil is low in natural fertility and low or moderately low in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderately rapid in the upper sandy layers, moderate in the upper part of the subsoil, and slow in the rest of the subsoil. Available water capacity is low. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are small areas of Ailey, Dothan, and Troup soils.

The Fuquay soil is only moderately suited to field crops, hay, and pasture because of the low available water capacity and the slope. Returning crop residue to the soil increases the available water capacity.

The potential productivity for loblolly pine, longleaf pine, and slash pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to most urban uses. The slow permeability in the lower part of the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures. Because it is too sandy, the soil is only moderately suited to most kinds of recreational development.

The capability subclass is IIIs, and the woodland ordination symbol is 8S.

Gr—Grady loam, ponded. This poorly drained, nearly level soil is in saucer-shaped depressions on uplands. It is ponded from winter to early summer. Slopes are 0 to 2 percent. Areas are 5 to 35 acres in size.

Typically, the surface layer is very dark gray loam 5 inches thick. The subsoil to a depth of 65 inches or more is dominantly gray clay. It has yellowish brown mottles in the lower part.

This soil is low in natural fertility and low to moderate in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability is slow in the subsoil. Available water capacity is moderate. The root zone usually is deep, but it is limited from winter to early summer, when the soil is ponded or the water table is near the surface.

Included with this soil in mapping are small areas of Rains soils.

The Grady soil generally is wooded. Blackgum, baldcypress, water oak, and water tupelo are the more common trees. Some areas are dominated by water-tolerant shrubs and grasses. Ponding is the main hazard. It limits the use of equipment and the survival of plants other than the common water-tolerant trees.

This soil is unsuited to field crops, hay, pasture, urban uses, and recreational development because of the ponding. Unless outlets are available for drainage, overcoming this hazard is difficult.

The capability subclass is Vw, and the woodland ordination symbol is 4W.

GsA—Greenville sandy loam, 0 to 2 percent slopes. This well drained, nearly level soil is on the broad tops of ridges in the uplands. It is mainly in one area about 270 acres in size.

Typically, the surface layer is dark reddish brown sandy loam 6 inches thick. The subsoil extends to a depth of 65 inches or more. The upper few inches are dark reddish brown sandy clay loam, and the rest of the subsoil is dark red sandy clay.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. Tilth is good. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Faceville, Orangeburg, and Red Bay soils. Also included are a few small areas of soils that have a surface layer of sandy clay loam.

The Greenville soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. Good tilth can be easily maintained by returning crop residue to the soil. A conservation tillage system conserves moisture and helps to maintain the content of organic matter.

The potential productivity for loblolly pine and slash pine is moderate on this soil. No significant limitations affect woodland.

This soil is well suited to most urban uses and to recreational development. The clayey subsoil limits a few uses.

The capability class is I, and the woodland ordination symbol is 8A.

GsB—Greenville sandy loam, 2 to 5 percent slopes. This well drained, very gently sloping soil is on the broad tops of ridges in the uplands. Slopes are smooth and convex. Areas are 10 to 125 acres in size.

Typically, the surface layer is dark reddish brown sandy loam 6 inches thick. The subsoil extends to a depth of 65 inches or more. The upper few inches are dark reddish brown sandy clay loam, and the rest of the subsoil is dark red sandy clay.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. Tilth is good. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Faceville, Orangeburg, and Red Bay soils. Also included are a few small areas of soils that have a surface layer of sandy clay loam.

The Greenville soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. Good tilth can be easily maintained by returning crop residue to the soil. Erosion is a moderate hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is moderate on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development. The clayey subsoil limits a few uses.

The capability subclass is IIe, and the woodland ordination symbol is 8A.

GsC—Greenville sandy loam, 5 to 10 percent slopes. This well drained, gently sloping and strongly sloping soil is dominantly on hillsides in the uplands. In most places slopes are convex and have an occasional

gully. Areas are 10 to 50 acres in size.

Typically, the surface layer is dark reddish brown sandy loam 6 inches thick. The subsoil extends to a depth of 65 inches or more. The upper few inches are reddish brown sandy clay loam, and the rest of the subsoil is dark red sandy clay.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Faceville, Orangeburg, and Red Bay soils. Also included are a few small areas of soils that have a surface layer of sandy clay loam.

The Greenville soil is only moderately suited to field crops because of the slope. It is well suited to hay and pasture. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is moderate on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development. The clayey subsoil limits a few uses.

The capability subclass is IIIe, and the woodland ordination symbol is 8A.

HM—Herod and Muckalee sandy loams, frequently flooded. These poorly drained, nearly level soils are on flood plains. They are frequently flooded from late fall to mid spring. They occur in an irregular pattern on the landscape. Individual areas of each soil are large enough to be mapped separately. Because of present and predicted land uses, however, the two soils were mapped as one unit. Most areas are made up of both soils, but some have only one of the soils. Areas are 50 to 1,200 acres in size. Slopes are 0 to 2 percent.

The Herod soil makes up about 65 percent of the map unit. Typically, the surface layer is sandy loam 9 inches thick. The upper part is dark grayish brown, and the lower part is gray. The underlying layer to a depth of 42 inches is gray sandy clay loam that has brownish yellow mottles. Below this to a depth of 65 inches or more is gray, stratified sandy loam and loamy sand.

The Herod soil is low in natural fertility and moderate in content of organic matter. It is strongly acid in the surface layer and medium acid or slightly acid in the rest of the profile. Permeability is moderate in the underlying material. Available water capacity is moderate. The root zone usually is deep, but it is limited from early winter to early spring, when the water table is at a depth of 0.5 foot to 1.5 feet or when the soil is flooded for brief periods.

The Muckalee soil makes up about 20 percent of the map unit. Typically, the surface layer is very dark grayish brown sandy loam 5 inches thick. The underlying layers are stratified loamy sand and sandy loam that extend to a depth of 65 inches or more. These layers are gray and have yellowish brown and yellow mottles.

The Muckalee soil is low in natural fertility and moderately low in content of organic matter. It is strongly acid in the surface layer and medium acid or slightly acid in the rest of the profile. Permeability is moderate in the underlying material. Available water capacity is moderate. The root zone usually is deep, but it is limited from early winter to early spring, when the water table commonly is at a depth of 0.5 foot to 1.5 feet or when the soil is flooded for brief periods.

Included with these soils in mapping are a few areas of Chastain soils. Also included are soils that are better drained than the Herod and Muckalee soils.

Most areas of the Herod and Muckalee soils support native sweetgum, water tupelo, cypress, and bay. The potential productivity for native trees and for loblolly pine and slash pine is high on these soils. The seasonal wetness limits the use of conventional equipment and increases the seedling mortality rate. The equipment limitation commonly can be overcome by using modified equipment or by operating the equipment only during the drier periods. Drainage measures, a bedding system, control of competing plants, and selection of suitable species for planting commonly increase the seedling survival rate.

These soils are unsuited to field crops, hay, pasture, and recreational development because of the wetness and the flooding. These limitations also severely restrict urban development. They can be overcome only by extensive flood-control and drainage measures.

The capability subclass is Vw. The woodland ordination symbol assigned to the Herod soil is 9W, and that assigned to the Muckalee soil is 7W.

LaB—Lakeland sand, 0 to 8 percent slopes. This excessively drained, nearly level to gently sloping soil is on broad ridgetops and short hillsides in the uplands. Slopes are smooth and convex. Areas are 10 to 350 acres in size.

Typically, the soil is sand throughout. The surface

layer is very dark grayish brown. It is 4 inches thick. The underlying layers to a depth of 85 inches or more are dominantly yellowish brown.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is very rapid in the underlying material. Available water capacity is low. Tilth is good. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Ailey, Fuquay, Cowarts, and Troup soils.

The Lakeland soil is poorly suited to field crops because of the low available water capacity. In the nearly level and very gently sloping areas, however, crops respond favorably to irrigation. The soil is moderately suited to hay and pasture. Returning crop residue to the soil conserves moisture.

The potential productivity for slash pine and loblolly pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to most urban uses, but seepage is a limitation on sites for most sanitary facilities. Because it is too sandy, the soil is poorly suited to most kinds of recreational development.

The capability subclass is IVs, and the woodland ordination symbol is 9S.

LaD—Lakeland sand, 8 to 15 percent slopes. This excessively drained, strongly sloping and moderately steep soil is mainly on narrow ridgetops and short hillsides in the uplands. Slopes are irregular and convex. Areas are 10 to 50 acres in size.

Typically, the soil is sand throughout. The surface layer is very dark grayish brown. It is 4 inches thick. The underlying layers to a depth of 85 inches or more are dominantly yellowish brown.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is very rapid in the underlying material. Available water capacity is low. Tilth is good. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Ailey, Cowarts, and Troup soils.

The Lakeland soil is unsuited to field crops because of the slope and the low available water capacity. It is moderately suited to hay and pasture.

The potential productivity for slash pine and loblolly pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is only moderately suited to most urban uses because of the slope. Also, seepage is a limitation on sites for most sanitary facilities. Because it is too sandy, the soil is poorly suited to recreational development.

The capability subclass is VIs, and the woodland ordination symbol is 9S.

LuB—Lucy loamy sand, 0 to 5 percent slopes. This well drained, nearly level and very gently sloping soil is on the broad tops of ridges in the uplands. Slopes are smooth and convex. Areas are 10 to 50 acres in size.

Typically, the surface layer is dark brown loamy sand 6 inches thick. The subsurface layer is yellowish brown loamy sand. It extends to a depth of 24 inches. The subsoil extends to a depth of 65 inches or more. The upper part is yellowish red sandy loam, and the lower part is dominantly red sandy clay loam.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is rapid in the upper sandy layers, moderately rapid in the upper part of the subsoil, and moderate in the rest of the subsoil. Available water capacity is low. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Faceville, Fuquay, and Troup soils.

The Lucy soil is only moderately suited to field crops because of the low available water capacity. It is well suited to hay and pasture. Returning crop residue to the soil conserves moisture. During dry periods crops respond favorably to irrigation.

The potential productivity for slash pine, longleaf pine, and loblolly pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting,

and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to urban uses, but seepage is a limitation on sites for some sanitary facilities. Because it is too sandy, the soil is only moderately suited to recreational development.

The capability subclass is IIs, and the woodland ordination symbol is 8S.

LuC—Lucy loamy sand, 5 to 8 percent slopes. This well drained, gently sloping soil is on ridgetops and hillsides in the uplands. Slopes are smooth and convex. Areas are 10 to 20 acres in size.

Typically, the surface layer is dark brown loamy sand 6 inches thick. The subsurface layer is yellowish brown loamy sand. It extends to a depth of 24 inches. The subsoil extends to a depth of 65 inches or more. The upper part is yellowish red sandy loam, and the lower part is dominantly red sandy clay loam.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is rapid in the upper sandy layers, moderately rapid in the upper part of the subsoil, and moderate in the rest of the subsoil. Available water capacity is low. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Faceville and Orangeburg soils.

The Lucy soil is only moderately suited to field crops because of the low available water capacity and the slope. It is well suited to hay and pasture. Returning crop residue to the soil conserves moisture.

The potential productivity for slash pine, longleaf pine, and loblolly pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment commonly is limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to most urban uses, but seepage is a limitation on sites for some sanitary facilities. Because it is too sandy, the soil is only moderately suited to recreational development.

The capability subclass is IIIs, and the woodland ordination symbol is 8S.

MaB—Marlboro sandy loam, 2 to 5 percent slopes. This well drained, very gently sloping soil is on the broad tops of ridges in the uplands. Slopes are smooth and convex. Areas are 10 to 70 acres in size.

Typically, the surface layer is dark grayish brown sandy loam 6 inches thick. The subsoil to a depth of 65 inches or more is sandy clay. The upper part is yellowish brown, the next part is strong brown and has yellowish red mottles, and the lower part is mottled strong brown, yellowish brown, red, and light gray.

The soil is low in natural fertility and low or moderately low in content of organic matter. The surface layer is strongly acid or medium acid in unlimed areas. The subsoil is strongly acid or very strongly acid. Permeability is moderate in the subsoil. Available water capacity is moderate. Tilth is good. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Dothan, Faceville, and Tifton soils. Also included are a few areas of soils that are slowly permeable below a depth of 40 inches.

The Marlboro soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. Good tilth can be easily maintained by returning crop residue to the soil. Erosion is a moderate hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is moderate on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development. The clayey subsoil limits a few uses.

The capability subclass is IIe, and the woodland ordination symbol is 8A.

Ms—Mascotte sand. This poorly drained, nearly level soil is on broad, smooth uplands. Slopes are 0 to 2 percent. Areas are 30 to 100 acres in size.

Typically, the surface layer is very dark gray sand 6 inches thick. The subsurface layer is gray sand. It extends to a depth of 11 inches. It is underlain by a weakly cemented, organically stained layer of dark brown sand about 11 inches thick. The next layer is pale brown sand. It extends to a depth of 30 inches. Below this to a depth of 65 inches or more is sandy clay loam that is mainly light gray and gray and has

yellowish brown, strong brown, and pale brown mottles.

This soil is low in natural fertility and moderate or high in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability generally is moderate in the subsoil. Available water capacity is low. Tilth is good. The soil has a weakly cemented layer that restricts root penetration during dry periods. The water table commonly is within a depth of 1 foot from winter to mid spring.

Included with this soil in mapping are small areas of Pelham and Ocilla soils.

In most areas the Mascotte soil is wooded. It is poorly suited to field crops because of the wetness and the low available water capacity. The weakly cemented layer restricts root penetration during dry periods. The soil is moderately suited to hay and pasture.

The potential productivity for slash pine and loblolly pine is moderate on this soil. The seasonal wetness limits the use of conventional equipment and increases the seedling mortality rate. The equipment limitation commonly can be overcome by using modified special implements or by operating the equipment only during the drier seasons. A drainage system and control of plant competition commonly increase the seedling survival rate.

This soil is poorly suited to most urban uses and to recreational development because of the wetness. Most areas can be drained if the drainage system is properly designed and installed.

The capability subclass is IVw, and the woodland ordination symbol is 10W.

NaB—Nankin loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on the narrow tops of ridges in the uplands. Slopes are irregular, undulating, and convex. Areas are 10 to 60 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 7 inches thick. The subsoil extends to a depth of 42 inches. The upper part is strong brown sandy clay, and the lower part is strong brown sandy clay loam that has red mottles. The substratum to a depth of 65 inches or more is mottled yellowish brown, red, and light gray sandy clay loam.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil, moderately slow in the rest of the subsoil, and moderate in the substratum. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The effective root zone generally is limited to the upper 2 to 3 feet of the soil. The hard and firm substratum cannot be easily penetrated by plant roots.

Included with this soil in mapping are small areas of Cowarts, Dothan, and Tifton soils. Also included are areas of soils that have gray mottles in the upper part of the subsoil.

The Nankin soil is well suited to field crops, hay, and pasture, but yields are somewhat reduced because the effective root zone is limited. Good tilth can be maintained by returning crop residue to the soil. Erosion is a moderate hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is moderate on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses. The moderately slow permeability in the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures. The soil is only moderately suited to most kinds of recreational development because of the moderately slow permeability.

The capability subclass is IIe, and the woodland ordination symbol is 8A.

NkC2—Nankin sandy loam, 5 to 8 percent slopes, eroded. This well drained, gently sloping soil is on hillsides in the uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places slopes are choppy and irregular and have galled spots and an occasional gully. Areas are 10 to 30 acres in size.

Typically, the surface layer is dark brown sandy loam 5 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part is strong brown sandy clay, the next part is strong brown sandy clay loam that has red and yellowish brown mottles, and the lower part is mottled yellowish brown, light gray, and yellowish red sandy clay loam.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil, moderately slow in the next part, and moderate in the lower part. Available water capacity is moderate. Runoff is rapid. The effective root zone generally is limited to the upper 2 to 4 feet of the soil. The hard and firm substratum cannot be easily penetrated by plant roots.

Included with this soil in mapping are small areas of Cowarts and Tifton soils. Also included are areas of soils that have gray mottles in the upper and middle parts of the subsoil.

The Nankin soil is only moderately suited to field crops, hay, and pasture because of the rapid runoff and the somewhat gullied, choppy and irregular slopes. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is moderate on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses. The moderately slow permeability in the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this can be overcome by special design and installation procedures. The soil is only moderately suited to most kinds of recreational development because of the moderately slow permeability.

The capability subclass is IVe, and the woodland ordination symbol is 8A.

Oc—Ochlockonee sandy loam, occasionally flooded. This well drained, nearly level soil is on narrow flood plains. It is occasionally flooded for very brief periods from late fall to mid spring. Slopes are 0 to 2 percent. Areas are 5 to 15 acres in size.

Typically, the surface layer is dark grayish brown sandy loam 8 inches thick. The underlying layers are yellowish brown sandy loam and brownish yellow loamy fine sand. They extend to a depth of 28 inches. They are underlain by a buried horizon of very dark grayish brown loam, which extends to a depth of 40 inches. Below this to a depth of 65 inches or more is yellowish brown sandy loam that has thin strata of dark brown sandy loam.

This soil is medium in natural fertility and low or moderately low in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate to a depth of 40 inches and moderately rapid below that depth. Available water capacity is moderate. Tilth is good. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are small areas of Muckalee and Rains soils.

The Ochlockonee soil is only moderately suited to field crops because of the hazard of flooding. It is well suited to hay and pasture. During dry periods crops respond favorably to irrigation. A conservation tillage system conserves moisture and helps to maintain the content of organic matter.

The potential productivity for loblolly pine, slash pine, and yellow poplar is high on this soil. No significant limitations affect woodland.

Because of the flooding, this soil is severely limited as a site for urban uses and is only moderately suited to most kinds of recreational development. This hazard can be overcome only by extensive flood-control measures.

The capability subclass is IIw, and the woodland ordination symbol is 11A.

Od—Ocilla loamy sand, 0 to 2 percent slopes. This somewhat poorly drained, nearly level soil is mainly on broad, smooth, slightly depressional uplands. Areas are 5 to 50 acres in size.

Typically, the surface layer is dark gray loamy sand 5 inches thick. The subsurface layer is loamy sand. It extends to a depth of 24 inches. The upper part is pale yellow, and the lower part is yellowish brown. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is brownish yellow and has light brownish gray mottles, the next part is brownish yellow and has light gray mottles, and the lower part is mottled strong brown, yellowish red, and light gray.

This soil is low in natural fertility and moderately low in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderately rapid or rapid in the upper sandy layers and moderate in the subsoil. Available water capacity is low. Tilth is good. The root zone usually is deep, but it is limited from winter to mid spring, when the high water table is at a depth of 1.0 to 2.5 feet.

Included with this soil in mapping are small areas of Clarendon, Pelham, and Rains soils.

The Ocilla soil is only moderately suited to field crops because of the wetness. A drainage system commonly can help to overcome this limitation. The soil is well suited to hay and pasture.

The potential productivity for loblolly pine and slash pine is moderate on this soil. The seasonal wetness limits the use of conventional equipment and increases the seedling mortality rate. The equipment limitation commonly can be overcome by using modified or special implements or by operating the equipment only during the drier periods. A drainage system and control of plant competition commonly increase the seedling survival rate.

Because of the wetness, this soil is poorly suited to most urban uses and is only moderately suited to

recreational development. This limitation can be minimized by a drainage system.

The capability subclass is IIIw, and the woodland ordination symbol is 8W.

OrA—Orangeburg loamy sand, 0 to 2 percent slopes. This well drained, nearly level soil is on the broad tops of ridges in the uplands. Areas are 10 to 70 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish red, and the lower part is red.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by roots.

Included with this soil in mapping are a few small areas of Lucy soils.

The Orangeburg soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. A conservation tillage system conserves moisture and helps to maintain the content of organic matter.

The potential productivity for loblolly pine and slash pine is high on this soil. No significant limitations affect woodland.

This soil is well suited to urban uses and to recreational development.

The capability class is I, and the woodland ordination symbol is 8A.

OrB—Orangeburg loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on ridgetops and hillsides in the uplands. Slopes are smooth and convex. Areas are 10 to 200 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish red, and the lower part is red.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Lucy soils.

The Orangeburg soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. Erosion is a moderate hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development.

The capability subclass is IIe, and the woodland ordination symbol is 8A.

OrE—Orangeburg loamy sand, 12 to 17 percent slopes. This well drained, moderately steep soil is on hillsides in the uplands. In most places slopes are irregular and have a few galled spots and an occasional gully. Areas are 5 to 60 acres in size.

Typically, the surface layer is dark brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish red, and the lower part is dark red.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Cowarts, Faceville, Greenville, and Nankin soils. Also included are a few small areas of soils that have a surface layer of sandy loam.

The Orangeburg soil is unsuited to field crops because of the slope, but it is well suited to hay and pasture. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard if this soil is cultivated.

The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is only moderately suited to most urban uses and to recreational development because of the slope.

The capability subclass is VIe, and the woodland ordination symbol is 8A.

OsC2—Orangeburg sandy loam, 5 to 8 percent slopes, eroded. This well drained, gently sloping soil is on hillsides in the uplands. The surface layer is a

mixture of the original surface soils and the upper part of the subsoil. In most places slopes are convex and have galled spots and an occasional gully. Areas are 5 to 50 acres in size.

Typically, the surface layer is brown sandy loam 5 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish red, and the lower part is red.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Faceville and Lucy soils. Also included are a few small areas of soils that have a surface layer of sandy clay loam.

The Orangeburg soil is well suited to field crops, hay, and pasture. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for slash pine and loblolly pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development.

The capability subclass is IIIe, and the woodland ordination symbol is 8A.

OsD2—Orangeburg sandy loam, 8 to 12 percent slopes, eroded. This well drained, strongly sloping soil is on hillsides in the uplands. The surface layer is a mixture of of the original surface soil and the upper part of the subsoil. In most places slopes are irregular and have galled spots and an occasional gully. Areas are 5 to 60 acres in size.

Typically, the surface layer is brown sandy loam 5 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish red, and the lower part is red.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Cowarts, Faceville, Greenville, and Nankin soils. Also included are a few small areas of soils that have a surface layer of sandy clay loam and have slopes of more than 12 percent.

The Orangeburg soil is only moderately suited to field crops because of the slope and the somewhat gullied landscape. It is well suited to hay and pasture. Returning crop residue to the soil helps to maintain tilth. Erosion is a severe hazard unless cultivated areas are protected.

The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is only moderately suited to most urban uses and to recreational development because of the slope.

The capability subclass is IVe, and the woodland ordination symbol is 8A.

Pe—Pelham loamy sand. This poorly drained, nearly level soil is on broad, smooth uplands and near drainageways. Slopes are 0 to 2 percent. Areas are 10 to 40 acres in size.

Typically, the surface layer is very dark gray loamy sand 8 inches thick. The subsurface layer is gray loamy sand. It extends to a depth of 27 inches. The subsoil to a depth of 65 inches or more is dominantly gray sandy clay loam that has mottles in shades of brown.

This soil is low in natural fertility and moderately low in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability is rapid in the upper sandy layers and moderate in the subsoil. Available water capacity is low. Tilth is good. The root zone usually is deep, but it is limited from winter to mid spring, when the water table is at a depth of 0.5 foot to 1.5 feet.

Included with this soil in mapping are a few small areas of Mascotte, Ocilla, and Rains soils. Also included are small areas that are subject to flooding or ponding.

The potential productivity for slash pine and loblolly pine is high on this soil. The seasonal wetness limits the use of conventional equipment and increases the seedling mortality rate. The equipment limitation commonly can be overcome by using modified equipment or by operating the equipment only during the drier periods. Drainage measures, a bedding system, control of competing plants, and selection of suitable species for planting commonly increase the seedling survival rate.

Because of the wetness, this soil is unsuited to field crops, hay, and pasture, is poorly suited to recreational

development, and is severely limited as a site for urban uses. This limitation can be overcome only by an extensive drainage system.

The capability subclass is Vw, and the woodland ordination symbol is 11W.

Ra—Rains sandy loam. This poorly drained, nearly level soil is in slight depressions and on smooth uplands. Slopes are 0 to 2 percent. Areas are 10 to 30 acres in size.

Typically, the surface layer is very dark gray sandy loam 6 inches thick. The subsurface layer is dark grayish brown sandy loam. It extends to a depth of 15 inches. The subsoil to a depth of 65 inches or more is dominantly gray sandy clay loam that has yellowish brown, strong brown, and yellowish red mottles.

This soil is low in natural fertility and moderately low or moderate in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. Tilth is good. The root zone usually is deep, but it is limited from late fall to mid spring, when the water table is at a depth of 1 foot or less.

Included with this soil in mapping are small areas of Grady, Herod, and Muckalee soils. Also included are some small areas that are subject to flooding or ponding.

In most areas the Rains soil is wooded. It has high potential productivity for loblolly pine and slash pine. The seasonal wetness limits the use of conventional equipment and increases the seedling mortality rate. The equipment limitation commonly can be overcome by using modified equipment or by operating the equipment only during the drier periods. Drainage measures, a bedding system, control of competing plants, and selection of suitable species for planting commonly increase the seedling survival rate.

This soil is well suited to hay and pasture. Because of the wetness, it is only moderately suited to field crops, is poorly suited to recreational development, and is severely limited as a site for urban uses. The wetness can be overcome only by an extensive drainage system.

The capability subclass is IIIw, and the woodland ordination symbol is 10W.

ReB—Red Bay loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on the broad tops of ridges in the uplands. Slopes are smooth and convex. Areas are 10 to 30 acres in size.

Typically, the surface layer is dark reddish brown loamy sand 6 inches thick. The subsoil extends to a depth of 75 inches or more. The upper few inches are dark reddish brown sandy loam, and the rest of the subsoil is dark red sandy clay loam.

This soil is low in natural fertility and low or moderately low in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the subsoil. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Americus, Greenville, and Orangeburg soils.

The Red Bay soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. Good tilth can be easily maintained by returning crop residue to the soil. Erosion is a moderate hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to urban uses and to recreational development.

The capability subclass is IIe, and the woodland ordination symbol is 9A.

SuB—Susquehanna sandy loam, 2 to 5 percent slopes. This somewhat poorly drained, very gently sloping soil is on ridgetops and hillsides in the uplands. Slopes are undulating and convex. Areas are 5 to 30 acres in size.

Typically, the surface layer is very dark gray sandy loam 3 inches thick. The subsoil to a depth of 65 inches or more is clay. The upper part is yellowish red and has grayish brown mottles, the next part is light brownish gray and has red mottles, and the lower part is light gray and has pale yellow and brownish yellow mottles.

This soil is low in natural fertility and low or moderately low in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is very slow in the subsoil. Available water capacity is moderate. The effective root zone is limited because the clayey, very hard and firm subsoil cannot be easily penetrated by plant roots. Though this soil is somewhat poorly drained, it does not have a fluctuating high water table. It is wet only during periods of heavy rainfall.

Included with this soil in mapping are areas of Cowarts, Dothan, and Nankin soils. Also included is a somewhat poorly drained soil that has a clayey subsoil

and is underlain by gray sandstone at a depth of about 40 inches or less.

The Susquehanna soil is poorly suited to field crops. It is moderately suited to hay and pasture. The restricted effective root zone is the main limitation.

The potential productivity for loblolly pine and shortleaf pine is only moderate on this soil because of the firm, very slowly permeable subsoil. Subsoiling or chiseling after harvesting can accelerate revegetation or improve the site for replanting. Erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is poorly suited to most urban uses and to recreational development. The very slow permeability and a high shrink-swell potential in the subsoil are the main limitations.

The capability subclass is IVe, and the woodland ordination symbol is 8C.

SuC—Susquehanna sandy loam, 5 to 12 percent slopes. This somewhat poorly drained, gently sloping and strongly sloping soil is on short hillsides in the uplands. Slopes are irregular and short. Areas are 5 to 50 acres in size.

Typically, the surface layer is very dark gray sandy loam 3 inches thick. The subsoil to a depth of 65 inches or more is clay. The upper part is yellowish red and has grayish brown mottles, the next part is light brownish gray and has red mottles, and the lower part is light gray and has pale yellow and brownish yellow mottles.

This soil is low in natural fertility and low or moderately low in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is very slow in the subsoil. Available water capacity is moderate. Runoff is rapid. The effective root zone is limited because the clayey, very hard and firm subsoil cannot be easily penetrated by plant roots. Though this soil is somewhat poorly drained, it does not have a fluctuating high water table. It is wet only during periods of heavy rainfall.

Included with this soil in mapping are areas of Cowarts and Nankin soils. Also included are a few areas where gray sandstone boulders are on the surface.

The Susquehanna soil is unsuited to field crops and is poorly suited to hay and pasture. The restricted effective root zone and the slope are the main limitations.

The potential productivity for loblolly pine and shortleaf pine is only moderate on this soil because of the firm, very slowly permeable subsoil. Subsoiling or chiseling after harvesting can accelerate revegetation or improve the site for replanting. Erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is poorly suited to most urban uses and to recreational development. The very slow permeability and a high shrink-swell potential in the subsoil are the main limitations.

The capability subclass is VIe, and the woodland ordination symbol is 8C.

TC—Tawcaw-Chastain-Congaree association, frequently flooded. These nearly level soils formed in clayey or loamy sediments on flood plains. They are frequently flooded from late fall to mid spring. The somewhat poorly drained Tawcaw soil commonly is on the slightly higher parts of the flood plains, the poorly drained Chastain soil generally is in sloughs and depressions next to the uplands, and the well drained or moderately well drained Congaree soil is on natural levees adjacent to stream channels. The three soils are in each mapped area and occur in a regular repeating pattern. Areas generally are long and wide. Slopes are 0 to 2 percent.

The Tawcaw soil makes up about 50 percent of the map unit. Typically, the surface layer is reddish brown silty clay loam 7 inches thick. The subsoil to a depth of 65 inches or more is dominantly silty clay. The upper part is mainly brown and dark brown, the next part is light gray and has brown mottles, and the lower part is mottled pale brown, yellowish brown, and light gray.

The Tawcaw soil is low in natural fertility and moderate in content of organic matter. It is very strongly acid to slightly acid throughout. Permeability is slow in the subsoil. Available water capacity is moderate. The root zone usually is deep, but it is limited from late fall to mid spring, when the water table is at a depth of 1.5 to 2.5 feet or when the soil is flooded for long periods.

The Chastain soil makes up about 35 percent of the map unit. Typically, the surface layer is dark brown silty clay 5 inches thick. The subsoil extends to a depth of 49 inches. The upper part is dark yellowish brown silty clay loam that has light brownish gray mottles, the next part is light brownish gray silty clay loam that has strong brown mottles, and the lower part is light brownish gray clay loam that has strong brown and yellowish red mottles. The substratum to a depth of 72 inches or more is stratified sand, sandy loam, and clay. It is light brownish gray, yellowish brown, and brownish yellow.

The Chastain soil is low in natural fertility and moderate or high in content of organic matter. It is very strongly acid or medium acid to a depth of 40 inches and is slightly acid to mildly alkaline below that depth. Permeability is slow in the subsoil. Available water capacity is moderate. The root zone usually is deep, but

it is limited from late fall to late spring, when the water table commonly is within a depth of 1 foot or when the soil is flooded for long periods.

The Congaree soil makes up about 12 percent of the map unit. Typically, the surface layer is reddish brown loam 6 inches thick. The underlying layers to a depth of 65 inches or more are stratified silt loam, loam, fine sandy loam, and loamy sand. They are reddish brown, dark brown, and yellowish brown and have brownish mottles.

The Congaree soil is low in natural fertility and low to moderate in content of organic matter. It is strongly acid or medium acid. Permeability is moderate in the underlying layers. Available water capacity is high. The root zone is deep. From late fall to mid spring, however, the water table, which commonly is at a depth of 2.5 to 4.0 feet, somewhat limits the growth of some plants.

Included with these soils in mapping are small areas of Herod and Muckalee soils.

The Tawcaw and Chastain soils are unsuited to field crops, hay, and pasture because they are frequently flooded during the planting season. The Congaree soil is moderately suited to field crops and well suited to hay and pasture. Flooding can be expected from winter to mid spring, but it commonly is not a hazard during the growing season.

The potential productivity for sweetgum, yellow poplar, slash pine, and loblolly pine is high on these soils. The seasonal wetness and the flooding limit the use of conventional equipment and increase the seedling mortality rate on the Tawcaw and Chastain soils. The equipment limitation commonly can be overcome by using modified equipment or by operating the equipment only during the drier periods. Drainage measures, a bedding system, control of competing plants, and selection of suitable species for planting commonly increase the seedling survival rate. No significant limitations affect wooded areas of the Congaree soil.

These soils are severely limited as sites for urban uses and recreational development because of the wetness and the flooding. These limitations can be overcome only by extensive flood-control and drainage measures.

The Tawcaw and Chastain soils are in capability subclass VIw, and the Congaree soil is in capability subclass IIIw. The woodland ordination symbol assigned to the Tawcaw and Chastain soils is 8W, and that assigned to the Congaree soil is 10A.

TfA—Tifton loamy sand, 0 to 2 percent slopes. This well drained, nearly level soil is on the tops of ridges in the uplands. Areas are 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish brown, the next part is yellowish brown and has red mottles, and the lower part is mottled yellowish brown, red, and light gray. The content of plinthite is 5 percent or more below a depth of about 36 inches. Nodules of ironstone are on the surface and in the upper 36 inches.

This soil is low in natural fertility and in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Dothan, Fuquay, and Marlboro soils.

The Tifton soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. A conservation tillage system helps to maintain the content of organic matter.

The potential productivity for loblolly pine and slash pine is high on this soil. No significant limitations affect woodland.

This soil is well suited to most urban uses and to recreational development. The moderate permeability in the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures.

The capability class is I, and the woodland ordination symbol is 9A.

TfB—Tifton loamy sand, 2 to 5 percent slopes. This well drained, very gently sloping soil is on ridgetops and hillsides in the uplands. Slopes commonly are smooth and convex. Areas are 10 to 150 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is yellowish brown, the next part is yellowish brown and has red mottles, and the lower part is mottled yellowish brown, red, and light gray. The content of plinthite is 5 percent or more below a depth of about 36 inches. Nodules of ironstone are on the surface and in the upper 36 inches.

This soil is low in natural fertility and in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. Tilth is good. The soil can be

Figure 3.—Loblolly pine in an area of Tifton loamy sand, 2 to 5 percent slopes. This soil is well suited to the pine trees commonly grown in the survey area.

worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Carnegie, Dothan, Fuquay, and Marlboro soils.

The Tifton soil is well suited to field crops, hay, and pasture. During dry periods crops respond favorably to irrigation. Good tilth can be easily maintained by returning crop residue to the soil. Erosion is a moderate hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is high on this soil (fig. 3). Although no significant limitations affect woodland, erosion should be

minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development. The moderate permeability in the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures.

The capability subclass is IIe, and the woodland ordination symbol is 9A.

TnC2—Tifton sandy loam, 5 to 8 percent slopes, eroded. This well drained, gently sloping soil is on short hillsides in the uplands. The surface layer is a mixture of the original surface soil and the upper part of the subsoil. In most places slopes are irregular and convex and have galled spots and an occasional gully. Areas are 5 to 25 acres in size.

Typically, the surface layer is dark brown sandy loam 6 inches thick. The subsoil to a depth of 65 inches or more is dominantly sandy clay loam. The upper part is strong brown, the next part is strong brown and has red mottles, and the lower part is mottled yellowish brown, red, and light gray. The content of plinthite is 5 percent or more below a depth of about 43 inches. Nodules of ironstone are on the surface and throughout the soil.

This soil is low in natural fertility and in content of organic matter. It is very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Carnegie and Dothan soils.

The Tifton soil is well suited to field crops, hay, and pasture. Good tilth can be maintained by returning crop residue to the soil. Erosion is a severe hazard unless cultivated areas are protected. A conservation tillage system, a water management system, or a combination of both helps to control runoff and erosion.

The potential productivity for loblolly pine and slash pine is high on this soil. Although no significant limitations affect woodland, erosion should be minimized by harvesting, thinning, and otherwise managing the woodland on the contour.

This soil is well suited to most urban uses and to recreational development. The moderate permeability in the subsoil is a limitation on sites for septic tank absorption fields. Commonly, this limitation can be overcome by special design and installation procedures.

The capability subclass is IIIe, and the woodland ordination symbol is 9A.

TrB—Troup sand, 0 to 6 percent slopes. This well drained, nearly level to gently sloping soil is mainly on the broad tops of ridges in the uplands. Slopes commonly are smooth and convex. Areas are 30 to more than 250 acres in size.

Typically, the surface layer is dark grayish brown sand 3 inches thick. The subsurface layer extends to a depth of 72 inches. The upper part is yellowish brown sand, the next part is brownish yellow sand, and the lower part is light yellowish brown sand that has thin strata of strong brown sandy loam. The subsoil to a depth of 98 inches or more is yellowish red sandy loam.

This soil is low in natural fertility and in content of organic matter. It is strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Permeability is rapid in the upper sandy layers and moderate in the subsoil. Available water capacity is low. Tilth is good. The root zone is deep and can be easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Ailey, Fuquay, and Lakeland soils. Also included are a few areas of soils that are moderately slowly permeable at a depth of about 40 to 70 inches and soils that have slopes of more than 6 percent.

The Troup soil is only moderately suited to field crops, hay, and pasture because of the low available water capacity. Returning crop residue to the soil conserves moisture. Yields of the commonly grown crops can be increased by irrigation.

The potential productivity for loblolly pine and slash pine is moderate on this soil. Because of the low available water capacity, seedling mortality is a management concern. Proper planting procedures, selection of suitable drought-hardy species for planting, and control of plant competition commonly increase the seedling survival rate. Because of the sandiness of the soil, the use of conventional equipment is commonly limited. Using special implements or operating the equipment only during the wetter periods can help to overcome the equipment limitation.

This soil is well suited to most urban uses, but seepage is a limitation on sites for most sanitary facilities. Because it is too sandy, the soil is poorly suited to most kinds of recreational development.

The capability subclass is IIIs, and the woodland ordination symbol is 8S.

Ud—Udorthents, loamy. These very gently sloping to strongly sloping soils are in borrow areas, mainly near Interstate Highway 16 and other roads. These areas have been cut, filled, and shaped. Slopes are 2 to 10 percent. Areas are 3 to 15 acres in size.

A typical excavated area is 5 to 15 feet deep. It consists mainly of sandy and loamy material or

remnants of the original underlying material.

The borrow areas are very low in natural fertility and in content of organic matter. They are mainly very strongly acid. Permeability generally is moderate in the loamy material and moderately rapid or rapid in the sandy material. The root zone is deep.

Most of the acreage is idle land that has been revegetated. Some areas have been shaped, sodded, and planted to trees. These soils are poorly suited to the cultivated crops commonly grown in the survey area. Some areas could be planted to hardwoods or evergreens or developed for recreational uses or wildlife habitat.

These soils are not assigned to a capability class or a woodland ordination symbol.

Important Farmland

In this section the important farmland in the county is identified. This land is either prime farmland or additional farmland of statewide importance.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the nation's short- and long-range needs for food and fiber. Because the acreage of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce sustained high yields of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 8 percent.

Prime farmland may be cropland, pasture, woodland, or other land that either is used for food or fiber crops or is available for those crops. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land, 10 acres or more in size, that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land occurs as the areas in national forests, in national and state parks, and on military reservations that are not available for farming.

About 339,500 acres in the survey area, or 47 percent of the total acreage, meets the soil requirements for prime farmland. The map units that are considered prime farmland or additional farmland of statewide importance, and the acreage of each, are listed in table 5. This list does not constitute a recommendation for a particular land use. The location of each map unit is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units."

A recent trend in land use in some parts of the counties has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on additional farmland of statewide importance.

Additional Farmland of Statewide Importance

About 201,140 acres in the survey area is additional farmland of statewide importance. This farmland consists of soils that are important as part of the agricultural resource base in the counties but that do not meet the requirements for prime farmland. These soils are more erodible than the soils that are considered prime farmland, usually are less productive, are droughty or seasonally wet, and cannot be easily cultivated. The slope is 8 percent or less.

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 suitability 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 for 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 suitability and limitations of each soil for specific land uses and to help to 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 that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where 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

James E. Dean, conservation agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the 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.

Controlling erosion, removing excess water, and maintaining good tilth and productivity are the most common management needs on the farmland in the survey area.

Many of the soils in the survey area, such as Carnegie, Cowarts, Dothan, Faceville, Greenville, Nankin, Orangeburg, and Tifton, are susceptible to erosion. The degree of soil erosion depends on the erodibility of the soil, the frequency and intensity of rainfall, the steepness and length of slopes, the kind of crop on the soil, and the kind of tillage system.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a clayey subsoil, such as Carnegie and Nankin soils. Second, soil erosion on farmland results in the sedimentation of streams. Control of erosion minimizes this pollution and improves the quality of water for municipal use, recreation, and fish and wildlife.

Erosion-control practices provide a protective surface cover, help to control runoff, and increase the rate of water infiltration. A cropping system that keeps a plant cover on the soil for extended periods helps to maintain the productive capacity of the soils. In sloping areas on livestock farms, which require pasture and hay, including forage crops in the cropping system helps to control erosion and improves tilth for the following crop.

Applying conservation tillage systems that leave adequate amounts of crop residue on the surface increases the rate of water infiltration and helps to

Figure 4.—Soybeans in an area of Dothan loamy sand, 2 to 5 percent slopes, where a system of conservation tillage has been applied.

control runoff and erosion (fig. 4). Conservation tillage can be used on most of the soils in the survey area. No-till planting of corn and soybeans, for example, helps to control erosion on sloping land and is suitable on most of the soils in the survey area. The acreage of no-till corn and soybeans is increasing in the survey area.

Terraces and diversions reduce the length of slopes and thus help to control runoff and the erosion caused by concentrated flow. They are most practical on well drained, very gently gloping or gently sloping soils that have smooth, convex slopes. Most areas of Carnegie, Cowarts, Dothan, Faceville, Greenville, Marlboro, Nankin, Orangeburg, Red Bay, and Tifton soils are suitable for terracing.

Contour farming is effective in controlling erosion in the survey area. It is most effective in areas where slopes are smooth, relatively short, and uniform, including most areas of the very gently sloping or gently sloping Carnegie, Cowarts, Dothan, Faceville, Greenville, Marlboro, Nankin, Orangeburg, and Tifton soils.

Soil blowing is a hazard on the sandy Americus, Fuquay, Lakeland, Lucy, and Troup soils. It can damage these soils and the young plants growing on them if the soils are dry and have little surface cover.

Maintaining a good ground cover or keeping the surface rough through proper tillage minimizes soil blowing. Windbreaks are effective in controlling soil blowing in open fields.

Information about the erosion-control measures suitable for each kind of soil is available at local offices of the Soil Conservation Service.

Excess water is the main limitation on soils that are not well drained. The type of drainage system needed depends on the amount of water in the soils and the kind of crops grown. The design of both surface and subsurface drainage systems varies with the kind of soil. After the water is controlled, the only management measures needed are those that help to maintain productivity and good tilth. Erosion is not a serious problem on these soils.

Soil fertility is naturally low in most of the soils in the survey area. Crops on these soils respond well to applications of fertilizer and other good management. The poorly drained soils in upland depressions, near drainageways, and on flood plains, such as Grady, Herod, Muckalee, Pelham, and Rains soils, commonly have more organic matter than most of the better drained soils in the higher areas.

Most of the soils are naturally acid. If the soils that are used for field crops, hay, or pasture have never been limed, applications of ground limestone are needed to raise the pH level sufficiently for legumes and other crops that grow well on nearly neutral soils. Herod and Muckalee soils are naturally less acid than the other soils in the survey area. Available phosphorus and potassim levels are naturally low in most of the soils. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the needs of the crop, and on the desired level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to be applied.

Soil tilth is an important factor affecting the germination of seeds, plant growth, and the infiltration of water into the soil. Soils with good tilth are granular and porous.

In this survey area, most of the soils used for crops have a surface layer of loamy sand or sandy loam that is low in content of organic matter. Tilth is good in most areas, except for areas of eroded soils in which the subsoil is exposed. Regular applications of crop residue, manure, or other organic material help to maintain tilth.

Fall plowing, which incorporates crop residue into the soil, is not a good practice unless a cover crop protects the surface after the soil is plowed. Most of the cropland in the survey area consists of soils that are subject to erosion if they are plowed in the fall.

Many field crops are suited to the soils and climate of the survey area. Corn, soybeans, and peanuts are commonly grown. The acreage used for cotton is increasing. Wheat, rye, and oats are the most common small grain crops.

Improved bermudagrass and bahiagrass are the most common pasture grasses. Moderately well drained and well drained, loamy or clayey soils, such as the moderately well drained Clarendon and well drained Dothan and Tifton soils, are well suited to these grasses. The excessively drained Lakeland, somewhat excessively drained Americus, and well drained Fuquay, Lucy, and Troup soils are examples of soils that have a low available water capacity and are best suited to improved bermudagrass. The somewhat poorly drained Ocilla soils are examples of soils that are seasonally wet and are best suited to bahiagrass.

The specialty crops grown commercially in the survey area are vegetables and tree fruits. Soils that are characterized by good natural drainage and that warm up early in spring are especially well suited to many vegetables and small fruits. In this survey area these are the Carnegie, Cowarts, Dothan, Faceville, Greenville, Marlboro, Nankin, Orangeburg, and Tifton soils that have slopes of 8 percent or less. If irrigated, Americus, Lakeland, Lucy, and Troup soils also are well suited to vegetables and small fruits. Specialty crops generally can be planted and harvested earlier on these soils than on the other soils in the survey area. If excess water is removed, the somewhat poorly drained Ocilla soils and the moderately well drained Clarendon soils are well suited to a wide range of vegetables.

Most of the well drained soils in the survey area are suitable for orchards and nursery plants. Soils in low areas, where frost is frequent and air drainage is poor, generally are poorly suited to early vegetables, small fruits, and orchards.

The latest information about growing specialty crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation 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 6. 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 also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss. The fertilizer needs of specific crops on specific soils can be determined by soil tests. General fertilizer recommendations for field crops are available *(5)*.

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 6 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 use as cropland. 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 and 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.

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 few 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 they 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.

There are no class VII or VIII soils in this survey area.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, or *s*, to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless a 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); and *s* shows that the soil is limited mainly because it is droughty.

There are no subclasses in class I because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w*. The soils in this class are subject to little or no erosion, but they have other limitations or hazards that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in table 6.

Woodland Management and Productivity

Gary L. Tyre, forester, Soil Conservation Service, helped prepare this section.

The commercial woodland in this survey area includes 109,097 acres in Johnson County and 313,161 acres in Laurens County *(11)*. The woodland in Johnson County is about 42 percent southern pine, 22 percent

mixed oak and pine, and 15 percent oak and hickory or oak, gum, and cypress. The woodland in Laurens County is about 50 percent pine, 10 percent mixed pine and hardwoods, and 18 percent hardwoods. These forest types were significant in the original forests, which were dominated by mixed pine and hardwoods or by hardwoods.

The nature of forest ownership in these counties is similar to that in most of the other counties in Georgia. Holders of small private tracts own about 77 percent of the woodland in Johnson County and 87 percent in Laurens County. These tracts have the most significant management problems and the greatest potential for an increase in production.

The woodland in these counties is in areas of a variety of soils, mainly Dothan, Fuquay, and Tifton soils. Though these soils are commonly used for field crops, they are highly productive if used for woodland crops. Faceville and Orangeburg also are among the soils that are productive if used as woodland. These soils are in the western part of Johnson County and the northern part of Laurens County.

Some areas of the sandy Ailey and Troup soils are used for field crops, but many areas are used as woodland. The sandiness of these soils commonly increases the seedling mortality rate.

Herod and Muckalee soils are on flood plains in the two counties, and Chastain, Congaree, and Tawcaw soils are on flood plains along the Oconee River in Laurens County. These soils are very productive, but their seasonal wetness restricts the use of equipment and results in seedling mortality.

The information in this section is provided to explain the relationship between soils and tree growth in the survey area. Used carefully, this information can be useful in planning woodland conservation practices and in making investment and management decisions.

Soils vary in their ability to produce trees. Depth, fertility, texture, and available water capacity influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site. Available water capacity and depth of the root zone have major effects on tree growth.

This soil survey can be used by woodland managers planning ways to increase the productivity of woodland. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity and the hazards or limitations that affect timber harvesting and production. Table 8 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major limitations to be considered in forest management.

In the column "Common trees," the first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

Table 8 indicates the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where the mean annual increment is greatest.

The second part of the ordination symbol, a letter, indicates the major kind of limitation affecting use and management. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *C* indicates a soil that is limited because of the kind or amount of clay in the upper part of the profile. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil that has no significant limitations. If a soil has more than one limitation, the priority is as follows: W, C, and S.

Ratings of the *erosion hazard* indicate the probability that damage will occur if site preparation or harvesting activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion-control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of *moderate* or *severe* indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, or the use of specialized equipment.

Ratings of *equipment limitation* indicate restrictions on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, or susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. The rating is *slight* if equipment use is restricted by soil wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if soil wetness restricts equipment use from 2 to 6 months per year or if special equipment is needed to prevent or minimize soil compaction. The rating is *severe* if soil wetness restricts equipment use for more than 6 months per year or if special equipment is needed to prevent or minimize soil compaction. Ratings of

moderate or *severe* indicate a need to choose the best suited equipment and to plan the timing of harvesting and other management activities carefully.

Ratings of *seedling mortality* refer to the probability of the death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil 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 the aspect of the slope. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of *moderate* or *severe* indicate that it may be necessary to plant containerized or larger than usual nursery stock or to make special site preparations, such as bedding, furrowing, installing a surface drainage system, or providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is moderate or severe.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *productivity class*. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. Site index curves are used when determinations are made *(3, 4, 7, 8, 10)*.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic meters per hectare per year. Cubic meters per hectare can be converted to cubic feet per acre by multiplying by 14.3. Cubic feet can be converted to board feet by multiplying by a factor of about 5. For example, a productivity class of 8 means that the soil can be expected to produce 114 cubic feet per acre per year at the point where mean annual increment culminates, or about 570 board feet per acre per year.

Trees to plant are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. Desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for reforestation.

Recreation

This survey area provides many opportunities for recreation. The many farm ponds in the area and the Oconee River provide opportunities for fishing. The flood plains near the creeks and rivers, the depressional areas, and the low uplands provide an environment that is well suited to nature study, hunting, and similar activities. The well drained Dothan, Faceville, Greenville, Marlboro, Orangeburg, and Tifton soils, which commonly are on ridgetops, hillsides, or both, are well suited to campsites, picnic areas, parks, paths and trails, golf courses, and nature-study areas. If leveled and smoothed, the areas on ridgetops can be used for playgrounds. The Tifton soils are limited, however, by small stones.

A unique area of interest in the survey area is the "Ohoopee Dunes," which consist of longleaf pine, dwarf live oak, rosemary, and sandstone outcrop. Also of interest are Governor Troop National Resource Reservation and Beaverdam Wildlife Management Area.

In table 9, the soils of the survey area are rated according to the 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 sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils subject to flooding are limited for recreational 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 9, 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 9 can be supplemented by

other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

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 gentle 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, 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

Louis Justice, biologist, and Jim Lathem, soil scientist, Soil Conservation Service, helped prepare this section.

About 60 percent of the acreage in Johnson and Laurens Counties is forested, and nearly 38 percent is used for row crops or pasture. Some of the forests are hardwoods, some are pine, and some are mixed pine and hardwoods. The cropland and woodland provide fair habitat for wildlife. Fish and wildlife are important in the counties because they provide opportunities for recreation and are resources that improve the local economy.

The major plant species of importance to terrestrial wildlife include greenbrier, bush and annual lespedezas, panicgrass, croton, ragweed, partridgepea, paspalum, tickclover, and sumac. The important overstory and understory woodland species are sweetgum, blackgum, cypress, oak, hickory, holly, blackberry, hackberry, buttonbush, and maple. Domestic species of importance to wildlife include peanuts, corn, soybeans, bahiagrass, and small grain.

Cropland and pasture are interspersed with pine plantations and hardwood forests in the survey area. They provide habitat for white-tailed deer, turkey, mourning dove, raccoon, gray squirrel, opossum, fox, and other wildlife. Rabbit and bobwhite quail populations are high in areas where suitable food and cover are available. Unmanaged pasture, old fields, young pine plantations, and thinned stands of woodland support numerous native woody and herbaceous plants that provide food and cover for white-tailed deer, turkey, rabbit, fox, quail, and other wildlife species.

Extensive clearing of woodland for row crops and the introduction of irrigation are decreasing the numbers of fish and wildlife. Removal of crop residue from fields, removal of hedgerows and unique areas in fields, and an increase in the extent of siltation result in a deterioration of the habitat for wildlife. Many of the chemicals used to increase agricultural production are harmful to small birds and animals. The most seriously affected game species is quail.

Wildlife habitat can be improved by restoring hedgerows, field borders, windbreaks, and unique areas in fields. The ability of pine plantations to support wildlife can be improved by retaining mast-producing trees, such as oak, wherever possible.

Wetlands provide habitat for a variety of furbearers, including otter, beaver, bobcat, and raccoon. Endangered alligator and waterfowl also inhabit the wetlands. The best wetland habitat is in the areas of hardwoods on the flood plains near the Oconee, Ohoopee, and Little Ohoopee Rivers and near Turkey, Rocky, and Alligator Creeks; in 10 Carolina bays; and on about 10,000 acres of beaver ponds. The counties have about 650 small ponds and about 616 miles of streams. The sport fish species that migrate up the rivers from the sea to breed in freshwater are striped bass, shad, and mullet. Because of the fragile habitat requirements of fish, special efforts are needed to restrict both point and nonpoint sources of water pollution in these counties.

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 10, 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 also are considerations. Examples of grain and seed crops are corn, wheat, rye, and peanuts.

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 also are considerations. Examples of grasses and legumes are lovegrass, bahiagrass, clover, lespedeza, 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 also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, lespedeza, partrigepea, threeawn, and composites.

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 hardwoods and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are plum, 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 and red cedar.

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, wild millet, wildrice, 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, waterfowl feeding areas, 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. Wildlife attracted to these areas include bobwhite quail, dove, 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, woodcock, thrushes, woodpeckers, squirrels, fox, raccoon, deer, and bear.

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, and beaver.

Engineering

John P. McEvoy, Jr., agricultural engineer, Soil Conservation Service, helped prepare this section.

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, and 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 must 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, 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 kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 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 a very firm dense layer, 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 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, and the shrink-swell potential can cause the movement of footings. A high water table and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 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. A high water table, flooding, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), the shrink-swell 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, and the available water capacity in the upper 40 inches 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 12 shows the degree and the 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 12 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 that 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, and flooding affect absorption of the effluent.

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 are 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 12 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, and flooding.

Excessive seepage resulting from rapid permeability in 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 can cause construction problems.

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 groundwater pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, a water table, slope, and flooding affect both types of landfill. Texture and soil reaction 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 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 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 13 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 to 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 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 the shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, and few cobbles and stones. 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 and a moderate shrink-swell potential. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10 and a high shrink-swell potential. They are wet, and depth to the water table is less than 1 foot. These soils 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 13, 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) and the thickness of suitable material. 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 as much as 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.

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

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 or soluble salts, or soils that have slopes dominantly 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 or soluble salts, 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 the content of plant nutrients.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. 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 the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, 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 in the soil 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 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. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, and susceptibility to flooding. Excavating and grading and the stability of ditchbanks are affected by slope and the hazard of cutbanks caving. 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 performance of a system is affected by the depth of the root zone and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. Restricted permeability adversely affects maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. Low available water capacity, restricted rooting depth, 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. These results are reported in table 21.

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 *(14)*. 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 classification, 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 15 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. Information on other properties of each layer is 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 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, SP-SM.

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. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 21.

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 generally are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterburg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 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, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated content of clay in 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 influence the soil's adsorption of cations, moisture retention, the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving 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 movement of water through the soil 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 in each major soil layer is stated in inches of water per inch of soil. 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.

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 some 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. Losses are expressed in tons per acre per year. These 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 0.02 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 over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained 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 17 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 are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a 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.

If a soil is assigned to two hydrologic groups in table 17, the first letter is for drained areas and the second is for undrained areas. Onsite investigation is needed to determine the hydrologic group of the soil in a particular area.

Flooding, the temporary covering of the 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 17 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable dates 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 (the chance of flooding is nearly 0 to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent 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 flooding is most likely is expressed in months. 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 that form in 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 17 are the depth to the seasonal high water table; the kind of water table, that is, *perched* 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 17.

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. 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.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

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 severely corrosive 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 also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Physical and Chemical Analyses of Selected Soils

The results of physical analysis of two pedons in the survey area are given in tables 19 and 20 and the results of chemical analysis in table 18. The data are for soils sampled at carefully selected sites. Soil samples were analyzed by the National Soil Survey Laboratory, Soil Conservation Service, Lincoln, Nebraska.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(15).*

Sand—(0.05-2.0 mm fraction) weight percentages of materials less than 2 mm (3A1).
Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all materials less than 2 mm (3A1).
Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of materials less than 2 mm (3A1).
Water retained—pressure extraction, percentage of ovendry weight of less than 2 mm material; ⅓ or 1/10 (3/10) bar (4B1), 15 bars (4B2).
Water-retention difference—between ⅓ bar and 15 bars for less than 2 mm material (4C1).
Moist bulk density—of less than 2 mm material, saran-coated clods (4A1).
Linear extensibility—change in clod dimension based on less than 2 mm material (4D).
Organic carbon—dichromate, ferric sulfate titration (6A1a).
Total nitrogen—semimicro Kjeldahl (6B2a).
Extractable cations—ammonium acetate pH 7.0, uncorrected; calcium (6N2), magnesium (602), sodium (6P2), potassium (6Q2).
Extractable acidity—barium chloride-triethanolamine II (6H2a).
Cation-exchange capacity—sum of cations (5A3a).
Cation-exchange capacity—ammonium acetate, pH 7.0 (5A6a).
Base saturation—ammonium acetate, pH 7.0 (5C1).
Base saturation—sum of cations, TEA, pH 8.2 (5C3).
Reaction (pH)—1:1 water dilution (8C1a).
Reaction (pH)—calcium chloride (8C1e).
Aluminum—potassium chloride extraction (6G).
Sesquioxides—dithionate-citrate extract; iron (6C2b), aluminum (6G7a).
Ratio to total clay—cation-exchange capacity and 15 bar water retention (8D1).
Cation-exchange capacity—sum of bases plus aluminum (5A3b).
Aluminum saturation—bases plus aluminum (5G1).
Potassium—atomic absorption (6Q3).
Iron—atomic absorption (6C7a).

Engineering Index Test Data

Table 21 shows laboratory test data for one pedon sampled at a carefully selected site in the survey area. The pedon is typical of the series and is described in the section "Soil Series and Their Morphology." The soil sample was tested by the Office of Materials and Research, Georgia Department of Transportation.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); and Plasticity index—T 90 (AASHTO), D 424 (ASTM).

Mineralogy of Selected Soils

The results of mineralogy analysis of typical subhorizons in several pedons in the survey area are available in the State Office of the Soil Conservation Service at Athens, Georgia. The subhorizons of the pedons are typical of the series. The methods used in obtaining the data accompany the results of the analysis. Soil samples were analyzed by the National Soil Survey Laboratory, Soil Conservation Service, Lincoln, Nebraska.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(16)*. 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 on laboratory measurements. Table 22 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven 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 Fluvaquents (*Fluv*, meaning flood plain, 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 Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, 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, siliceous, nonacid, thermic Typic Fluvaquents.

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. There can be some variation in the texture of the surface layer or of the substratum 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 (13)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (16)*. 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."

Ailey Series

The Ailey series consists of well drained soils that formed in sandy and loamy marine sediments on uplands. Permeability is rapid in the sandy epipedon,

moderate in the upper part of the subsoil, and slow in the rest of the subsoil and in the substratum. Slope is 2 to 8 percent.

Ailey soils are on the same landscape as Cowarts, Fuquay, and Troup soils. Cowarts soils are not in an arenic subgroup. Fuquay soils have 5 percent or more plinthite in the lower part of the subsoil. Troup soils are grossarenic.

Typical pedon of Ailey loamy sand, 2 to 5 percent slopes, 1.2 miles east on Georgia Highway 46 from the Dodge County line; 0.6 mile northwest on woods road; 50 feet northeast of road; Laurens County:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E—7 to 28 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable; few fine and medium roots; very strongly acid; clear wavy boundary.

Bt1—28 to 32 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bt2—32 to 39 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few fine and medium roots; few patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btx—39 to 46 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) and pale brown (10YR 6/3) and common medium prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; slightly hard and cemented, slightly sticky; few distinct clay films on faces of peds; firm in place, brittle in 25 percent, by volume; very strongly acid; gradual wavy boundary.

2C—46 to 65 inches; mottled yellowish brown (10YR 5/6), red (2.5YR 5/8), strong brown (7.5YR 5/6), and light gray (10YR 7/2) sandy clay loam; massive; compact in place; hard, slightly sticky; very strongly acid.

The thickness of the solum ranges from 42 to more than 65 inches. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The sandy epipedon is 22 to 30 inches thick. The Ap horizon is 5 to 8 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. The E horizon is 18 to 24 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 3 or 4.

The Bt horizon has hue of 10YR to 5YR, value of 5 or 6, and chroma of 4 to 8. It is sandy loam or sandy clay loam.

The Btx horizon has hue of 10YR to 5YR, value of 5 or 6, and chroma of 6 to 8. Some pedons have strong brown, pale brown, and red mottles. About 10 to 40 percent, by volume, of this horizon is brittle.

The 2C horizon commonly is mottled yellowish red, red, strong brown, yellowish brown, or light gray. It is sandy loam or sandy clay loam.

Americus Series

The Americus series consists of somewhat excessively drained, moderately rapidly permeable soils that formed in thick deposits of sandy marine sediments on uplands. Slope is 2 to 8 percent.

Americus soils are on the same landscape as Lakeland, Lucy, Red Bay, and Troup soils. The excessively drained Lakeland soils do not have an argillic horizon. The well drained Lucy soils are arenic. The well drained Red Bay soils are in a fine-loamy family. The well drained Troup soils are grossarenic.

Typical pedon of Americus loamy sand, 2 to 5 percent slopes, 10.8 miles northwest on Georgia Highway 57 from the center of Wrightsville; 500 feet south of highway; Johnson County:

Ap—0 to 6 inches; dark reddish brown (5YR 3/4) loamy sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

BE—6 to 11 inches; dark reddish brown (2.5YR 3/4) loamy sand; weak fine granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

Bt1—11 to 44 inches; dark red (2.5YR 3/6) loamy sand, red (2.5YR 4/6) dry; weak medium granular structure; friable; sand grains coated with clay; very strongly acid; gradual wavy boundary.

Bt2—44 to 75 inches; dark red (2.5YR 3/6) sandy loam, same color dry; weak medium subangular blocky structure; friable; sand grains coated with clay; very strongly acid.

The solum is 72 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 6 to 9 inches thick. It has hue of 5YR, value of 3, and chroma of 2 to 4 or hue of 7.5YR, value of 3, and chroma of 2.

The BE horizon has hue of 2.5YR or 5YR, value of 3, and chroma of 4 to 6. The Bt horizon has hue of 10R or 2.5YR, value of 3, and chroma of 4 to 6. It is loamy sand or sandy loam.

Carnegie Series

The Carnegie series consists of well drained, moderately slowly permeable soils on uplands. These soils formed in loamy and clayey marine sediments. Slope is 2 to 8 percent.

Carnegie soils are on the same landscape as Cowarts, Dothan, and Tifton soils. The associated soils are in a fine-loamy family. Cowarts soils have a solum that is thinner than that of the Carnegie soils and have less than 5 percent plinthite in the subsoil. Dothan and Tifton soils have 5 percent or more plinthite at a lower depth in the subsoil than the Carnegie soils. Also, Dothan soils have fewer nodules of ironstone.

Typical pedon of Carnegie sandy loam, 5 to 8 percent slopes, eroded, 6.1 miles northwest on Georgia Highway 57 from the center of Wrightsville; 100 feet south of road; Johnson County:

Apc—0 to 5 inches; dark brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; about 15 percent, by volume, medium and coarse rounded nodules of ironstone; strongly acid; abrupt smooth boundary.

Btc—5 to 18 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few faint clay films on faces of peds; about 8 percent coarse rounded nodules of ironstone; very strongly acid; gradual smooth boundary.

Btv1—18 to 32 inches; strong brown (7.5YR 5/8) sandy clay; common medium prominent red (2.5YR 4/8) and light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; slightly hard, firm, sticky; about 7 percent plinthite; common distinct clay films on faces of peds; about 3 percent coarse nodules of ironstone; very strongly acid; gradual wavy boundary.

Btv2—32 to 52 inches; mottled strong brown (7.5YR 5/6), red (2.5YR 5/8), yellowish brown (10YR 5/6), and light gray (10YR 7/2) sandy clay; moderate medium subangular blocky structure; hard, firm, sticky; about 6 percent plinthite; common prominent clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt—52 to 65 inches; mottled strong brown (7.5YR 5/8), red (2.5YR 4/6), and light gray (10YR 7/2) sandy clay; moderate medium subangular blocky structure; hard, firm, sticky; about 3 percent plinthite; common distinct clay films on faces of peds; very strongly acid.

The solum is 60 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Depth to the horizon containing 5 percent or more plinthite is 16 to 26 inches.

The A horizon is 4 to 5 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Nodules of ironstone make up 5 to 15 percent of the volume.

The Btc and Btv horizons have hue of 10YR, 7.5YR, or 5YR, value of 5, and chroma of 4, 6, or 8. The Btv horizon has common or many mottles in shades of red, brown, or gray. In some pedons nodules of ironstone make up 1 to 10 percent of this horizon. The content of plinthite ranges from 5 to 12 percent.

Chastain Series

The Chastain series consists of poorly drained, slowly permeable soils that formed in clayey and loamy sediments. These soils are on flood plains along the Oconee River. The water table commonly is within a depth of 1 foot from late fall to late spring. Slope is 0 to 2 percent.

Chastain soils are on the same landscape as Congaree, Herod, Muckalee, and Tawcaw soils. Herod and Muckalee soils are in a nonacid family that is fine-loamy or coarse-loamy. Tawcaw soils are somewhat poorly drained. Congaree soils are well drained or moderately well drained and are in a fine-loamy family.

Typical pedon of Chastain silty clay, in an area of Tawcaw-Chastain-Congaree association, frequently flooded; 0.6 mile northeast of woods road from the interchange of Interstate Highway 16 and Georgia Highway 19; on a flood plain along the Oconee River; Laurens County:

A—0 to 5 inches; dark brown (7.5YR 4/4) silty clay; weak fine granular and subangular blocky structure; friable; very strongly acid; clear smooth boundary.

Bw—5 to 13 inches; dark yellowish brown (10YR 4/4) silty clay loam; many medium distinct light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; few fine dark brown (7.5YR 3/4) manganese concretions; very strongly acid; clear smooth boundary.

Bg1—13 to 24 inches; light brownish gray (10YR 6/2) silty clay loam; common fine prominent strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few faint clay films on faces of some peds; few small black manganese concretions; common soft black

manganese coatings; very strongly acid; gradual wavy boundary.

Bg2—24 to 49 inches; light brownish gray (10YR 6/2) clay loam; common medium prominent strong brown (7.5YR 4/6) and many medium prominent yellowish brown (10YR 5/8) mottles; strong coarse prismatic structure that breaks to strong medium angular blocky; firm; faint clay films on faces of some peds; strongly acid; gradual wavy boundary.

Cg—49 to 72 inches; light brownish gray (10YR 6/2), yellowish brown (10YR 5/4), and brown (7.5YR 4/4), stratified sand, sandy loam, and clay; single grained and weak fine granular structure; loose and very friable; mildly alkaline.

The thickness of the solum ranges from 44 to more than 65 inches. The soils are very strongly acid or medium acid to a depth of 40 inches. They are slightly acid to mildly alkaline below that depth.

The A horizon is 4 to 6 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 to 4 or hue of 7.5YR, value of 4 to 6, and chroma of 2 to 4.

The Bg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 7. It has few to many mottles in shades of brown, yellow, or red. In some pedons it has few or common very fine to medium flakes of mica. This horizon is clay loam, silty clay loam, silty clay, or clay.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 4; hue of 2.5Y, value of 6 or 7, and chroma of 2; or hue of 7.5YR and value and chroma of 4. In some pedons it has few to many mottles in shades of brown or red. This horizon is stratified sand to clay.

The Chastain soils in this survey area are considered taxadjuncts to the series because they have kaolinitic mineralogy. Also, they are less acid below the control section than is defined as the range for the series. These differences, however, do not significantly affect the use and management of the soils.

Clarendon Series

The Clarendon series consists of moderately well drained soils that formed in loamy marine sediments on uplands. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The water table commonly is at a depth of 2 to 3 feet from late fall to mid spring. Slope is 0 to 2 percent.

Clarendon soils are on the same landscape as Dothan and Tifton soils. Dothan and Tifton soils are well drained and do not have gray mottles within a depth of 30 inches. Also, Tifton soils have nodules of ironstone on the surface and in the surface layer and the upper part of the subsoil.

Typical pedon of Clarendon loamy sand, 0 to 2 percent slopes, 1 mile west on Georgia Highway 57 from the intersection with U.S. Highway 441; about 60 feet south; Laurens County:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

E—7 to 12 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

Bt1—12 to 18 inches; light yellowish brown (10YR 6/4) sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; very strongly acid; gradual smooth boundary.

Bt2—18 to 30 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent light gray (10YR 7/1) and few fine faint pale brown mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine and medium roots; about 10 percent, by volume, is brittle and has high-chroma mottles; very strongly acid; gradual smooth boundary.

Btvx—30 to 48 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 5/8) and light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky; about 7 percent nodular plinthite; few distinct clay films on faces of peds; about 25 percent, by volume, is brittle and has high-chroma mottles; very strongly acid; gradual wavy boundary.

Btv—48 to 65 inches; coarsely mottled yellowish brown (10YR 5/8) and light gray (10YR 7/1) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; about 5 percent nodular plinthite; few distinct clay films on faces of peds; very strongly acid.

The solum is 72 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Depth to the horizon containing 5 percent or more plinthite is 20 to 48 inches.

The Ap horizon is 6 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4.

The Bt horizon has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 4, 6, or 8. It is sandy loam or sandy clay loam.

The Btx and Btvx horizons have hue of 10YR, value

of 5, and chroma of 6 to 8 and have mottles in shades of gray, brown, yellow, or red. About 10 to 25 percent of the volume of the Btx horizon is brittle. The Btvx and Btv horizons have 5 to 10 percent plinthite.

Congaree Series

The Congaree series consists of well drained or moderately well drained, moderately permeable soils that formed in loamy sediments. These soils are on flood plains along the Oconee River. The water table commonly is at a depth of 2.5 to 4.0 feet from late fall to mid spring. Slope is 0 to 2 percent.

Congaree soils are on the same landscape as Chastain and Tawcaw soils. The poorly drained Chastain soils and somewhat poorly drained Tawcaw soils are fine textured.

Typical pedon of Congaree loam, in an area of Tawcaw-Chastain-Congaree association, frequently flooded; 1.9 miles east on Interstate 16 from the intersection with Georgia Highway 19; about 300 feet south of the interstate; on a flood plain along the Oconee River; Laurens County:

A—0 to 6 inches; reddish brown (5YR 4/3) loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

C1—6 to 13 inches; reddish brown (5YR 4/4) silt loam; massive; friable; many fine roots and pores; medium acid; gradual wavy boundary.

C2—13 to 27 inches; dark brown (7.5YR 4/4) loam; common medium distinct pale brown (10YR 6/3) mottles; massive; slightly hard, friable, slightly sticky; few medium roots; few worm casts; few fine fragments of charcoal; medium acid; gradual wavy boundary.

C3—27 to 41 inches; yellowish brown (10YR 5/4) silt loam; few fine faint light yellowish brown mottles; massive; slightly hard, friable, slightly sticky; common fine flakes of mica; few black concretions; medium acid; gradual wavy boundary.

C4—41 to 48 inches; yellowish brown (10YR 5/4) fine sandy loam; few fine faint pale brown mottles; massive; slightly hard, friable, slightly sticky; common fine flakes of mica; strongly acid; clear smooth boundary.

C5—48 to 65 inches; dark brown (7.5YR 4/4) loamy sand; common medium distinct pale brown (10YR 6/3) mottles; massive; very friable; common fine flakes of mica; strongly acid.

The loamy sediments are 40 or more inches thick. The soils generally are strongly acid or medium acid, but some part of the profile within a depth of 40 inches is naturally medium acid.

The A horizon is 6 to 8 inches thick. It has hue of 5YR, value of 4, and chroma of 3 or 4 or hue of 7.5YR and value and chroma of 4.

The C horizon has hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 4 to 6. It is loam, silt loam, silty clay loam, or fine sandy loam to a depth of about 40 inches. It is stratified or has lenses of loamy sand, sandy loam, sandy clay loam, or silt loam below a depth of 40 inches. Some pedons have gray mottles at a depth of 20 inches or more and have common or many brownish or yellowish mottles.

Cowarts Series

The Cowarts series consists of well drained soils that are moderately permeable in the subsoil and moderately slowly or slowly permeable in the substratum. These soils formed in dominantly loamy marine sediments on uplands. Slope is 2 to 15 percent.

Cowarts soils are on the same landscape as Carnegie, Dothan, Nankin, and Susquehanna soils. Carnegie soils are in a clayey family, have 5 percent or more plinthite in the upper and middle parts of the subsoil, and have 5 percent or more nodules of ironstone in the surface layer and in the upper and middle parts of the subsoil. Dothan soils have 5 percent or more plinthite in the lower part of the subsoil. Nankin soils are in a clayey family. Susquehanna soils are somewhat poorly drained and are fine textured.

Typical pedon of Cowarts loamy sand, 2 to 5 percent slopes, 0.2 mile southeast of Georgia Highway 19 from Lowery Church; 2.7 miles southwest on county road; 40 feet southeast of road; Laurens County:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine and medium roots; common coarse rounded nodules of ironstone; few small quartz pebbles; strongly acid; abrupt smooth boundary.

Bt1—6 to 12 inches; yellowish brown (10YR 5/4) sandy loam; weak medium granular structure; friable; many fine and medium roots; few coarse rounded nodules of ironstone; common small quartz pebbles; strongly acid; gradual wavy boundary.

Bt2—12 to 21 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; common fine and medium roots; few distinct patchy clay films on faces of peds; few coarse rounded nodules of ironstone; very strongly acid; gradual wavy boundary.

Bt3—21 to 27 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/8) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; few distinct clay films on faces of peds; common small quartz pebbles; very strongly acid; gradual wavy boundary.
C—27 to 65 inches; mottled yellowish brown (10YR 5/6), light gray (10YR 7/2), red (2.5YR 4/8), and brownish yellow (10YR 6/6) sandy clay loam; massive; hard, firm, slightly sticky; very strongly acid.

The thickness of the solum ranges from 22 to 34 inches. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Some pedons contain nodules of ironstone, which make up about 5 percent of the A and B horizons.

The A horizon is 4 to 7 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2. It is loamy sand or sandy loam.

The Bt1 horizon has hue of 10YR, value of 5, and chroma of 4 to 6. It is sandy loam or sandy clay loam. The Bt2 horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 to 8. The Bt3 horizon has the same hue, value, and chroma as the Bt2 horizon, but in some pedons it has common or many reddish or brownish mottles. It is sandy clay loam or sandy clay.

The C horizon is mottled in shades of red, brown, yellow, or gray. It is coarse sandy loam, sandy loam, or sandy clay loam.

Dothan Series

The Dothan series consists of well drained soils that formed mainly in loamy marine sediments on uplands. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Slope is 0 to 8 percent.

Dothan soils are on the same landscape as Cowarts, Fuquay, Nankin, and Tifton soils. Cowarts soils have a solum that is thinner than that of the Dothan soils and that has less than 5 percent plinthite. Fuquay soils are arenic. Nankin soils have a clayey Bt horizon. Tifton soils have more nodules of ironstone throughout than the Dothan soils.

Typical pedon of Dothan loamy sand, 2 to 5 percent slopes, 0.6 mile east of the Ohoopee River on Georgia Highway 57; about 150 feet south of road; Johnson County:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; few coarse rounded nodules of ironstone; strongly acid; clear smooth boundary.
Bt1—6 to 13 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; very friable; common fine roots; strongly acid; gradual smooth boundary.
Bt2—13 to 30 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky; few fine roots; few distinct clay films on faces of peds; strongly acid; gradual wavy boundary.
Btv1—30 to 42 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium distinct strong brown (7.5YR 5/8) and common medium prominent yellowish red (5YR 4/8) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; about 5 percent nodular plinthite; common prominent clay films on faces of peds; strongly acid; gradual wavy boundary.
Btv2—42 to 65 inches; mottled yellowish brown (10YR 5/8), red (2.5YR 4/8), yellow (10YR 7/8), and light gray (10YR 7/2) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; about 9 percent plinthite; common prominent clay films on faces of peds; strongly acid.

The solum is 65 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Depth to the horizon that contains 5 percent or more plinthite is 24 to 48 inches.

The A horizon is 6 to 8 inches thick. It has hue of 10YR, value of 4, and chroma of 2 or 3. It is loamy sand or sandy loam. Nodules of ironstone make up 1 to 5 percent of this horizon.

The Bt1 horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8. The Bt2 and Btv horizons have hue of 7.5YR and 10YR and chroma of 6 to 8. The Btv horizon has common or many medium mottles in shades of strong brown or red and commonly has gray mottles in the lower part. The content of plinthite ranges from 5 to 10 percent in this horizon.

Faceville Series

The Faceville series consists of well drained, moderately permeable soils that formed mainly in clayey marine sediments on uplands. Slope is 2 to 10 percent.

Faceville soils are on the same landscape as Greenville, Orangeburg, and Red Bay soils. Greenville and Red Bay soils have a dominantly dark red subsoil. Red Bay and Orangeburg soils are in a fine-loamy family.

Typical pedon of Faceville sandy loam, 2 to 5 percent slopes, 1.1 miles southeast on Buckeye Road from the Johnson and Laurens County line; 0.3 mile northeast on county road; 70 feet north; Laurens County:

Ap—0 to 5 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; slightly hard, very friable; many fine roots; very strongly acid; abrupt smooth boundary.

Bt1—5 to 11 inches; red (2.5YR 4/8) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few fine roots; few distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—11 to 31 inches; red (2.5YR 4/6) sandy clay; moderate medium subangular blocky structure; hard, friable, sticky; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3—31 to 65 inches; red (2.5YR 4/8) sandy clay; moderate medium subangular blocky structure; hard, friable, sticky; common distinct clay films on faces of peds; strongly acid.

The solum is 65 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 4 to 7 inches thick. It has hue of 5YR to 10YR, value of 4, and chroma of 2 or 3.

The Bt horizon has hue of 2.5YR, value of 4 or 5, and chroma of 6 to 8 or hue of 5YR, value of 5, and chroma of 6 to 8. In some pedons the lower part of this horizon has few or common strong brown or yellowish brown mottles. The upper part of the Bt horizon is sandy clay loam or sandy clay, and the lower part is sandy clay or clay.

Fuquay Series

The Fuquay series consists of well drained soils that formed in sandy and loamy marine sediments on uplands. Permeability is moderately rapid in the sandy epipedon, moderate in the upper part of the subsoil, and slow in the rest of the subsoil. Slope is 0 to 8 percent.

Fuquay soils are on the same landscape as Ailey, Dothan, Lakeland, and Troup soils. Ailey soils have a Bx horizon. In Dothan soils the thickness of the A horizon combined with that of the E horizon is less than 20 inches. Lakeland soils are sandy throughout. Troup soils are grossarenic.

Typical pedon of Fuquay loamy sand, 0 to 5 percent slopes, 0.2 mile north of U.S. Highway 441 from the intersection with Interstate 16; about 350 feet northwest of highway; Laurens County:

Ap—0 to 5 inches; grayish brown (10YR 5/2) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

E—5 to 24 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bt1—24 to 29 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; slightly sticky, friable; strongly acid; gradual wavy boundary.

Bt2—29 to 37 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Btv1—37 to 45 inches; strong brown (7.5YR 5/6) sandy clay loam; common medium prominent yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; slightly hard, firm, slightly sticky; about 6 percent nodular plinthite; common distinct patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

Btv2—45 to 65 inches; strong brown (7.5YR 5/6) sandy clay loam; common medium prominent yellowish red (5YR 5/8) and light gray (10YR 7/1) mottles; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky; about 7 percent nodular plinthite; few distinct patchy clay films on faces of peds; strongly acid.

The solum is 80 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas. Depth to the horizon containing 5 percent or more plinthite is 35 to 50 inches.

The sandy epipedon is 24 to 35 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. The E horizon is 16 to 30 inches thick. It has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4.

The Bt1 horizon has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8. It is sandy loam or sandy clay loam. The Bt2 horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 6 to 8. The Btv horizon has the same hue, value, and chroma as the Bt2 horizon. It has mottles in shades of brown, red, or gray. The content of plinthite in the Btv horizon ranges from 5 to 10 percent.

Grady Series

The Grady series consists of poorly drained, slowly permeable soils that formed dominantly in clayey marine sediments on uplands. These soils commonly

are ponded or have a water table within a depth of 1 foot in winter and spring. Slope is 0 to 2 percent.

Grady soils are on the same landscape as Dothan, Faceville, Orangeburg, Rains, and Tifton soils. All of the associated soils, except for Rains soils, are well drained. The poorly drained Rains soils are in a fine-loamy family.

Typical pedon of Grady loam, ponded, 2 miles south from the intersection of U.S. Highway 441 and Interstate 16; about 0.9 mile northeast on county road; 800 feet southeast of road; Laurens County:

A—0 to 5 inches; very dark gray (10YR 3/1) loam; weak fine granular structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Btg1—5 to 9 inches; dark gray (10YR 4/1) sandy clay loam; few medium prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Btg2—9 to 27 inches; gray (10YR 5/1) clay; common medium prominent light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; hard, firm, very sticky; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—27 to 52 inches; gray (10YR 6/1) clay; moderate medium subangular blocky structure; hard, firm, very sticky; common prominent clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg4—52 to 65 inches; gray (10YR 6/1) clay; few fine prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; hard, firm, very sticky; common prominent clay films on faces of peds; very strongly acid.

The solum is 60 or more inches thick. The soils are very strongly acid or strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 4 or 5 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1.

The Btg horizon has hue of 10YR, value of 4 to 6, and chroma of 1. Some pedons have few to many mottles in shades of brown, yellow, or red. The upper part of this horizon is sandy clay loam or sandy clay, and the lower part is sandy clay or clay.

Greenville Series

The Greenville series consists of well drained, moderately permeable soils that formed dominantly in clayey marine sediments on uplands. Slope is 0 to 10 percent.

Greenville soils are on the same landscape as Faceville, Orangeburg, and Red Bay soils. Faceville and Orangeburg soils have a dominantly red B horizon. Also, Orangeburg soils are in a fine-loamy family. Red Bay soils have a dominantly dark red B horizon and are in a fine-loamy family.

Typical pedon of Greenville sandy loam, 2 to 5 percent slopes, 2 miles from the Johnson-Laurens County line on Buckeye Road; 2 miles south on woods road; 50 feet northwest; Johnson County:

Ap—0 to 6 inches; dark reddish brown (5YR 3/3) sandy loam; weak fine granular structure; very friable; many fine roots; few medium rounded iron and manganese nodules; strongly acid; abrupt smooth boundary.

Bt1—6 to 10 inches; dark reddish brown (2.5YR 3/4) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; many fine roots; few faint clay films on faces of peds; few medium rounded iron and manganese concretions; strongly acid; gradual wavy boundary.

Bt2—10 to 44 inches; dark red (2.5YR 3/6) sandy clay; moderate medium subangular blocky structure; hard, friable, sticky; common prominent clay films on faces of peds; few medium rounded iron and manganese concretions; strongly acid; gradual wavy boundary.

Bt3—44 to 65 inches; dark red (10R 3/6) sandy clay; moderate medium subangular blocky structure; hard, friable, very sticky; common distinct clay films on faces of peds; strongly acid.

The solum is 60 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 5 to 8 inches thick. It has hue of 5YR, value of 3, and chroma of 3 or 4. The Bt horizon has hue of 10R or 2.5YR, value of 3, and chroma of 4 to 6.

Herod Series

The Herod series consists of poorly drained, moderately permeable soils that formed in loamy alluvial sediments on flood plains. The water table commonly is at a depth of 0.5 foot to 1.5 feet from winter to early spring. Slope is 0 to 2 percent.

Herod soils are on the same landscape as Muckalee and Ochlockonee soils, which are in a coarse-loamy family. Ochlockonee soils are well drained.

Typical pedon of Herod sandy loam, in an area of Herod and Muckalee sandy loams, frequently flooded; 2.1 miles south on Georgia Highway 19 from Olivet

Church; 400 feet west of road; on a flood plain along Turkey Creek; Laurens County:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.
A2—4 to 9 inches; gray (10YR 5/1) sandy loam; few fine faint brownish yellow mottles; weak medium granular structure; friable; many fine roots; medium acid; clear wavy boundary.
Cg1—9 to 42 inches; gray (10YR 5/1) sandy clay loam; common medium prominent brownish yellow (10YR 6/6) mottles; massive; slightly hard, friable, slightly sticky; few medium roots; slightly acid; gradual wavy boundary.
Cg2—42 to 65 inches; gray (10YR 6/1) sandy loam; common medium prominent yellowish brown (10YR 5/6) mottles; massive; slightly hard, friable, slightly sticky; common thin strata of loamy sand; slightly acid.

The alluvial sediments are 60 or more inches thick. The soils generally are medium acid or slightly acid throughout, but the surface layer is strongly acid.

The A horizon is 4 to 9 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The Cg1 horizon has hue of 10YR, value of 5 or 6, and chroma of 1. It has few or common mottles in shades of yellow or brown. The Cg2 horizon has hue of 10YR, value of 5 to 7, and chroma of 1. It has few or common mottles in shades of brown.

Lakeland Series

The Lakeland series consists of excessively drained, very rapidly permeable soils that formed in sandy marine sediments on uplands. Slope is 0 to 15 percent.

Lakeland soils are on the same landscape as Ailey, Cowarts, Fuquay, and Troup soils. The associated soils are well drained. They have a loamy Bt horizon, a firm and brittle layer in the subsoil, or compact and hard underlying material. Ailey soils are arenic. Fuquay soils are arenic and contain plinthite. Troup soils are grossarenic.

Typical pedon of Lakeland sand, 0 to 8 percent slopes, 0.2 mile southeast on Georgia Highway 199 from the junction with Georgia Highway 29; about 0.7 mile south on county road; 0.7 mile southwest on woods road; 0.2 mile northwest on woods road and 150 feet northeast; Laurens County:

A—0 to 4 inches; very dark grayish brown (10YR 3/2) sand; single grained; loose; many fine roots; very strongly acid; clear smooth boundary.
C1—4 to 13 inches; yellowish brown (10YR 5/4) sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.
C2—13 to 63 inches; yellowish brown (10YR 5/8) sand; single grained; loose; few uncoated sand grains; very strongly acid; gradual wavy boundary.
C3—63 to 85 inches; yellowish brown (10YR 5/8) sand; few fine faint very pale brown mottles; single grained; loose; many uncoated sand grains; very strongly acid.

The sand is 80 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 3 to 6 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 3, 4, 6, or 8 or hue of 7.5YR or 5YR, value of 5 or 6, and chroma of 6 to 8. Few fine faint brownish mottles are below a depth of 50 inches in some pedons.

Lucy Series

The Lucy series consists of well drained soils that formed in sandy and loamy marine sediments on uplands. Permeability is rapid in the sandy epipedon, moderately rapid in the upper part of the subsoil, and moderate in the rest of the subsoil. Slope is 0 to 8 percent.

Lucy soils are on the same landscape as Faceville, Fuquay, and Orangeburg soils. Faceville and Orangeburg soils have a sandy epipedon that is less than 20 inches thick. Also, Faceville soils are in a clayey family. Fuquay soils have 5 percent or more plinthite in the lower part of the subsoil.

Typical pedon of Lucy loamy sand, 0 to 5 percent slopes, 1 mile southeast on U.S. Highway 80 from Montrose; 2.4 miles north on county paved road; 50 feet east of road; Laurens County:

Ap—0 to 6 inches; dark brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.
E—6 to 24 inches; yellowish brown (10YR 5/6) loamy sand; weak fine granular structure; very friable; few fine and medium roots; strongly acid; gradual smooth boundary.
Bt1—24 to 30 inches; yellowish red (5YR 5/8) sandy loam; weak fine subangular blocky structure; few fine and medium roots; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.
Bt2—30 to 42 inches; red (2.5YR 4/8) sandy clay loam; weak and moderate medium subangular blocky

structure; slightly hard, friable, slightly sticky; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—42 to 65 inches; red (2.5YR 4/8) sandy clay loam; few fine faint yellowish brown mottles; weak and moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; common distinct clay films on faces of peds; very strongly acid.

The solum is 60 or more inches thick. The sandy epipedon is strongly acid or medium acid unless the soils have been limed. The subsoil is strongly acid or very strongly acid.

The sandy epipedon is 22 to 28 inches thick. The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The E horizon is 15 to 22 inches thick. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6.

The upper part of the Bt horizon has hue of 5YR, value of 4 or 5, and chroma of 6 to 8. The lower part has hue of 2.5YR, value of 4 or 5, and chroma of 6 to 8; hue of 5YR, value of 4 or 5, and chroma of 6; or hue of 5YR, value of 5, and chroma of 8.

Marlboro Series

The Marlboro series consists of well drained, moderately permeable soils that formed dominantly in clayey marine sediments on uplands. Slope is 2 to 5 percent.

Marlboro soils are on the same landscape as Dothan, Faceville, and Tifton soils. Dothan and Tifton soils are in a fine-loamy family and contain 5 percent or more plinthite in the lower part of the subsoil. Faceville soils have a red subsoil.

Typical pedon of Marlboro sandy loam, 2 to 5 percent slopes, 2 miles northeast on Georgia Highway 319 from the intersection with U.S. Highway 80; about 0.1 mile west on county road; 100 feet south of road; Laurens County:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

BE—6 to 9 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; friable; few fine roots; strongly acid; clear smooth boundary.

Bt1—9 to 30 inches; yellowish brown (10YR 5/6) sandy clay; moderate medium subangular blocky structure; slightly hard, friable, sticky; few distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—30 to 52 inches; strong brown (7.5YR 5/6) sandy clay; common medium distinct yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; hard, friable, sticky; common prominent clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3—52 to 65 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 5/8), red (2.5YR 4/8), and light gray (10YR 7/2) sandy clay; moderate medium subangular blocky structure; hard, friable, sticky; common prominent clay films on faces of peds; strongly acid.

The solum is 65 or more inches thick. The surface layer is strongly acid or medium acid unless the soils have been limed. The subsoil is strongly acid or very strongly acid.

The A horizon is 5 to 7 inches thick. It has hue of 10YR, value of 4, and chroma of 2 or 3. Some pedons have a BE horizon, which has hue of 10YR, value of 5, and chroma of 4 to 6. The Bt horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 6 to 8. In some pedons the lower part of this horizon has few to many medium mottles in shades of red, brown, yellow, or gray.

Mascotte Series

The Mascotte series consists of poorly drained soils that formed in sandy and loamy marine sediments on uplands. Permeability generally is moderate. The water table commonly is at a depth of 1 foot or less from winter to mid spring. Slope is 0 to 2 percent.

Mascotte soils are on the same landscape as Pelham and Ocilla soils. The associated soils do not have a spodic horizon. Ocilla soils are somewhat poorly drained.

Typical pedon of Mascotte sand, 0.1 mile northwest on county road from Evergreen Church; 2.1 miles north on county road; 2.2 miles east on woods road; 0.1 mile west on woods road; 30 feet north; Laurens County:

A—0 to 6 inches; very dark gray (10YR 3/1) sand, weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E—6 to 11 inches; gray (10YR 5/1) sand; single grained; loose; many fine roots; very strongly acid; abrupt smooth boundary.

Bh1—11 to 18 inches; dark brown (5YR 3/3) sand; massive; weakly cemented; slightly hard, firm; few medium roots; very strongly acid; clear wavy boundary.

Bh2—18 to 22 inches; dark brown (7.5YR 4/4) sand; weak medium subangular blocky structure; weakly

cemented; slightly hard, firm; few medium roots; very strongly acid; gradual wavy boundary.
E′—22 to 30 inches; pale brown (10YR 6/3) sand; few fine faint brownish yellow mottles; single grained; loose; very strongly acid; gradual wavy boundary.
Btg1—30 to 34 inches; gray (10YR 6/1) sandy loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak medium granular structure; slightly hard, friable, slightly sticky; very strongly acid; gradual wavy boundary.
Btg2—34 to 51 inches; gray (10YR 6/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few faint clay films on faces of peds; very strongly acid.
Btg3—51 to 65 inches; light gray (10YR 7/1) sandy clay loam; common medium prominent strong brown (7.5YR 5/6) and few fine faint pale brown mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few faint clay films on faces of peds; very strongly acid.

The solum is 60 or more inches thick. The soils are very strongly acid or strongly acid throughout, except for the surface layer in limed areas. Depth to the Bh horizon is 10 to 18 inches. Depth to the Bt horizon is 28 to 32 inches.

The A horizon is 4 to 6 inches thick. It has hue of 10YR, value of 2 to 4, and chroma of 1. The E horizon has hue of 10YR, value of 5 or 6, and chroma of 1.

The Bh horizon has hue of 5YR, value of 3, and chroma of 2 or 3 or hue of 7.5YR, value of 3 or 4, and chroma of 2 to 4. The E′ horizon has hue of 10YR, value of 6 or 7, and chroma of 2 or 3. In some pedons it has brownish yellow mottles. The Btg horizon has hue of 10YR, value of 6 or 7, and chroma of 1. In some pedons it has yellowish brown, strong brown, or pale brown mottles.

Muckalee Series

The Muckalee series consists of poorly drained, moderately permeable soils that formed in loamy and sandy sediments on flood plains. The water table commonly is at a depth of 0.5 foot to 1.5 feet from late fall to early spring. Slope is 0 to 2 percent.

Muckalee soils are on the same landscape as Herod and Ochlockonee soils. Herod soils are in a fine-loamy family. Ochlockonee soils are well drained and are in an acid family.

Typical pedon of Muckalee sandy loam, in an area of Herod and Muckalee sandy loams, frequently flooded; 5 miles east on Interstate 16 from the intersection with Georgia Highway 338; about 400 feet north of the interstate; on a flood plain along Turkey Creek; Laurens County:

A—0 to 5 inches; very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.
Cg1—5 to 15 inches; gray (10YR 6/1) sandy loam; few fine faint yellowish brown mottles; massive; very friable; common fine roots; medium acid; clear wavy boundary.
Cg2—15 to 26 inches; light gray (10YR 7/1) loamy sand; common medium prominent yellow (10YR 7/6) mottles; massive; friable; few medium roots; medium acid; gradual wavy boundary.
Cg3—26 to 42 inches; light gray (10YR 7/1) loamy sand; common medium prominent yellowish brown (10YR 5/6) mottles; massive; friable; common thin strata of sandy loam; slightly acid; gradual wavy boundary.
Cg4—42 to 65 inches; gray (10YR 6/1) loamy sand; massive; very friable; common thin strata of sandy loam; slightly acid.

The loamy and sandy sediments are 80 inches or more thick. The soils generally are medium acid or slightly acid throughout, but the surface layer is strongly acid.

The A horizon is 4 to 6 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The C horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. In most pedons it has few or common mottles in shades of yellow or brown. It is loamy sand or sandy loam.

Nankin Series

The Nankin series consists of well drained soils that formed in dominantly clayey marine sediments on uplands. Permeability is moderate in the upper part of the subsoil, moderately slow in the rest of the subsoil, and moderate in the substratum. Slope is 2 to 8 percent.

Nankin soils are on the same landscape as Cowarts, Dothan, and Tifton soils. The associated soils are in a fine-loamy family. Dothan and Tifton soils have 5 percent or more plinthite in the lower part of the subsoil. Also, Tifton soils have 5 percent or more nodules of ironstone on the surface and in the upper part of the profile.

Typical pedon of Nankin loamy sand, 2 to 5 percent slopes, 8 miles southeast on Georgia Highway 15 from the center of Wrightsville; 0.3 mile south on county road; 130 feet east of road; Johnson County:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; many fine roots; strongly acid; clear smooth boundary.
BA—7 to 15 inches; yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; friable; common fine roots; strongly acid; gradual wavy boundary.
Bt1—15 to 30 inches; strong brown (7.5YR 5/8) sandy clay; moderate medium subangular blocky structure; slightly hard, friable, sticky; few fine roots; few distinct clay films on faces of peds; common fine pores; very strongly acid; gradual wavy boundary.
Bt2—30 to 42 inches; strong brown (7.5YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/6) mottles; moderate medium angular blocky structure; slightly hard, friable, slightly sticky; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.
C—42 to 65 inches; mottled yellowish brown (10YR 5/6), red (2.5YR 4/6), and light gray (10YR 7/1) sandy clay loam; massive; hard, firm, slightly sticky; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 5 to 8 inches thick. It has hue of 10YR, value of 4, and chroma of 2 or 3. Few or common fragments of ironstone and quartz gravel are in some pedons. This horizon is loamy sand or sandy loam.

The BA horizon has hue of 5YR or 10YR, value of 5, and chroma of 4 to 6. It is sandy loam or sandy clay loam. The Bt horizon has hue of 5YR or 7.5YR, value of 5, and chroma of 6 to 8. In some pedons it has common or many mottles in shades of red. In many pedons few or common light gray mottles are below a depth of 36 inches. Some pedons have a BC horizon, which is mottled in shades of brown, red, or gray.

The C horizon is mottled in shades of red, gray, or yellow. It is sandy clay loam or sandy loam that has strata of loamy sand.

Ochlockonee Series

The Ochlockonee series consists of well drained soils that formed in loamy sediments on flood plains. Permeability is moderate to a depth of 40 inches and moderately rapid below that depth. The water table commonly is at a depth of 3 to 5 feet from late fall to mid spring. Slope is 0 to 2 percent.

Ochlockonee soils are associated mainly with Faceville, Greenville, and Orangeburg soils and to a lesser extent with Herod and Muckalee soils. The poorly drained Herod and Muckalee soils are on flood plains. They are in a nonacid family. Faceville, Greenville, and Orangeburg soils are on uplands. They have an argillic horizon.

Typical pedon of Ochlockonee sandy loam, occasionally flooded, 3 miles northeast of Dudley on Georgia Highway 338; about 1.9 miles northwest on paved county road; 0.3 mile west on county road; 0.2 mile south of road; Laurens County:

A—0 to 8 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.
C1—8 to 13 inches; yellowish brown (10YR 5/4) sandy loam; medium fine granular structure; friable; few fine roots; very strongly acid; gradual wavy boundary.
C2—13 to 28 inches; brownish yellow (10YR 6/6) loamy fine sand; weak medium granular structure; friable; few medium roots; very strongly acid; gradual wavy boundary.
Ab—28 to 40 inches; very dark grayish brown (10YR 3/2) loam; weak medium granular structure; friable, slightly sticky; strongly acid; gradual wavy boundary.
C'1—40 to 52 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; friable; very strongly acid; gradual wavy boundary.
C'2—52 to 65 inches; yellowish brown (10YR 5/6) sandy loam; weak fine granular structure; friable; thin strata of dark brown (10YR 4/3) sandy loam; very strongly acid.

The loamy sediments are 40 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 5 to 10 inches thick. It has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2. The C horizon has hue of 10YR, value of 4 to 6, and chroma of 3, 4, or 6 or hue of 7.5YR or 2.5Y, value of 4 or 5, and chroma of 4 to 6. In some pedons it has strong brown or pale brown mottles. The Ab horizon has hue of 10YR, value of 3 or 4, and chroma of 2. The C' horizon has hue of 10YR, value of 4 or 5, and chroma of 4 to 6.

Ocilla Series

The Ocilla series consists of somewhat poorly drained soils that formed in sandy and loamy marine sediments on uplands. Permeability is moderately rapid or rapid in the sandy epipedon and moderate in the subsoil. The water table commonly is at a depth of 1.0

to 2.5 feet from winter to mid spring. Slope is 0 to 2 percent.

Ocilla soils are on the same landscape as Clarendon, Pelham, and Rains soils. Clarendon soils have plinthite in the subsoil. Pelham and Rains soils are poorly drained. Also, Rains soils have a sandy epipedon that is less than 20 inches thick.

Typical pedon of Ocilla loamy sand, 0 to 2 percent slopes, 0.2 mile southeast on Georgia Highway 109 from the intersection with Georgia Highway 29; about 0.7 mile south on county road; 0.1 mile southwest on woods road; 100 feet east; Laurens County:

Ap—0 to 5 inches; dark gray (10YR 4/1) loamy sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E1—5 to 13 inches; pale yellow (2.5Y 7/4) loamy sand; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

E2—13 to 24 inches; yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bt1—24 to 36 inches; brownish yellow (10YR 6/8) sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable, slightly sticky; very strongly acid; gradual wavy boundary.

Bt2—36 to 52 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium prominent light gray (10YR 7/1) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; sand grains coated and bridged with clay; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—52 to 65 inches; mottled strong brown (7.5YR 5/6), yellowish red (5YR 4/8), and light gray (10YR 7/1) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few faint clay films on faces of peds; very strongly acid.

The solum is 72 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The sandy epipedon is 22 to 29 inches thick. The A horizon is 4 to 6 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The E horizon is 16 to 26 inches thick. It has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2 to 4.

The Bt1 horizon has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8. It has few or common mottles in shades of gray. The Bt2 horizon has hue of 10YR, value of 5 or 6, and chroma of 6. It has few or common mottles in shades of gray, brown, or red. The Bt3 horizon is mottled in shades of brown, gray, or red. The Bt horizon is sandy loam or sandy clay loam.

Orangeburg Series

The Orangeburg series consists of well drained, moderately permeable soils that formed dominantly in loamy marine sediments on uplands. Slope is 0 to 17 percent.

Orangeburg soils are on the same landscape as Dothan, Faceville, Greenville, and Lucy soils. Dothan soils have a dominantly yellowish brown subsoil and have 5 percent or more plinthite in the lower part of the subsoil. Faceville and Greenville soils are in a clayey family. Also, Greenville soils have a dark red subsoil. Lucy soils are arenic.

Typical pedon of Orangeburg loamy sand, 2 to 5 percent slopes, 1.8 miles north on U.S. Highway 441 from the intersection with Georgia Highway 338; about 2.4 miles northeast on county paved road; 0.3 mile southeast on county paved road; 20 feet northeast of road; Laurens County:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

Bt1—6 to 10 inches; yellowish red (5YR 5/6) sandy loam; weak fine subangular blocky structure; very friable; many fine roots; strongly acid; clear smooth boundary.

Bt2—10 to 48 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; few fine roots in the upper part; many fine and medium pores; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—48 to 65 inches; red (2.5YR 4/8) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; common distinct clay films on faces of peds; very strongly acid.

The solum is 72 or more inches thick. The soils are very strongly acid or strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 6 to 8 inches thick. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. It is loamy sand or sandy loam.

The Bt1 horizon has hue of 10YR or 7.5YR and has value of 5 and chroma of 4, 6, or 8 or value and chroma of 4, or it has hue of 5YR, value of 4 or 5, and chroma of 6 to 8. It is sandy loam or sandy clay loam. The Bt2 and Bt3 horizons have hue of 5YR or 2.5YR, value of 4

or 5, and chroma of 6 to 8. In some pedons the Bt3 horizon has few or common mottles in shades of brown.

Pelham Series

The Pelham series consists of poorly drained soils that formed in sandy and loamy marine sediments on uplands and near drainageways. Permeability is rapid in the sandy epipedon and moderate in the subsoil. The water table commonly is at a depth of 0.5 foot to 1.5 feet from winter to mid spring. Slope is 0 to 2 percent.

Pelham soils are on the same landscape as Mascotte, Ocilla, and Rains soils. Mascotte soils have a spodic horizon. Ocilla soils are somewhat poorly drained. Rains soils have a sandy epipedon that is less than 20 inches thick.

Typical pedon of Pelham loamy sand, 1.5 miles east on Georgia Highway 46 from the Dodge County line; 4.4 miles southeast on county road; 0.3 mile southwest on county road; 0.2 mile northwest of road; Laurens County:

A—0 to 8 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

E—8 to 27 inches; gray (10YR 6/1) loamy sand; single grained; loose; many fine and medium roots in the upper part and common medium roots in the lower part; very strongly acid; clear wavy boundary.

Btg1—27 to 33 inches; gray (10YR 5/1) sandy loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; few medium roots; very strongly acid; gradual wavy boundary.

Btg2—33 to 48 inches; gray (10YR 6/1) sandy clay loam; common coarse prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; sand grains coated and bridged with clay; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—48 to 65 inches; gray (10YR 6/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; common distinct clay films on faces of peds; very strongly acid.

The solum is 70 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The sandy epipedon is 20 to 40 inches thick. The A horizon is 4 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1. The E horizon is 16 to 24 inches thick. It has hue of 10YR, value of 6, and chroma of 1 or 2 or hue of 2.5Y, value of 6, and chroma of 2.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In some pedons it has few to many mottles in shades of brown, yellow, or red throughout. It is sandy loam or sandy clay loam.

Rains Series

The Rains series consists of poorly drained, moderately permeable soils that formed in loamy marine sediments on uplands. The water table commonly is at a depth of 1 foot or less from late fall to mid spring. Slope is 0 to 2 percent.

Rains soils are associated with Grady, Herod, and Muckalee soils and are on the same landscape as Rains soils. Grady soils are in a clayey family. Herod and Muckalee soils are on flood plains. Also, Muckalee soils are in a coarse-loamy family.

Typical pedon of Rains sandy loam, 1.8 miles east on Interstate 16 from the intersection with Georgia Highway 199; about 150 feet north of the interstate; Laurens County:

A—0 to 6 inches; very dark gray (10YR 3/1) sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E—6 to 15 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; friable; many fine roots; very strongly acid; gradual wavy boundary.

Btg1—15 to 25 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) mottles: weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few medium roots; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—25 to 40 inches; gray (10YR 6/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) and yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few medium roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—40 to 51 inches; gray (10YR 6/1) sandy clay loam; many common prominent yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg4—51 to 65 inches; gray (10YR 6/1) clay loam; common medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; patchy clay films on faces of peds; very strongly acid.

The solum is 65 or more inches thick. The soils are very strongly acid or strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 5 to 7 inches thick. It has hue of 10YR, value of 3, and chroma of 1 or 2 or hue of 2.5Y, value of 3, and chroma of 2. The E horizon, if it occurs, is as much as 10 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 1 or 2.

The upper part of the Bt horizon has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 1 or 2. The lower part has hue of 10YR, value of 6 or 7, and chroma of 1. Few to many fine or medium mottles in shades of brown, red, or yellow are throughout the Bt horizon.

Red Bay Series

The Red Bay series consists of well drained, moderately permeable soils that formed in loamy marine sediments on uplands. Slope is 2 to 5 percent.

Red Bay soils are on the same landscape as Americus, Greenville, and Orangeburg soils. Americus soils are in a sandy family. Greenville soils are in a clayey family. Orangeburg soils have a dominantly red subsoil.

Typical pedon of Red Bay loamy sand, 2 to 5 percent slopes, 0.3 mile southeast on U.S. Highway 441 from the Laurens and Wilkinson County line; 1 mile west on county road; 30 feet south of road; Laurens County:

A—0 to 6 inches; dark reddish brown (5YR 3/4) loamy sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

Bt1—6 to 12 inches; dark reddish brown (2.5YR 3/4) sandy loam; weak fine granular structure; friable; few fine and medium roots; very strongly acid; gradual smooth boundary.

Bt2—12 to 48 inches; dark red (10R 3/6) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—48 to 75 inches; dark red (2.5YR 3/6) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few distinct clay films on faces of peds; very strongly acid.

The solum is 75 or more inches thick. The soils are strongly acid or very strongly acid throughout, except for the surface layer in limed areas.

The A horizon is 5 or 6 inches thick. It has hue of 5YR or 2.5YR, value of 3, and chroma of 2 to 4 or hue of 5YR and value and chroma of 3.

The upper part of the Bt horizon has hue of 2.5YR, value of 3, and chroma of 4 to 6. It is sandy loam or sandy clay loam. The lower part has hue of 10R or 2.5YR, value of 3, and chroma of 6.

Susquehanna Series

The Susquehanna series consists of somewhat poorly drained, very slowly permeable soils that formed in clayey marine sediments on uplands. These soils are wet during periods of heavy rainfall, but they do not have a water table within a depth of 6 feet. Slope is 2 to 12 percent.

Susquehanna soils are on the same landscape as the well drained Cowarts, Dothan, and Nankin soils. Cowarts soils are in a fine-loamy family and have a solum that is thinner than that of the Susquehanna soils. Dothan soils are in a fine-loamy family and have 5 percent or more plinthite in the lower part of the subsoil. Nankin soils are in a kaolinitic family.

Typical pedon of Susquehanna sandy loam, 2 to 5 percent slopes, 0.2 mile southwest on Georgia Highway 39 from the crossing of Pughes Creek; 40 feet northeast of road; Laurens County:

A—0 to 3 inches; very dark gray (10YR 3/1) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt wavy boundary.

Bt1—3 to 11 inches; yellowish red (5YR 5/6) clay; many fine prominent grayish brown (10YR 5/2) mottles; strong medium angular blocky structure; very hard, firm, very sticky; many fine and medium roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—11 to 32 inches; light brownish gray (10YR 6/2) clay; many medium prominent red (2.5YR 4/6) mottles; strong medium angular blocky structure; very hard, firm, very sticky; common medium roots; many prominent clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—32 to 65 inches; light gray (2.5YR 7/2) clay; common medium prominent pale yellow (5Y 7/4) and brownish yellow (10YR 6/6) mottles; strong medium angular blocky structure; very hard, firm, very sticky; many prominent clay films on faces of peds; very strongly acid.

The solum is 60 or more inches thick. The soils are

very strongly acid or strongly acid throughout, except for the surface layer in limed areas.

The A or Ap horizon is 3 to 5 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The upper part of the Bt horizon has hue of 5YR, value of 5, and chroma of 6 to 8 or hue of 5YR, value of 4, and chroma of 6. It has many or common mottles in shades of gray, red, brown, or yellow. The lower part has hue of 2.5Y or 10YR, value of 6 or 7, and chroma of 2. In some pedons it has many or common mottles in shades of gray, red, or yellow.

The Susquehanna soils in this survey area are considered taxadjuncts to the series because they are slightly more sandy in the control section than is defined as the range for the series. Also, the content of clay in the Bt3 horizon is higher. These differences, however, do not significantly affect the use and management of the soils.

Tawcaw Series

The Tawcaw series consists of somewhat poorly drained, slowly permeable soils that formed in clayey sediments on flood plains along the Oconee River. The water table commonly is at a depth of 1.5 to 2.5 feet from late fall to mid spring. Slope is 0 to 2 percent.

Tawcaw soils are on the same landscape as Chastain, Congaree, Herod, and Muckalee soils. Chastain, Herod, and Muckalee soils are poorly drained. Herod and Muckalee soils are in a nonacid family that is fine-loamy or coarse-loamy. Congaree soils are well drained or moderately well drained and are in a fine-loamy family.

Typical pedon of Tawcaw silty clay loam, in an area of Tawcaw-Chastain-Congaree association, frequently flooded; 2 miles east on Interstate 16 from the intersection with Georgia Highway 19; about 100 feet south of the interstate; on a flood plain along the Oconee River; Laurens County:

A—0 to 7 inches; reddish brown (5YR 4/3) silty clay loam; weak medium granular and subangular blocky structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Bw1—7 to 15 inches; dark brown (10YR 4/3) silty clay; few fine faint light yellowish brown mottles; weak fine subangular blocky structure; slightly hard, friable, slightly sticky; few fine and medium roots; few fine dark brown (7.5YR 3/4) accumulations; strongly acid; gradual wavy boundary.

Bw2—15 to 24 inches; brown (10YR 5/3) silty clay; common medium distinct light gray (10YR 7/2) mottles; weak fine subangular blocky structure; slightly hard, friable, slightly sticky; few medium roots; common black accumulations; very strongly acid; gradual wavy boundary.

Bw3—24 to 36 inches; light gray (10YR 7/2) silty clay; many medium distinct brown (10YR 5/3) mottles; weak fine subangular blocky structure; slightly hard, friable, slightly sticky; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bw4—36 to 65 inches; mottled pale brown (10YR 6/3), yellowish brown (10YR 5/6), and light gray (10YR 7/1) silty clay; weak fine subangular blocky structure; slightly hard, friable, slightly sticky; common fine flakes of mica; medium acid.

The solum is 52 or more inches thick. The soils generally are very strongly acid to slightly acid throughout. In some pedons in limed areas, however, the surface layer is neutral.

The A horizon is 5 to 9 inches thick. It has hue of 5YR or 10YR, value of 3 or 4, and chroma of 2 or 3 or hue of 7.5YR, value of 3 or 4, and chroma of 2.

The upper part of the Bw horizon has hue of 5YR or 10YR, value of 4 or 5, and chroma of 3 or 4 or hue of 7.5YR, value of 4 or 5, and chroma of 4. The lower part has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2. It has mottles in shades of brown, red, yellow, or gray. In some pedons it has fine flakes of mica. The Bw horizon is silty clay loam, silty clay, clay loam, or clay.

Tifton Series

The Tifton series consists of well drained soils that formed dominantly in loamy marine sediments on uplands. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Slope is 0 to 8 percent.

Tifton soils are on the same landscape as Carnegie, Dothan, and Marlboro soils. Carnegie soils are in a clayey family and are shallower to plinthite than the Tifton soils. Dothan soils have fewer nodules of ironstone than the Tifton soils. Marlboro soils are in a clayey family and have less than 5 percent nodules of ironstone and plinthite throughout.

Typical pedon of Tifton loamy sand, 2 to 5 percent slopes, 3 miles south on Georgia Highway 19 from the intersection with U.S. Highway 80; about 0.6 mile southwest on county road; 30 feet northwest; Laurens County:

Apc—0 to 6 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine roots; about 10 percent medium and coarse nodules of ironstone; strongly acid; abrupt smooth boundary.

Btc1—6 to 9 inches; yellowish brown (10YR 5/6) sandy

loam; weak fine subangular blocky structure; very friable; few fine roots; about 12 percent coarse nodules of ironstone; strongly acid; clear smooth boundary.

Btc2—9 to 20 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; sand grains coated and bridged with clay; few distinct clay films on faces of peds; about 10 percent coarse nodules of ironstone; very strongly acid; gradual wavy boundary.

Btc3—20 to 36 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; common distinct clay films on faces of peds; about 5 percent coarse rounded nodules of ironstone; very strongly acid; gradual wavy boundary.

Btv1—36 to 46 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky; few distinct clay films on faces of peds; about 6 percent nodular plinthite that is brittle in the red part; very strongly acid; gradual wavy boundary.

Btv2—46 to 65 inches; mottled yellowish brown (10YR 5/8), red (2.5YR 4/8), and light gray (10YR 7/1) sandy clay loam; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky; few distinct clay films on faces of peds; about 10 percent nodular plinthite that is brittle in the red part; very strongly acid.

The solum is 65 or more inches thick. The soils are very strongly acid or strongly acid throughout, except for the surface layer in limed areas. The depth to a horizon containing 5 percent or more plinthite is 32 to 44 inches.

The A horizon is 6 to 8 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Nodules of ironstone make up 5 to 15 percent of the volume.

The Bt horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4, 6, or 8. In some pedons the Btv1 and Btv2 horizons have common or many mottles in shades of red, brown, or gray. Nodules of ironstone make up 5 to 12 percent of the Btc horizon. The content of plinthite ranges from 6 to 15 percent in the Btv horizon.

Troup Series

The Troup series consists of well drained soils that formed in sandy and loamy marine sediments on uplands. Permeability is rapid in the sandy epipedon and moderate in the subsoil. Slope is 0 to 6 percent.

Troup soils are on the same landscape as Ailey, Cowarts, Dothan, Fuquay, and Lakeland soils. Ailey soils have a firm and brittle layer in the subsoil and are arenic. Dothan soils have a sandy epipedon that is less than 20 inches thick. Fuquay soils are arenic and have a loamy subsoil that contains plinthite. Lakeland soils are sandy throughout.

Typical pedon of Troup sand, 0 to 6 percent slopes, 1 mile east on U.S. Highway 80 from Scott; sand pit north of road; Johnson County:

A—0 to 3 inches; dark grayish brown (10YR 4/2) sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E1—3 to 18 inches; yellowish brown (10YR 5/6) sand; single grained; very friable; few fine and medium roots; many uncoated sand grains; very strongly acid; gradual wavy boundary.

E2—18 to 48 inches; brownish yellow (10YR 6/6) sand; single grained; very friable; few medium roots; many uncoated sand grains; very strongly acid; gradual wavy boundary.

E&Bt—48 to 72 inches; alternating layers of light yellowish brown (10YR 6/4) sand (E) 3 to 4 inches thick and strong brown (7.5YR 5/8) sandy loam (Bt) ¼ to ½ inch thick; single grained and very friable in the sand; weak medium subangular blocky structure and friable in the sandy loam; many uncoated sand grains; very strongly acid; gradual wavy boundary.

Bt—72 to 98 inches; yellowish red (5YR 5/8) sandy loam; weak medium subangular blocky structure; friable; very strongly acid.

The solum is 80 or more inches thick. The soils are very strongly acid or strongly acid throughout, except for the surface layer in limed areas.

The sandy epipedon is 42 to 72 inches thick. The A horizon is 2 to 4 inches thick. It has hue of 10YR, value of 3 to 6, and chroma of 2 to 4. The E horizon is 38 to 70 inches thick. It has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4, 6, or 8. It is sand or loamy sand. The Bt horizon has hue of 5YR to 10YR, value of 5, and chroma of 6 to 8.

Formation of the Soils

Soil characteristics are determined by the physical and mineralogical composition of the parent material; the climate under which the parent material accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material *(6)*. All five of these factors influence every soil, but the significance of each factor varies from place to place. Soil formation may be dominated by one factor in one area and by a different factor in another area.

The interrelationship among these five factors is complex. The effects of any one factor cannot be completely evaluated without reference to the effects of the other factors. It is convenient, however, to describe each factor separately and to indicate the probable effects of each.

Parent Material

Parent material is the unconsolidated mass in which soil forms. It is largely responsible for the chemical and mineralogical composition of the soil. Johnson and Laurens Counties are underlain by Coastal Plain sedimentary rock *(9)*. Sandy to clayey marine sediments overlie the rock.

The soils on uplands in the extreme northwest part of Laurens County formed in Irwinton Sand. The somewhat excessively drained Americus, excessively drained Lakeland, and well drained Faceville and Orangeburg soils on smooth, convex slopes are the main soils that formed in this sand. These soils generally are very gently sloping to strongly sloping. They have a brownish or reddish, sandy or loamy surface layer and a reddish, loamy or clayey subsoil, or they are dominantly brownish and sandy throughout.

The soils on uplands in the extreme northwest part of Johnson County and in some areas near Turkey Creek, Rocky Creek, and the Oconee River in Laurens County formed in Twiggs Clay. The well drained, dominantly very gently sloping to strongly sloping Dothan, Faceville, Orangeburg, and Tifton soils on smooth, convex slopes are the main soils that formed in this clay. Dothan and Tifton soils have a brownish, sandy or loamy surface layer and a brownish, loamy subsoil that is mottled in the middle and lower parts. Nodules of ironstone are on the surface and in the upper part of the profile. Faceville and Orangeburg soils have a brownish or reddish, sandy or loamy surface layer and a reddish, loamy or clayey subsoil.

The soils on uplands near Turkey Creek in the northwestern part of Laurens County formed in material weathered from Ocala Limestone. The well drained, dominantly very gently sloping to strongly sloping Faceville and Orangeburg soils on smooth, convex slopes are the main soils that formed in this material. These soils have a brownish or reddish, sandy or loamy surface layer and a reddish, loamy or clayey subsoil.

The soils on uplands near Turkey Creek, Rocky Creek, and the Oconee River in Laurens County formed in material weathered from Suwannee Limestone. The well drained, dominantly very gently sloping to strongly sloping Dothan, Faceville, Orangeburg, and Tifton soils on smooth, convex slopes are the main soils that formed in this material. Dothan and Tifton soils have a brownish, sandy or loamy surface layer and a brownish, loamy subsoil that is mottled in the middle and lower parts. Nodules of ironstone are on the surface and in the upper part of the profile. Faceville and Orangeburg soils have a brownish or reddish, sandy or loamy surface layer and a reddish, loamy or clayey subsoil.

The rest of the soils on uplands in the survey area formed in the Neogene Undifferentiated unit. The well drained, dominantly very gently sloping and gently sloping Cowarts, Dothan, Fuquay, Nankin, and Tifton soils are the main soils that formed in this material. Dothan, Fuquay, and Tifton soils are on smooth, convex slopes. Dothan and Tifton soils have a brownish, sandy or loamy surface layer and a brownish, loamy subsoil that is mottled in the middle and lower parts. Nodules of ironstone are on the surface and in the upper part of the profile. Fuquay soils are brownish throughout and have a sandy surface layer; a thick, sandy subsurface layer; and a brownish, loamy subsoil that is mottled in the middle and lower parts. Cowarts and Nankin soils are on irregular, convex slopes. Cowarts soils have a brownish, sandy or loamy surface layer; a brownish, loamy subsoil that is mottled in the lower part; and a

mottled, loamy, hard and firm underlying layer. Nankin soils have a brownish, sandy or loamy surface layer; a brownish, clayey subsoil that is mottled in the lower part; and a mottled, loamy underlying layer.

Alluvium is adjacent to all of the streams in the survey area. It is more recent than the parent material of the soils on uplands. The nearly level, poorly drained Herod and Muckalee soils are the main soils on the flood plains along the Ohoopee River in Johnson County and along Turkey Creek and Rocky Creek in Laurens County. They are dominantly grayish throughout. Herod soils generally are loamy, and Muckalee soils generally are sandy.

The nearly level Tawcaw, Chastain, and Congaree soils are the main soils on the flood plains along the Oconee River in Laurens County. The poorly drained Chastain soils are dominantly grayish and clayey. The somewhat poorly drained Tawcaw soils are clayey throughout. They are brownish in the upper part and dominantly grayish in the lower part. The well drained or moderately well drained Congaree soils are dominantly brownish and loamy throughout.

Plants and Animals

The role of plants, animals, and other organisms is significant in soil formation. Plants and animals increase the content of organic matter and nitrogen, increase or decrease the content of plant nutrients, and change soil structure and porosity.

Plants recycle nutrients, add organic matter to the soil, and provide food and cover for animals. They stabilize the surface layer so that soil-forming processes can continue. They also provide a more stable environment for soil-forming processes by protecting the soils from extremes in temperature. The soils in the survey area formed under a succession of briers, brambles, and woody plants that yielded to pines and hardwoods. Later, the hardwoods suppressed most other plants and became the climax vegetation.

Animals rearrange soil material by roughening the surface, forming and filling channels, and shaping the peds and voids. The soil material is mixed by ants, wasps, worms, and spiders, which make channels; by crustacea, such as crabs and crayfish; and by turtles and foxes, which dig burrows. Bacteria, fungi, and other micro-organisms hasten the decomposition of organic matter and the release of plant nutrients. Humans affect the soil-forming processes by tilling the soils, removing the natural vegetation and establishing different plants, and reducing or increasing the level of fertility.

The relationship between plants and animals and climate and parent material is very close. The net gains and losses caused by plants and animals are important in the survey area, but the soils do not differ significantly only because of the role of plants and animals.

Climate

The climate in the survey area is probably similar to the one that prevailed when the soils formed. The most important climatic factors are a relatively high amount of annual rainfall and warm temperatures, which accelerate soil formation.

Water from precipitation is essential in soil formation. It dissolves soluble material and is used by plants and animals. It transports material from one part of the soil to another or from one area to another.

The soils in the survey area formed under a thermic temperature regime. The mean soil temperature at a depth of about 20 inches is 59 to 72 degrees F. Based on the mean annual air temperature, the estimated soil temperature in the survey area is about 68 degrees F. To some extent, temperature determines the rate of chemical reactions and other processes in the soil. Also, it affects the kind and amount of vegetation and organic matter and the rate at which the organic matter decomposes.

Relief

Relief affects the color of the soil, the degree of wetness, the thickness of the A horizon, the content of organic matter, and the plant cover. It has especially affected the color and wetness of the soils in this survey area.

Dothan and Tifton soils have a dominantly yellowish brown subsoil, whereas Pelham and Rains soils have a dominantly gray subsoil. This difference in color results from a difference in relief and a corresponding difference in internal drainage. The Dothan and Tifton soils are higher on the landscape than the Pelham and Rains soils. Also, they are better drained and therefore have a subsoil that is better oxidized and browner.

The movement of water across the surface and through the soil is controlled to a large extent by relief. Surface water, which commonly carries solid particles, causes erosion or deposition, depending on the kind of relief. In the more sloping areas, more water runs off the surface and less water enters the soil. As a result, the soils are drier. The soils in the lower areas commonly are wetter because they receive surface and subsurface water from the higher lying soils.

Time

The length of time that soil-forming factors act on the parent material largely determines the characteristics of

the soils. Most of the soils in the survey area are considered mature. A mature soil is in equilibrium with the environment. It is characterized by readily recognized pedogenic horizons and a regular decrease in content of carbon with increasing depth. Some areas of Dothan and Tifton soils are on broad, stable landscapes where the soil-forming processes have been active for thousands of years. These mature soils have a thick solum and a well expressed zone of illuviaton.

Herod and Muckalee soils annually receive sediments from floodwater. These stratified soils are not old enough to have a zone of illuviaton. Young soils do not have pedogenic horizons. The content of carbon in these soils decreases irregularly with increasing depth.

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Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

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

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.

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.

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, i.e., clay coating, clay skin.

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.

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.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. 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.

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.

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.

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.

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.

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, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay are in the soil. The soil is not a source of gravel or sand for construction purposes.

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.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

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.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual.* The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an 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 accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

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 A or B 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, the Arabic numeral 2 precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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.

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

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 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.

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.

Low strength. The soil is not strong enough to support loads.

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).

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.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is measured as the number of inches per hour that water moves 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). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range in 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.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of the 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
Medium 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

Relief. The elevations or inequalities of a land surface, considered collectively.

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.

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.

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.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

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 substratum. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

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.

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.

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.

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. The slope classes in this survey area are as follows:

Nearly level	0 to 2 percent slopes
Very gently sloping	2 to 5 percent slopes
Gently sloping	5 to 8 percent slopes
Strongly sloping	8 to 12 percent slopes
Moderately steep	12 to 17 percent slopes

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

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.

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.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the substratum. The living roots and plant and animal activities are largely confined to the solum.

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).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

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.

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

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."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

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.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-81 at Dublin, Georgia)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	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---	58.5	34.5	46.5	80	12	126	4.16	2.01	6.01	8	0.0
February--	61.9	36.0	49.0	81	17	124	4.62	2.32	6.61	7	.5
March-----	69.9	42.7	56.3	88	24	231	4.86	2.15	7.17	8	.0
April-----	79.1	50.9	65.0	92	34	450	3.49	1.90	4.88	6	.0
May-------	86.0	58.7	72.4	98	42	694	3.63	1.83	5.19	7	.0
June------	91.7	65.6	78.7	102	52	861	3.99	2.31	5.48	7	.0
July------	93.6	68.6	81.1	102	59	964	4.39	2.31	6.21	8	.0
August----	93.2	67.5	80.4	102	58	942	4.42	1.88	6.56	7	.0
September-	88.2	62.8	75.5	99	47	765	3.49	1.13	5.42	6	.0
October---	79.3	50.0	64.7	93	31	456	2.23	.40	3.64	4	.0
November--	69.6	40.7	55.2	85	21	192	2.38	1.01	3.53	4	.0
December--	61.1	35.3	48.2	81	15	100	3.75	1.91	5.34	7	.0
Yearly:											
Average	77.7	51.1	64.4	---	---	---	---	---	---	---	---
Extreme	---	---	---	104	11	---	---	---	---	---	---
Total---	---	---	---	---	---	5,905	45.41	37.93	52.54	79	.5

* 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 (50 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-81 at Dublin, Georgia)

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. 14	Mar. 27	Apr. 5
2 years in 10 later than--	Mar. 4	Mar. 19	Mar. 31
5 years in 10 later than--	Feb. 12	Mar. 5	Mar. 21
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 12	Nov. 4	Oct. 26
2 years in 10 earlier than--	Nov. 19	Nov. 9	Oct. 30
5 years in 10 earlier than--	Dec. 1	Nov. 19	Nov. 6

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-81 at Dublin, Georgia)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	252	231	209
8 years in 10	266	241	216
5 years in 10	291	258	229
2 years in 10	317	276	243
1 year in 10	330	285	250

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Johnson County	Laurens County	Total-- Area	Extent
		Acres	Acres	Acres	Pct
AeB	Ailey loamy sand, 2 to 5 percent slopes	1,065	6,330	7,395	1.0
AeC	Ailey loamy sand, 5 to 8 percent slopes	4,260	11,945	16,205	2.3
AmB	Americus loamy sand, 2 to 5 percent slopes	660	730	1,390	0.2
AmC	Americus loamy sand, 5 to 8 percent slopes	280	570	850	0.1
CaB2	Carnegie sandy loam, 2 to 5 percent slopes, eroded	925	5,185	6,110	0.8
CaC2	Carnegie sandy loam, 5 to 8 percent slopes, eroded	715	2,520	3,235	0.4
CnA	Clarendon loamy sand, 0 to 2 percent slopes	3,250	12,415	15,665	2.2
CoB	Cowarts loamy sand, 2 to 5 percent slopes	14,825	22,265	37,090	5.2
CtC2	Cowarts sandy loam, 5 to 8 percent slopes, eroded	3,955	6,330	10,285	1.4
CtD2	Cowarts sandy loam, 8 to 15 percent slopes, eroded	1,385	2,275	3,660	0.5
DoA	Dothan loamy sand, 0 to 2 percent slopes	1,615	6,465	8,080	1.1
DoB	Dothan loamy sand, 2 to 5 percent slopes	22,785	49,015	71,800	10.0
DtC2	Dothan sandy loam, 5 to 8 percent slopes, eroded	575	1,400	1,975	0.3
FaB	Faceville sandy loam, 2 to 5 percent slopes	3,370	10,965	14,335	2.0
FaC2	Faceville sandy loam, 5 to 10 percent slopes, eroded	640	3,310	3,950	0.5
FuB	Fuquay loamy sand, 0 to 5 percent slopes	22,370	54,510	76,880	10.7
FuC	Fuquay loamy sand, 5 to 8 percent slopes	1,015	1,480	2,495	0.3
Gr	Grady loam, ponded	495	3,255	3,750	0.5
GsA	Greenville sandy loam, 0 to 2 percent slopes	0	300	300	*
GsB	Greenville sandy loam, 2 to 5 percent slopes	690	1,335	2,025	0.3
GsC	Greenville sandy loam, 5 to 10 percent slopes	235	305	540	0.1
HM	Herod and Muckalee sandy loams, frequently flooded	36,605	76,955	113,560	15.9
LaB	Lakeland sand, 0 to 8 percent slopes	4,230	7,095	11,325	1.6
LaD	Lakeland sand, 8 to 15 percent slopes	500	595	1,095	0.2
LuB	Lucy loamy sand, 0 to 5 percent slopes	925	2,880	3,805	0.5
LuC	Lucy loamy sand, 5 to 8 percent slopes	190	535	725	0.1
MaB	Marlboro sandy loam, 2 to 5 percent slopes	800	4,360	5,160	0.7
Ms	Mascotte sand	0	350	350	*
NaB	Nankin loamy sand, 2 to 5 percent slopes	35,855	35,225	71,080	9.9
NkC2	Nankin sandy loam, 5 to 8 percent slopes, eroded	1,140	18,090	19,230	2.7
Oc	Ochlockonee sandy loam, occasionally flooded	290	1,235	1,525	0.2
Od	Ocilla loamy sand, 0 to 2 percent slopes	1,220	5,065	6,285	0.9
OrA	Orangeburg loamy sand, 0 to 2 percent slopes	580	2,470	3,050	0.4
OrB	Orangeburg loamy sand, 2 to 5 percent slopes	4,845	19,520	24,365	3.4
OrE	Orangeburg loamy sand, 12 to 17 percent slopes	300	650	950	0.1
OsC2	Orangeburg sandy loam, 5 to 8 percent slopes, eroded	2,285	7,815	10,100	1.4
OsD2	Orangeburg sandy loam, 8 to 12 percent slopes, eroded	1,595	5,535	7,130	1.0
Pe	Pelham loamy sand	210	2,430	2,640	0.4
Ra	Rains sandy loam	2,645	11,275	13,920	1.9
ReB	Red Bay loamy sand, 2 to 5 percent slopes	235	865	1,100	0.2
SuB	Susquehanna sandy loam, 2 to 5 percent slopes	2,065	5,450	7,515	1.0
SuC	Susquehanna sandy loam, 5 to 12 percent slopes	1,075	3,500	4,575	0.6
TC	Tawcaw-Chastain-Congaree association, frequently flooded	250	21,515	21,765	3.0
TfA	Tifton loamy sand, 0 to 2 percent slopes	345	5,380	5,725	0.8
TfB	Tifton loamy sand, 2 to 5 percent slopes	7,295	50,905	58,200	8.1
TnC2	Tifton sandy loam, 5 to 8 percent slopes, eroded	420	2,920	3,340	0.5
TrB	Troup sand, 0 to 6 percent slopes	9,100	22,600	31,700	4.4
Ud	Udorthents, loamy	40	515	555	0.1
	Water	80	380	460	0.1
	Total	200,230	519,015	719,245	100.0

* Less than 0.1 percent.

TABLE 5.--IMPORTANT FARMLAND

(Acreage is according to date field work was complete. Soils not listed do not qualify as prime farmland or as additional land of statewide importance)

Soil name and map symbol	Prime farmland	Additional farmland of statewide importance
AeB---- Ailey	---	7,395
AeC---- Ailey	---	16,205
AmB---- Americus	---	1,390
AmC---- Americus	---	850
CaB2---- Carnegie	6,110	---
CaC2---- Carnegie	---	3,235
CnA---- Clarendon	15,665	---
CoB---- Cowarts	37,090	---
CtC2---- Cowarts	---	10,285
DoA---- Dothan	8,080	---
DoB---- Dothan	71,800	---
DtC2---- Dothan	1,975	---
FaB---- Faceville	14,335	---
FaC2---- Faceville	---	3,950
FuB---- Fuquay	---	76,880
FuC---- Fuquay	---	2,495
GsA---- Greenville	300	---
GsB---- Greenville	2,025	---
GsC---- Greenville	---	540

TABLE 5.--IMPORTANT FARMLAND--Continued

Soil name and map symbol	Prime farmland	Additional farmland of statewide importance
LuB---------- Lucy	---	3,805
LuC---------- Lucy	---	725
MaB---------- Marlboro	5,160	---
NaB---------- Nankin	71,080	---
NkC2---------- Nankin	---	19,230
Oc---------- Ochlockonee	---	1,525
Od---------- Ocilla	---	6,285
OrA---------- Orangeburg	3,050	---
OrB---------- Orangeburg	24,365	---
OsC2---------- Orangeburg	10,100	---
OsD2---------- Orangeburg	---	7,130
ReB---------- Red Bay	1,100	---
SuB---------- Susquehanna	---	7,515
TfA---------- Tifton	5,725	---
TfB---------- Tifton	58,200	---
TnC2---------- Tifton	3,340	---
TrB---------- Troup	---	31,700
Total---------	339,500	201,140

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. 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		Corn		Soybeans		Wheat		Cotton		Peanuts		Improved bermudagrass		Bahiagrass	
	N	I	N	I	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu	Lbs	Lbs	Lbs	Lbs	AUM*	AUM*	AUM*	AUM*
AeB---- Ailey	IIIs	---	50	80	20	24	25	30	400	500	2,300	3,100	6.0	7.0	6.0	---
AeC---- Ailey	IVs	---	45	70	18	22	23	28	350	400	2,000	2,700	5.0	6.0	5.0	---
AmB---- Americus	IIIs	---	60	180	25	40	31	50	400	650	2,200	3,650	7.0	9.5	7.0	---
AmC---- Americus	IVs	---	55	165	20	32	25	40	350	550	2,000	3,300	6.5	8.0	6.5	---
CaB2---- Carnegie	IIIe	---	65	105	30	35	38	46	500	600	3,200	4,300	6.5	8.5	7.0	---
CaC2---- Carnegie	IVe	---	55	90	25	30	31	37	400	500	2,600	3,500	6.0	7.5	6.5	---
CnA---- Clarendon	IIw	---	125	200	45	54	56	67	700	850	---	---	10.5	13.0	10.0	---
CoB---- Cowarts	IIe	---	80	130	35	42	44	53	650	800	2,400	3,250	8.0	10.5	7.5	---
CtC2---- Cowarts	IVe	---	60	95	20	24	25	30	500	600	1,600	2,150	7.0	9.0	7.0	---
CtD2---- Cowarts	VIe	---	---	---	---	---	---	---	---	---	---	---	6.5	8.0	6.5	---
DoA---- Dothan	I	---	120	190	40	48	50	60	900	1,100	3,800	5,150	10.5	14.0	9.0	---
DoB---- Dothan	IIe	---	120	190	35	42	44	53	900	1,100	3,600	4,850	10.5	14.0	9.0	---
DtC2---- Dothan	IVe	---	90	145	25	30	31	37	700	850	3,000	4,050	9.5	12.0	7.0	---
FaB---- Faceville	IIe	---	115	185	45	54	56	67	875	1,050	4,000	5,400	10.0	13.5	7.0	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability		Corn		Soybeans		Wheat		Cotton		Peanuts		Improved bermudagrass		Bahiagrass	
	N	I	N	I	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu	Lbs	Lbs	Lbs	Lbs	AUM*	AUM*	AUM*	AUM*
FaC2--Faceville	IIIe	---	85	135	25	30	31	37	550	650	2,800	3,800	8.5	10.5	5.5	---
FuB--Fuquay	IIs	---	85	150	30	40	38	51	650	850	2,900	4,350	7.5	10.0	8.5	---
FuC--Fuquay	IIIs	---	75	140	25	33	31	41	600	800	2,600	3,900	7.0	9.5	8.5	---
Gr--Grady	Vw	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GsA--Greenville	I	---	115	185	45	54	56	67	875	1,050	4,000	5,400	10.0	13.5	7.0	---
GsB--Greenville	IIe	---	115	185	45	54	56	67	875	1,050	4,000	5,400	10.0	13.5	7.0	---
GsC--Greenville	IIIe	---	85	135	25	30	31	37	650	800	3,000	4,050	9.5	12.5	6.0	---
HM--Herod and Muckalee	Vw	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LaB--Lakeland	IVs	---	55	165	20	32	25	40	450	700	2,000	3,300	7.0	9.5	7.0	---
LaD--Lakeland	VIs	---	---	---	---	---	---	---	---	---	---	---	6.5	---	6.5	---
LuB--Lucy	IIs	---	80	150	33	44	41	55	650	850	3,000	4,500	8.0	10.5	8.5	---
LuC--Lucy	IIIs	---	70	130	25	33	31	41	600	800	2,500	3,750	7.5	10.0	8.5	---
MaB--Marlboro	IIe	---	115	185	45	54	56	67	875	1,050	4,000	5,400	10.0	13.5	7.0	---
Ms--Mascotte	IVw	---	---	---	---	---	---	---	---	---	---	---	---	---	8.0	---
NaB--Nankin	IIe	---	75	120	30	36	38	46	600	700	2,200	3,000	9.0	12.0	7.0	---
NkC2--Nankin	IVe	---	50	80	20	24	25	30	450	550	1,400	1,900	6.0	8.0	6.0	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability		Corn		Soybeans		Wheat		Cotton		Peanuts		Improved bermudagrass		Bahiagrass	
	N	I	N	I	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu	Lbs	Lbs	Lbs	Lbs	AUM*	AUM*	AUM*	AUM*
Oc---------- Ochlockonee	IIw	---	110	175	40	48	50	60	900	1,100	3,800	5,150	10.0	13.5	8.5	---
Od---------- Ocilla	IIIw	---	75	140	35	47	44	59	---	---	---	---	8.5	11.5	7.5	---
OrA---------- Orangeburg	I	---	120	190	45	54	56	67	900	1,100	4,000	5,400	10.5	14.0	8.5	---
OrB---------- Orangeburg	IIe	---	120	190	45	54	56	67	900	1,100	4,000	5,400	10.5	14.0	8.5	---
OrE---------- Orangeburg	VIe	---	---	---	---	---	---	---	---	---	---	---	8.0	---	6.0	---
OsC2---------- Orangeburg	IIIe	---	85	135	35	42	44	53	700	850	2,800	3,800	10.0	12.5	8.0	---
OsD2---------- Orangeburg	IVe	---	75	---	30	---	38	---	600	---	2,600	---	9.0	---	7.0	---
Pe---------- Pelham	Vw	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ra---------- Rains	IIIw	---	110	175	40	48	50	60	---	---	---	---	11.0	14.5	10.0	---
ReB---------- Red Bay	IIe	---	120	190	45	54	56	67	900	1,100	4,000	5,400	10.5	14.0	8.5	---
SuB---------- Susquehanna	IVe	---	---	---	---	---	---	---	---	---	---	---	---	---	6.5	---
SuC---------- Susquehanna	VIe	---	---	---	---	---	---	---	---	---	---	---	---	---	5.5	---
TC:																
Tawcaw----------	VIw	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chastain----------	VIw	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Congaree----------	IIIw	---	140	225	40	48	50	60	---	---	---	---	10.0	13.5	9.0	---
TfA---------- Tifton	I	---	115	185	46	55	58	70	950	1,150	3,800	5,150	10.5	14.0	8.5	---
TfB---------- Tifton	IIe	---	115	185	46	55	58	70	950	1,150	3,800	5,150	10.5	14.0	8.5	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability		Corn		Soybeans		Wheat		Cotton		Peanuts		Improved bermudagrass		Bahiagrass	
	N	I	N	I	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu	Lbs	Lbs	Lbs	Lbs	AUM*	AUM*	AUM*	AUM*
TnC2---------- Tifton	IIIe	---	80	130	34	41	43	52	650	800	3,000	4,050	9.0	11.5	7.0	---
TrB---------- Troup	IIIs	---	60	180	25	40	31	50	500	800	2,200	3,650	7.5	10.0	7.2	---
Ud**. Udorthents																

* 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.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

(Miscellaneous areas are excluded. Dashes indicate no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I:				
Johnson County	2,540	---	---	---
Laurens County	14,615	---	---	---
II:				
Johnson County	117,535	90,700	3,540	23,295
Laurens County	265,495	194,455	13,650	57,390
III:				
Johnson County	20,437	4,505	3,902	12,030
Laurens County	70,776	19,535	19,566	31,675
IV:				
Johnson County	18,815	10,045	---	8,770
Laurens County	59,285	39,325	350	19,610
V:				
Johnson County	37,310	---	37,310	---
Laurens County	82,640	---	82,640	---
VI:				
Johnson County	3,473	2,760	213	500
Laurens County	25,309	6,425	18,289	595

TABLE 8.--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: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
AeB, AeC---------- Ailey	8S	Slight	Moderate	Moderate	Slash pine----------	70	8	Slash pine, longleaf pine.
					Longleaf pine--------	60	4	
AmB, AmC---------- Americus	11S	Slight	Moderate	Moderate	Slash pine----------	84	11	Slash pine, longleaf pine.
					Loblolly pine--------	84	8	
					Longleaf pine--------	70	6	
CaB2, CaC2--------- Carnegie	9A	Slight	Slight	Slight	Loblolly pine--------	86	9	Loblolly pine, slash pine.
					Slash pine----------	86	11	
					Longleaf pine--------	72	6	
CnA---------- Clarendon	9W	Slight	Moderate	Slight	Loblolly pine--------	90	9	Loblolly pine, slash pine, American sycamore, yellow poplar, sweetgum.
					Slash pine----------	90	11	
					Sweetgum----------	85	6	
CoB, CtC2, CtD2---- Cowarts	9A	Slight	Slight	Slight	Loblolly pine--------	86	9	Loblolly pine, longleaf pine, slash pine.
					Slash pine----------	86	11	
					Longleaf pine--------	67	5	
DoA, DoB, DtC2----- Dothan	12A	Slight	Slight	Slight	Slash pine----------	92	12	Slash pine, loblolly pine, longleaf pine.
					Longleaf pine--------	84	8	
					Loblolly pine--------	88	9	
FaB, FaC2---------- Faceville	8A	Slight	Slight	Slight	Loblolly pine--------	82	8	Loblolly pine, slash pine.
					Slash pine----------	80	10	
					Longleaf pine--------	65	5	
FuB, FuC---------- Fuquay	8S	Slight	Moderate	Moderate	Loblolly pine--------	83	8	Longleaf pine.
					Longleaf pine--------	67	5	
Gr---------- Grady	4W	Slight	Severe	Severe	Blackgum----------	68	6	American sycamore, water tupelo.
					Baldcypress----------	65	6	
					Water oak----------	65	4	
GsA, GsB, GsC------ Greenville	8A	Slight	Slight	Slight	Loblolly pine--------	85	8	Loblolly pine, longleaf pine, slash pine.
					Longleaf pine--------	70	6	
					Slash pine----------	85	10	
HM**:								
Herod----------	9W	Slight	Severe	Severe	Loblolly pine--------	100	9	Loblolly pine, slash pine, sweetgum, eastern cottonwood.
					Sweetgum----------	95	8	
					Water oak----------	90	---	
					Eastern cottonwood---	100	---	
Muckalee----------	7W	Slight	Severe	Severe	Sweetgum----------	90	7	Sweetgum, loblolly pine, American sycamore, eastern cottonwood, Nuttall oak.
					Loblolly pine--------	90	9	
					Slash pine----------	90	11	
					Water oak----------	90	6	
					Green ash----------	85	4	
					Eastern cottonwood---	100	9	
LaB, LaD---------- Lakeland	9S	Slight	Moderate	Moderate	Slash pine----------	75	9	Slash pine, loblolly pine.
					Loblolly pine--------	75	7	
					Longleaf pine--------	60	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
LuB, LuC---------- Lucy	8S	Slight	Moderate	Moderate	Loblolly pine--------	86	8	Slash pine, longleaf pine, loblolly pine.
					Longleaf pine--------	74	6	
MaB---------- Marlboro	8A	Slight	Slight	Slight	Loblolly pine--------	82	8	Slash pine, loblolly pine.
					Slash pine----------	80	10	
					Longleaf pine--------	62	4	
Ms---------- Mascotte	10W	Slight	Moderate	Moderate	Slash pine----------	83	10	Slash pine, loblolly pine.
					Loblolly pine--------	80	8	
					Longleaf pine--------	70	6	
NaB, NkC2---------- Nankin	8A	Slight	Slight	Slight	Loblolly pine--------	80	8	Loblolly pine, slash pine.
					Slash pine----------	80	10	
					Longleaf pine--------	70	6	
Oc---------- Ochlockonee	11A	Slight	Slight	Slight	Loblolly pine--------	100	11	Loblolly pine, yellow poplar, eastern cottonwood.
					Eastern cottonwood---	100	9	
					Yellow poplar--------	110	9	
					Slash pine----------	100	13	
					Sweetgum------------	96	8	
					Water oak-----------	80	5	
Od---------- Ocilla	8W	Slight	Moderate	Moderate	Loblolly pine--------	85	8	Loblolly pine, slash pine.
					Slash pine----------	90	11	
					Longleaf pine--------	77	7	
OrA, OrB, OrE, OsC2, OsD2-------- Orangeburg	8A	Slight	Slight	Slight	Loblolly pine--------	80	8	Slash pine, loblolly pine.
					Slash pine----------	86	11	
					Longleaf pine--------	77	7	
Pe---------- Pelham	11W	Slight	Severe	Severe	Slash pine----------	90	11	Slash pine, loblolly pine.
					Loblolly pine--------	90	9	
					Longleaf pine--------	80	7	
					Sweetgum------------	80	6	
					Blackgum------------	80	8	
					Water oak-----------	80	5	
Ra---------- Rains	10W	Slight	Severe	Severe	Loblolly pine--------	94	10	Loblolly pine, slash pine, sweetgum, American sycamore.
					Slash pine----------	91	12	
					Sweetgum------------	90	7	
ReB---------- Red Bay	9A	Slight	Slight	Slight	Loblolly pine--------	90	9	Loblolly pine, slash pine, longleaf pine.
					Slash pine----------	90	11	
					Longleaf pine--------	77	7	
SuB, SuC---------- Susquehanna	8C	Slight	Moderate	Slight	Loblolly pine--------	78	8	Loblolly pine, shortleaf pine.
					Shortleaf pine-------	68	7	
TC**:								
Tawcaw----------	8W	Slight	Moderate	Moderate	Sweetgum------------	95	8	Sweetgum, water tupelo.
					Water oak-----------	---	---	
					Water tupelo---------	---	---	
Chastain----------	8W	Slight	Severe	Severe	Sweetgum------------	95	8	Sweetgum.
					Baldcypress----------	---	---	
					Water tupelo---------	---	---	
					Water oak-----------	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
TC**: Congaree	10A	Slight	Slight	Slight	Sweetgum	100	10	Loblolly pine, slash pine, yellow poplar, American sycamore, black walnut, cherrybark oak, eastern cottonwood, sweetgum.
					Yellow poplar	107	8	
					Cherrybark oak	107	12	
					Loblolly pine	89	9	
					Eastern cottonwood	107	10	
					American sycamore	73	---	
					Black walnut	100	---	
					Scarlet oak	100	5	
					Willow oak	95	6	
					Green ash	---	---	
					American beech	---	---	
TfA, TfB, TnC2 Tifton	9A	Slight	Slight	Slight	Loblolly pine	86	9	Loblolly pine, slash pine.
					Slash pine	86	11	
					Longleaf pine	72	6	
TrB Troup	8S	Slight	Slight	Moderate	Loblolly pine	78	8	Loblolly pine, longleaf pine.
					Longleaf pine	76	6	

* 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 9.--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
AeB Ailey	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Moderate: droughty.
AeC Ailey	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Moderate: droughty.
AmB Americus	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
AmC Americus	Slight	Slight	Severe: slope.	Slight	Moderate: droughty.
CaB2 Carnegie	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly, small stones.	Slight	Slight.
CaC2 Carnegie	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
CnA Clarendon	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
CoB Cowarts	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
CtC2 Cowarts	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
CtD2 Cowarts	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
DoA Dothan	Slight	Slight	Slight	Slight	Slight.
DoB Dothan	Slight	Slight	Moderate: slope.	Slight	Slight.
DtC2 Dothan	Slight	Slight	Severe: slope.	Slight	Slight.
FaB Faceville	Slight	Slight	Moderate: slope.	Slight	Slight.
FaC2 Faceville	Slight	Slight	Severe: slope.	Slight	Slight.
FuB Fuquay	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
FuC Fuquay	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty.
Gr Grady	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GsA---- Greenville	Slight	Slight	Slight	Slight	Slight.
GsB---- Greenville	Slight	Slight	Moderate: slope.	Slight	Slight.
GsC---- Greenville	Slight	Slight	Severe: slope.	Slight	Slight.
HM*:					
Herod----	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Muckalee----	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
LaB---- Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
LaD---- Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, slope, too sandy.
LuB---- Lucy	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
LuC---- Lucy	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty.
MaB---- Marlboro	Slight	Slight	Moderate: slope.	Slight	Slight.
Ms---- Mascotte	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness.
NaB---- Nankin	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
NkC2---- Nankin	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
Oc---- Ochlockonee	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
Od---- Ocilla	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, droughty.
OrA---- Orangeburg	Slight	Slight	Slight	Slight	Slight.
OrB---- Orangeburg	Slight	Slight	Moderate: slope.	Slight	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
OrE---------- Orangeburg	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
OsC2---------- Orangeburg	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
OsD2---------- Orangeburg	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
Pe---------- Pelham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
ReB---------- Red Bay	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
SuB---------- Susquehanna	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight----------	Slight.
SuC---------- Susquehanna	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight----------	Moderate: slope.
TC*: Tawcaw----------	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
Chastain----------	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Congaree----------	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
TfA---------- Tifton	Slight----------	Slight----------	Moderate: small stones.	Slight----------	Slight.
TfB---------- Tifton	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
TnC2---------- Tifton	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
TrB---------- Troup	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
Ud*. Udorthents					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--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
AeB---- Ailey	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
AeC---- Ailey	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
AmB, AmC---- Americus	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
CaB2---- Carnegie	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CaC2---- Carnegie	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CnA---- Clarendon	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CoB---- Cowarts	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CtC2, CtD2---- Cowarts	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DoA, DoB, DtC2---- Dothan	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FaB---- Faceville	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FaC2---- Faceville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FuB---- Fuquay	Fair	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
FuC---- Fuquay	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Gr---- Grady	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
GsA, GsB---- Greenville	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GsC---- Greenville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HM*:										
Herod----	Poor	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Muckalee----	Poor	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
LaB, LaD---- Lakeland	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.

See footnote at end of table.

TABLE 10.--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
LuB, LuC---------- Lucy	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
MaB---------- Marlboro	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ms---------- Mascotte	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.
NaB---------- Nankin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NkC2---------- Nankin	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Oc---------- Ochlockonee	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Od---------- Ocilla	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Good	Fair.
OrA, OrB---------- Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OrE, OsC2, OsD2---- Orangeburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Pe---------- Pelham	Poor	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
Ra---------- Rains	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
ReB---------- Red Bay	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SuB, SuC---------- Susquehanna	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TC*:										
Tawcaw----------	Very poor.	Poor	Poor	Good	Fair	Fair	Fair	Poor	Fair	Fair.
Chastain----------	Very poor.	Poor	Poor	Fair	Poor	Good	Good	Poor	Fair	Good.
Congaree----------	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
TfA---------- Tifton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
TfB---------- Tifton	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TnC2---------- Tifton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TrB---------- Troup	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--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
AeB---Ailey	Moderate: cutbanks cave, dense layer.	Slight	Slight	Slight	Slight	Moderate: droughty.
AeC---Ailey	Moderate: cutbanks cave, dense layer.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
AmB---Americus	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
AmC---Americus	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
CaB2---Carnegie	Moderate: too clayey, dense layer.	Slight	Slight	Slight	Moderate: low strength.	Slight.
CaC2---Carnegie	Moderate: too clayey, dense layer.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
CnA---Clarendon	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
CoB---Cowarts	Slight	Slight	Slight	Slight	Slight	Slight.
CtC2---Cowarts	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
CtD2---Cowarts	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
DoA, DoB---Dothan	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
DtC2---Dothan	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Slight.
FaB---Faceville	Moderate: too clayey.	Slight	Slight	Slight	Moderate: low strength.	Slight.
FaC2---Faceville	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
FuB---Fuquay	Moderate: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
FuC---Fuquay	Moderate: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Moderate: droughty.
Gr---Grady	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
GsA, GsB---Greenville	Moderate: too clayey.	Slight	Slight	Slight	Slight	Slight.

TABLE 11.--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
GsC---------- Greenville	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
HM*:						
Herod----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Muckalee----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
LaB---------- Lakeland	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
LaD---------- Lakeland	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
LuB---------- Lucy	Moderate: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
LuC---------- Lucy	Moderate: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
MaB---------- Marlboro	Moderate: too clayey.	Slight---------	Slight---------	Slight---------	Moderate: low strength.	Slight.
Ms---------- Mascotte	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
NaB---------- Nankin	Moderate: too clayey.	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
NkC2---------- Nankin	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
Oc---------- Ochlockonee	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Od---------- Ocilla	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
OrA, OrB---------- Orangeburg	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
OrE---------- Orangeburg	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
OsC2---------- Orangeburg	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
OsD2---------- Orangeburg	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.

See footnote at end of table.

TABLE 11.--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
Pe Pelham	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ra Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
ReB Red Bay	Slight	Slight	Slight	Slight	Slight	Slight.
SuB Susquehanna	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
SuC Susquehanna	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
TC*: Tawcaw	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
Chastain	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Congaree	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
TfA, TfB Tifton	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
TnC2 Tifton	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Slight.
TrB Troup	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
Ud*. Udorthents						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--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
AeB, AeC---------- Ailey	Severe: percs slowly.	Severe: seepage.	Slight----------	Severe: seepage.	Good.
AmB, AmC---------- Americus	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
CaB2, CaC2---------- Carnegie	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
CnA---------- Clarendon	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
CoB, CtC2---------- Cowarts	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
CtD2---------- Cowarts	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
DoA---------- Dothan	Moderate: wetness, percs slowly.	Moderate: seepage.	Slight----------	Slight----------	Good.
DoB, DtC2---------- Dothan	Moderate: wetness, percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
FaB, FaC2---------- Faceville	Slight----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
FuB, FuC---------- Fuquay	Moderate: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Fair: too sandy.
Gr---------- Grady	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
GsA---------- Greenville	Slight----------	Moderate: seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
GsB, GsC---------- Greenville	Slight----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
HM*:					
Herod----------	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Muckalee----------	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 12.--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
LaB Lakeland	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
LaD Lakeland	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
LuB, LuC Lucy	Slight	Moderate: seepage.	Slight	Slight	Fair: too clayey.
MaB Marlboro	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Ms Mascotte	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
NaB, NkC2 Nankin	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Oc Ochlockonee	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: wetness.
Od Ocilla	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
OrA Orangeburg	Slight	Moderate: seepage.	Slight	Slight	Good.
OrB Orangeburg	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
OrE Orangeburg	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
OsC2 Orangeburg	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
OsD2 Orangeburg	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Pe Pelham	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness, seepage.	Poor: wetness.
Ra Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
ReB Red Bay	Slight	Moderate: seepage, slope.	Slight	Slight	Good.

See footnote at end of table.

TABLE 12.--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
SuB---------- Susquehanna	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
SuC---------- Susquehanna	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
TC*:					
Tawcaw----------	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, hard to pack, wetness.
Chastain----------	Severe: flooding, wetness, percs slowly.	Severe: flooding, seepage.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness.	Poor: wetness, too clayey, hard to pack.
Congaree----------	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
TfA---------- Tifton	Moderate: percs slowly, wetness.	Moderate: seepage.	Slight----------	Slight----------	Fair: small stones.
TfB, TnC2---------- Tifton	Moderate: percs slowly, wetness.	Moderate: slope, seepage.	Slight----------	Slight----------	Fair: small stones.
TrB---------- Troup	Slight----------	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Ud*. Udorthents					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--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
AeB, AeC Ailey	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
AmB, AmC Americus	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
CaB2, CaC2 Carnegie	Moderate: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CnA Clarendon	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
CoB, CtC2 Cowarts	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
CtD2 Cowarts	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
DoA, DoB, DtC2 Dothan	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
FaB, FaC2 Faceville	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
FuB, FuC Fuquay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Gr Grady	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.
GsA, GsB, GsC Greenville	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HM*:				
Herod	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Muckalee	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
LaB, LaD Lakeland	Good	Probable	Improbable: too sandy.	Poor: too sandy.
LuB, LuC Lucy	Good	Improbable: excess fines, thin layer.	Improbable: excess fines.	Fair: too sandy.
MaB Marlboro	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Ms Mascotte	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
NaB, NkC2 Nankin	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Oc Ochlockonee	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Od Ocilla	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
OrA, OrB Orangeburg	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
OrE Orangeburg	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
OsC2 Orangeburg	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
OsD2 Orangeburg	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
Pe Pelham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ra Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
ReB Red Bay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
SuB, SuC Susquehanna	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
TC*:				
Tawcaw	Fair: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Chastain	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Congaree	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
TfA, TfB, TnC2 Tifton	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
TrB Troup	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Ud*. Udorthents				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--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	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AeB, AeC---------- Ailey	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Droughty, percs slowly, slope.	Too sandy, percs slowly.	Droughty, rooting depth.
AmB, AmC---------- Americus	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, slope, fast intake.	Too sandy------	Droughty.
CaB2, CaC2-------- Carnegie	Slight---------	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
CnA--------------- Clarendon	Moderate: seepage.	Moderate: piping, wetness.	Favorable------	Wetness--------	Wetness--------	Favorable.
CoB, CtC2--------- Cowarts	Slight---------	Moderate: piping.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly, rooting depth.
CtD2-------------- Cowarts	Slight---------	Moderate: piping.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly, rooting depth.
DoA--------------- Dothan	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Favorable------	Favorable.
DoB, DtC2--------- Dothan	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
FaB, FaC2--------- Faceville	Moderate: seepage.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
FuB--------------- Fuquay	Slight---------	Slight---------	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
FuC--------------- Fuquay	Slight---------	Slight---------	Deep to water	Droughty, fast intake, slope.	Too sandy------	Droughty.
Gr---------------- Grady	Slight---------	Severe: ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
GsA--------------- Greenville	Moderate: seepage.	Slight---------	Deep to water	Favorable------	Favorable------	Favorable.
GsB, GsC---------- Greenville	Moderate: seepage.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
HM*:						
Herod------------	Moderate: seepage.	Severe: wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
Muckalee---------	Moderate: seepage.	Severe: piping, wetness.	Flooding, cutbanks cave.	Wetness, droughty, flooding.	Wetness, too sandy.	Wetness, droughty.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
LaB---------- Lakeland	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
LaD---------- Lakeland	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, fast intake.	Slope, too sandy.	Slope, droughty.
LuB---------- Lucy	Moderate: seepage.	Moderate: piping.	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
LuC---------- Lucy	Moderate: seepage.	Moderate: piping.	Deep to water	Droughty, fast intake, slope.	Too sandy------	Droughty.
MaB---------- Marlboro	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
Ms---------- Mascotte	Severe: seepage.	Severe: seepage, piping, wetness.	Favorable------	Wetness, droughty, fast intake.	Wetness--------	Wetness, droughty.
NaB, NkC2--------- Nankin	Moderate: seepage.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
Oc---------- Ochlockonee	Severe: seepage.	Severe: piping.	Deep to water	Flooding-------	Favorable------	Favorable.
Od---------- Ocilla	Severe: seepage.	Severe: piping, wetness.	Favorable------	Wetness, droughty, fast intake.	Wetness--------	Droughty.
OrA---------- Orangeburg	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Favorable------	Favorable.
OrB---------- Orangeburg	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
OrE---------- Orangeburg	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Slope----------	Slope.
OsC2---------- Orangeburg	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
OsD2---------- Orangeburg	Severe: slope.	Moderate: piping.	Deep to water	Slope----------	Slope----------	Slope.
Pe---------- Pelham	Severe: seepage.	Severe: piping, wetness.	Favorable------	Fast intake, wetness.	Wetness--------	Wetness, droughty.
Ra---------- Rains	Moderate: seepage.	Severe: piping, wetness.	Favorable------	Wetness--------	Wetness--------	Wetness.
ReB---------- Red Bay	Moderate: seepage.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
SuB---------- Susquehanna	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
SuC---------- Susquehanna	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
TC*:						
Tawcaw----------	Slight---------	Severe: wetness.	Percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.	Percs slowly.
Chastain----------	Moderate: seepage.	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Congaree----------	Moderate: seepage.	Severe: piping.	Flooding-------	Wetness--------	Wetness--------	Favorable.
TfA---------- Tifton	Moderate: seepage.	Slight---------	Deep to water	Favorable------	Favorable------	Favorable.
TfB, TnC2---------- Tifton	Moderate: seepage.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
TrB---------- Troup	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, slope.	Too sandy------	Droughty.
Ud*. Udorthents						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--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		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
AeB, AeC--------- Ailey	0-28	Loamy sand--------	SM, SP-SM	A-2, A-3	85-100	75-100	50-80	5-20	---	NP
	28-39	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	90-100	75-100	60-90	30-40	20-40	3-16
	39-46	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	90-100	75-100	55-90	20-40	20-40	3-15
	46-65	Coarse sandy loam, sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	85-100	75-100	50-85	15-40	<40	NP-14
AmB, AmC--------- Americus	0-6	Loamy sand--------	SM, SP-SM	A-2	100	95-100	80-85	10-20	---	NP
	6-44	Loamy sand, loamy fine sand.	SM	A-2	100	95-100	85-90	13-20	---	NP
	44-75	Sandy loam, loamy sand, fine sandy loam.	SM, SM-SC	A-2	95-100	95-100	75-90	15-35	<28	NP-7
CaB2, CaC2------- Carnegie	0-5	Sandy loam--------	SM, SM-SC	A-2	85-100	75-95	51-75	13-30	<25	NP-5
	5-18	Sandy clay, sandy clay loam.	CL	A-6, A-7	95-100	90-99	90-95	65-70	36-49	13-25
	18-32	Sandy clay, clay	CL	A-6, A-7	92-100	90-98	89-98	63-76	36-49	13-25
	32-65	Sandy clay, clay	CL	A-7, A-6	99-100	98-100	90-98	68-79	36-49	13-25
CnA-------------- Clarendon	0-12	Loamy sand--------	SM, SP-SM	A-2	98-100	85-100	65-90	10-30	<20	NP-3
	12-30	Sandy clay loam, sandy loam.	SC, CL, SM-SC, CL-ML	A-4, A-6	98-100	85-100	55-95	30-55	20-40	5-15
	30-65	Sandy clay loam, sandy loam, sandy clay.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	99-100	96-100	80-95	25-55	<40	NP-15
CoB-------------- Cowarts	0-6	Loamy sand--------	SM	A-2	90-100	85-100	50-80	13-30	---	NP
	6-21	Fine sandy loam, sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2, A-4, A-6	95-100	90-100	60-95	23-45	20-40	NP-15
	21-27	Sandy clay loam, sandy clay, clay loam.	SM, SC	A-6, A-7, A-2-6, A-2-7	95-100	90-100	60-95	25-50	30-54	11-25
	27-65	Sandy loam, sandy clay loam, clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	85-100	80-100	60-95	25-58	25-53	5-20
CtC2, CtD2------- Cowarts	0-4	Sandy loam--------	SM, SM-SC	A-2, A-4	95-100	90-100	75-90	20-40	<20	NP-5
	4-21	Fine sandy loam, sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2, A-4, A-6	95-100	90-100	60-95	23-45	20-40	NP-15
	21-27	Sandy clay loam, sandy clay, clay loam.	SM, SC	A-6, A-7, A-2-6, A-2-7	95-100	90-100	60-95	25-50	30-54	11-25
	27-60	Sandy loam, sandy clay loam, clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	85-100	80-100	60-95	25-58	25-53	5-20
DoA, DoB--------- Dothan	0-6	Loamy sand--------	SM	A-2	95-100	92-100	60-80	13-30	---	NP
	6-30	Sandy clay loam, sandy loam, fine sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	95-100	92-100	68-90	23-49	<40	NP-16
	30-65	Sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	95-100	92-100	70-95	30-53	25-45	4-23

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
DtC2---------- Dothan	0-6	Sandy loam-------	SM, SP-SM	A-2, A-4	95-100	92-100	75-90	20-40	<25	NP-5
	6-30	Sandy clay loam, sandy loam, fine sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	95-100	92-100	68-90	23-49	<40	NP-16
	30-65	Sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6, A-7	95-100	92-100	70-95	30-53	25-45	4-23
FaB---------- Faceville	0-5	Sandy loam-------	SM, SM-SC	A-2, A-4	90-100	85-100	72-97	17-38	<25	NP-7
	5-11	Sandy clay loam, sandy clay.	SC, ML, CL, SM	A-4, A-6	98-100	90-100	85-98	46-66	<35	NP-13
	11-65	Sandy clay, clay, clay loam.	CL, SC, CH, ML	A-6, A-7	98-100	95-100	75-99	45-72	25-52	11-25
FaC2---------- Faceville	0-4	Sandy loam-------	SM, SM-SC	A-2, A-4	90-100	85-100	72-97	17-38	<25	NP-7
	4-11	Sandy clay loam, sandy clay.	SC, ML, CL, SM	A-4, A-6	98-100	90-100	85-98	46-66	<35	NP-13
	11-65	Sandy clay, clay, clay loam.	CL, SC, CH, ML	A-6, A-7	98-100	95-100	75-99	45-72	25-52	11-25
FuB, FuC---------- Fuquay	0-24	Loamy sand-------	SP-SM, SM	A-2, A-3	95-100	90-100	50-83	5-35	---	NP
	24-37	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	85-100	85-100	70-90	23-45	<25	NP-13
	37-65	Sandy clay loam	SC, SM-SC, CL-ML	A-2, A-4, A-6, A-7-6	95-100	90-100	58-90	28-49	20-49	4-12
Gr---------- Grady	0-5	Loam----------	ML, CL-ML, CL	A-4, A-6	100	99-100	85-100	50-75	<30	NP-15
	5-9	Clay loam, sandy clay loam, loam.	CL	A-6	100	100	90-100	51-80	25-40	11-20
	9-65	Clay, sandy clay	CL, CH, MH	A-6, A-7	100	100	90-100	55-90	30-51	12-24
GsA, GsB, GsC---- Greenville	0-6	Sandy loam-------	SM, SC, SM-SC, CL-ML	A-2, A-4	95-100	90-100	65-85	25-55	16-25	NP-10
	6-65	Clay loam, sandy clay, clay.	CL, SC, ML	A-6, A-7, A-4	98-100	95-100	80-95	40-80	28-50	7-25
HM*:										
Herod----------	0-9	Sandy loam-------	SM, SM-SC	A-2, A-4	100	95-100	50-90	30-49	<30	NP-7
	9-42	Clay loam, sandy clay loam, loam.	CL, SC	A-6, A-4	100	95-100	80-100	45-85	25-40	8-20
	42-65	Sandy loam, sandy clay loam.	CL, SM, ML, SC	A-4, A-6	100	95-100	70-90	36-60	<30	NP-15
Muckalee--------	0-5	Sandy loam-------	SM	A-2, A-4	95-100	90-100	55-90	25-40	<20	NP-4
	5-65	Sandy loam, loamy sand.	SM	A-2, A-4	95-100	80-100	60-90	20-40	<20	NP-4
LaB, LaD--------- Lakeland	0-63	Sand----------	SP-SM	A-3, A-2-4	90-100	90-100	60-100	5-12	---	NP
	63-85	Sand, fine sand	SP, SP-SM	A-3, A-2-4	90-100	90-100	50-100	1-12	---	NP
LuB, LuC--------- Lucy	0-24	Loamy sand-------	SM, SP-SM	A-2	98-100	95-100	50-90	10-40	---	NP
	24-30	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	97-100	95-100	55-95	15-50	16-30	NP-15
	30-65	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, SM	A-2, A-6, A-4	100	95-100	60-95	20-50	20-40	3-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
MaB--- Marlboro	0-6	Sandy loam---	SM, SM-SC, ML, CL-ML	A-2, A-4	98-100	95-100	75-100	30-60	<35	NP-7
	6-52	Sandy clay, clay loam, clay.	CL, ML, CL-ML	A-4, A-6, A-7	98-100	95-100	78-100	51-70	25-48	6-20
	52-65	Sandy clay loam, sandy clay, clay.	CL, ML, SM, SC	A-4, A-6, A-7	98-100	95-100	74-100	45-70	24-48	6-20
Ms--- Mascotte	0-11	Sand---	SP-SM	A-3, A-2-4	100	100	85-100	5-12	---	NP
	11-22	Fine sand, sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	100	100	85-100	8-15	---	NP
	22-30	Fine sand, sand, loamy fine sand.	SP-SM	A-3, A-2-4	100	100	85-100	5-12	---	NP
	30-65	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, SM	A-2, A-4, A-6	100	100	85-100	19-45	<38	NP-15
NaB--- Nankin	0-7	Loamy sand---	SM, SP-SM	A-2	85-100	85-100	50-85	10-35	---	NP
	7-15	Sandy clay loam, sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	97-100	95-100	75-90	25-45	20-35	4-15
	15-42	Sandy clay, clay, sandy clay loam.	SC, CL, ML, CL-ML	A-4, A-6, A-7	98-100	95-100	75-95	40-70	25-45	7-20
	42-65	Sandy clay loam, sandy loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	98-100	95-100	70-85	25-55	20-40	4-16
NkC2--- Nankin	0-5	Sandy loam---	SM, SM-SC	A-2, A-4	85-100	85-100	70-90	25-45	<25	NP-4
	5-9	Sandy clay loam, sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	97-100	95-100	75-90	25-45	20-35	4-15
	9-53	Sandy clay, clay, sandy clay loam.	SC, CL, ML, CL-ML	A-4, A-6, A-7	98-100	95-100	75-95	40-70	25-45	7-20
	53-70	Sandy clay loam, sandy loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	98-100	95-100	70-85	25-55	20-40	4-16
Oc--- Ochlockonee	0-8	Sandy loam---	SM, ML, SM-SC, CL-ML	A-4, A-2	100	95-100	65-90	40-70	<26	NP-5
	8-40	Fine sandy loam, sandy loam, silt loam.	SM, ML, SC, CL	A-4	100	95-100	95-100	36-75	<32	NP-9
	40-65	Loamy sand, sandy loam, silt loam.	SM, ML, CL, SC	A-4, A-2	100	95-100	85-99	13-80	<32	NP-9
Od--- Ocilla	0-24	Loamy sand---	SM, SP-SM	A-2, A-3	100	95-100	75-100	8-35	---	NP
	24-65	Sandy loam, sandy clay loam, fine sandy loam.	SM, CL, SC, ML	A-2, A-4, A-6	100	95-100	80-100	20-55	20-40	NP-18
OrA, OrB, OrE--- Orangeburg	0-6	Loamy sand---	SM	A-2	98-100	95-100	60-87	14-28	---	NP
	6-10	Sandy loam---	SM	A-2	98-100	95-100	70-96	25-35	<30	NP-4
	10-48	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	98-100	95-100	71-96	38-58	22-40	3-19
	48-65	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	98-100	95-100	70-97	40-65	24-46	8-21

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
OsC2, OsD2------- Orangeburg	0-5	Sandy loam--------	SM	A-2	98-100	95-100	75-95	20-35	---	NP
	5-10	Sandy loam--------	SM	A-2	98-100	95-100	70-96	25-35	<30	NP-4
	10-48	Sandy clay loam, sandy loam.	SC, CL, SM, SM-SC	A-6, A-4	98-100	95-100	71-96	38-58	22-40	3-19
	48-65	Sandy clay loam, sandy clay, sandy loam.	SC, CL	A-6, A-4, A-7	98-100	95-100	70-97	40-65	24-46	8-21
Pe--------------- Pelham	0-27	Loamy sand--------	SM	A-2	100	95-100	75-100	15-30	---	NP
	27-48	Sandy clay loam, sandy loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	100	95-100	65-100	27-50	16-30	2-12
	48-65	Sandy clay loam, sandy loam, sandy clay.	SC, SM, ML, CL	A-2, A-4, A-6, A-7	100	95-100	65-100	27-65	20-45	3-20
Ra--------------- Rains	0-15	Sandy loam--------	SM, ML	A-2, A-4	100	95-100	50-85	25-56	<35	NP-10
	15-40	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	100	95-100	55-98	30-70	18-40	4-20
	40-65	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	100	98-100	60-98	36-72	18-45	4-28
ReB-------------- Red Bay	0-6	Loamy sand--------	SM	A-2	100	90-100	51-75	15-30	---	NP
	6-12	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4	100	95-100	60-85	15-50	<35	NP-10
	12-48	Sandy clay loam	SM-SC, SC	A-2, A-4, A-6	100	95-100	70-90	24-50	18-40	4-16
	48-75	Sandy clay loam, sandy clay.	SC, CL	A-6, A-4, A-7	100	98-100	70-97	40-65	24-46	8-21
SuB, SuC--------- Susquehanna	0-3	Sandy loam--------	SM	A-6	95-100	95-100	65-90	40-55	<40	NP-10
	3-32	Clay--------------	CL	A-7	100	95-100	75-87	51-79	40-49	15-27
	32-65	Clay--------------	MH	A-7	100	95-100	88-100	80-98	50-90	28-56
TC*:										
Tawcaw-----------	0-7	Silty clay loam	CL, CH	A-6, A-7, A-4	100	100	85-100	75-95	28-55	8-26
	7-65	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	100	100	90-100	51-98	30-65	11-33
Chastain---------	0-5	Silty clay--------	ML, CL, MH, CH	A-6, A-7	100	100	90-100	75-98	35-75	12-40
	5-49	Silty clay loam, silty clay.	CL, CH, ML, MH	A-6, A-7	100	100	95-100	70-98	35-75	12-40
	49-72	Clay loam, sand, sandy loam, clay.	SM, SP-SM, CL	A-2, A-3, A-7	100	100	51-95	4-90	<40	NP-20
Congaree---------	0-6	Loam--------------	CL-ML, ML, CL	A-4	95-100	95-100	70-100	51-90	20-35	3-10
	6-48	Silty clay loam, fine sandy loam, loam.	SC, ML, CL, SM	A-4, A-6, A-7	95-100	95-100	70-100	40-90	25-50	3-22
	48-65	Variable---------	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
TfA, TfB--------- Tifton	0-6	Loamy sand-------	SM, SP-SM	A-2	70-97	62-94	53-85	11-27	---	NP
	6-9	Sandy loam, gravelly sandy loam, fine sandy loam.	SM, SM-SC	A-2	70-95	56-89	55-89	20-35	<25	NP-7
	9-36	Sandy clay loam, gravelly sandy clay loam.	SC, CL	A-2, A-6, A-4	70-98	65-94	60-89	22-53	22-40	8-22
	36-65	Sandy clay loam, sandy clay.	SC, CL	A-2, A-6, A-7, A-4	87-100	80-99	50-94	34-55	24-45	8-23
TnC2------------- Tifton	0-6	Sandy loam-------	SM, SM-SC	A-2	70-95	60-89	55-89	15-30	<20	NP-6
	6-12	Sandy loam, gravelly sandy loam, fine sandy loam.	SM, SM-SC	A-2	70-95	56-89	55-89	20-35	<25	NP-7
	12-43	Sandy clay loam, gravelly sandy clay loam.	SC, CL	A-2, A-6, A-4	70-98	65-94	60-89	22-53	22-40	8-22
	43-65	Sandy clay loam, sandy clay.	SC, CL	A-2, A-6, A-7, A-4	87-100	80-99	50-94	34-55	24-45	8-23
TrB-------------- Troup	0-72	Sand-------------	SM, SP-SM	A-2	95-100	90-100	50-75	10-30	---	NP
	72-98	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2, A-6	95-100	90-100	60-90	24-55	19-40	4-20
Ud*. Udorthents										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--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 "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	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
AeB, AeC---------	0-28	5-10	1.35-1.45	6.0-20	0.03-0.05	4.5-5.5	Low----------	0.15	4	<1
Ailey	28-39	15-35	1.55-1.70	0.6-2.0	0.09-0.12	4.5-5.5	Low----------	0.24		
	39-46	18-32	1.70-1.80	0.06-0.2	0.06-0.10	4.5-5.5	Low----------	0.17		
	46-65	15-30	1.80-1.95	0.06-0.2	0.04-0.08	4.5-5.5	Low----------	0.15		
AmB, AmC---------	0-6	5-10	1.40-1.60	6.0-20	0.05-0.08	4.5-5.5	Very low-----	0.10	5	.5-1
Americus	6-44	8-14	1.40-1.60	6.0-20	0.09-0.12	4.5-5.5	Very low-----	0.17		
	44-75	10-20	1.45-1.60	2.0-6.0	0.09-0.12	4.5-5.5	Very low-----	0.20		
CaB2, CaC2-------	0-5	3-8	1.45-1.65	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.28	3	1-2
Carnegie	5-18	36-43	1.40-1.65	0.2-0.6	0.10-0.16	4.0-5.5	Low----------	0.32		
	18-32	36-51	1.40-1.65	0.2-0.6	0.10-0.14	4.0-5.5	Low----------	0.28		
	32-65	36-55	1.40-1.65	0.2-0.6	0.10-0.14	4.0-5.5	Low----------	0.28		
CnA---------------	0-12	2-10	1.40-1.60	2.0-6.0	0.08-0.12	4.5-5.5	Low----------	0.15	5	.5-3
Clarendon	12-30	10-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20		
	30-65	15-40	1.40-1.70	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.15		
CoB---------------	0-6	3-10	1.30-1.70	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.15	4	<1
Cowarts	6-21	10-30	1.30-1.50	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.28		
	21-27	25-40	1.30-1.50	0.2-2.0	0.10-0.16	4.5-5.5	Low----------	0.28		
	27-65	18-35	1.45-1.75	0.06-0.6	0.10-0.14	4.5-5.5	Low----------	0.24		
CtC2, CtD2-------	0-4	5-20	1.30-1.65	2.0-6.0	0.08-0.13	4.5-5.5	Low----------	0.24	4	<1
Cowarts	4-21	10-30	1.30-1.50	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.28		
	21-27	25-40	1.30-1.50	0.2-2.0	0.10-0.16	4.5-5.5	Low----------	0.28		
	27-60	18-35	1.45-1.75	0.06-0.6	0.10-0.14	4.5-5.5	Low----------	0.24		
DoA, DoB---------	0-6	5-15	1.30-1.60	2.0-6.0	0.06-0.10	4.5-5.5	Very low-----	0.15	5	<.5
Dothan	6-30	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28		
	30-65	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.28		
DtC2--------------	0-6	10-18	1.30-1.70	2.0-6.0	0.08-0.13	4.5-5.5	Very low-----	0.24	5	.5-1
Dothan	6-30	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28		
	30-65	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.28		
FaB---------------	0-5	5-20	1.40-1.65	6.0-20	0.06-0.09	4.5-5.5	Low----------	0.28	5	.5-2
Faceville	5-11	20-36	1.35-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Low----------	0.37		
	11-65	35-55	1.25-1.60	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.37		
FaC2--------------	0-4	5-20	1.40-1.65	6.0-20	0.06-0.09	4.5-5.5	Low----------	0.28	5	.5-2
Faceville	4-11	20-36	1.35-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Low----------	0.37		
	11-65	35-55	1.25-1.60	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.37		
FuB, FuC---------	0-24	2-10	1.60-1.70	>6.0	0.04-0.09	4.5-5.5	Low----------	0.15	5	.5-2
Fuquay	24-37	10-35	1.40-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Low----------	0.20		
	37-65	20-35	1.40-1.60	0.06-0.2	0.10-0.13	4.5-5.5	Low----------	0.20		
Gr----------------	0-5	20-30	1.20-1.45	0.6-2.0	0.10-0.18	4.5-5.5	Low----------	0.24	5	1-4
Grady	5-9	20-35	1.40-1.55	0.2-0.6	0.10-0.15	4.5-5.5	Low----------	0.10		
	9-65	45-65	1.50-1.60	0.06-0.2	0.12-0.16	4.5-5.5	Moderate-----	0.10		
GsA, GsB, GsC-----	0-6	5-20	1.30-1.65	0.6-6.0	0.07-0.14	4.5-5.5	Low----------	0.24	5	.5-1
Greenville	6-65	35-55	1.35-1.55	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.17		

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
HM*:										
Herod	0-9	10-20	1.30-1.55	0.6-2.0	0.10-0.16	5.1-5.5	Low	0.24	5	2-3
	9-42	20-35	1.30-1.50	0.6-2.0	0.14-0.20	5.6-6.5	Low	0.20		
	42-65	10-30	1.30-1.50	0.6-2.0	0.12-0.16	5.6-6.5	Low	0.20		
Muckalee	0-5	5-20	1.35-1.45	0.6-2.0	0.08-0.12	5.1-5.5	Low	0.20	5	1-2
	5-65	5-20	1.35-1.50	0.6-2.0	0.08-0.12	5.6-6.5	Low	0.20		
LaB, LaD	0-63	2-8	1.35-1.65	6.0-20	0.05-0.09	4.5-5.5	Low	0.10	5	<1
Lakeland	63-85	1-6	1.50-1.60	6.0-20	0.02-0.08	4.5-5.5	Low	0.10		
LuB, LuC	0-24	1-12	1.30-1.70	6.0-20	0.08-0.12	5.1-6.0	Low	0.10	5	.5-1
Lucy	24-30	10-30	1.40-1.60	2.0-6.0	0.10-0.12	4.5-5.5	Low	0.24		
	30-65	15-45	1.40-1.60	0.6-2.0	0.12-0.14	4.5-5.5	Low	0.28		
MaB	0-6	5-20	1.30-1.60	2.0-6.0	0.09-0.14	5.1-6.0	Low	0.20	5	.5-2
Marlboro	6-52	35-65	1.20-1.50	0.6-2.0	0.14-0.18	4.5-5.5	Low	0.20		
	52-65	30-60	1.20-1.50	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.20		
Ms	0-11	1-8	1.20-1.45	6.0-20	0.03-0.08	4.5-5.5	Low	0.10	5	2-6
Mascotte	11-22	2-12	1.35-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.15		
	22-30	2-8	1.35-1.50	6.0-20	0.03-0.08	4.5-5.5	Low	0.15		
	30-65	14-35	1.45-1.65	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24		
NaB	0-7	5-12	1.45-1.65	2.0-6.0	0.05-0.10	4.5-5.5	Low	0.17	3	.5-1
Nankin	7-15	15-35	1.55-1.65	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24		
	15-42	35-50	1.30-1.70	0.2-0.6	0.11-0.16	4.5-5.5	Low	0.24		
	42-65	15-35	1.60-1.70	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24		
NkC2	0-5	7-20	1.45-1.55	2.0-6.0	0.08-0.12	4.5-5.5	Low	0.28	3	.5-1
Nankin	5-9	15-35	1.55-1.65	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24		
	9-53	35-50	1.30-1.70	0.2-0.6	0.11-0.16	4.5-5.5	Low	0.24		
	53-70	15-35	1.60-1.70	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24		
Oc	0-8	3-18	1.40-1.60	2.0-6.0	0.07-0.14	4.5-5.5	Low	0.20	5	.5-2
Ochlockonee	8-40	8-18	1.40-1.60	0.6-2.0	0.10-0.20	4.5-5.5	Low	0.20		
	40-65	3-18	1.40-1.70	2.0-6.0	0.06-0.12	4.5-5.5	Low	0.17		
Od	0-24	4-10	1.45-1.65	2.0-20	0.05-0.08	4.5-5.5	Low	0.10	5	1-2
Ocilla	24-65	15-35	1.55-1.70	0.6-2.0	0.09-0.12	4.5-5.5	Low	0.24		
OrA, OrB, OrE	0-6	4-10	1.35-1.55	2.0-6.0	0.06-0.09	4.5-5.5	Low	0.10	5	.5-1
Orangeburg	6-10	7-18	1.50-1.65	2.0-6.0	0.09-0.12	4.5-5.5	Low	0.20		
	10-48	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low	0.24		
	48-65	20-45	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low	0.24		
OsC2, OsD2	0-5	7-15	1.30-1.50	2.0-6.0	0.07-0.10	4.5-5.5	Low	0.20	5	.5-2
Orangeburg	5-10	7-18	1.50-1.65	2.0-6.0	0.09-0.12	4.5-6.0	Low	0.20		
	10-48	18-35	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low	0.24		
	48-65	20-45	1.60-1.75	0.6-2.0	0.11-0.14	4.5-5.5	Low	0.24		
Pe	0-27	5-10	1.50-1.70	6.0-20	0.05-0.08	4.5-5.5	Low	0.10	5	1-2
Pelham	27-48	15-30	1.30-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.24		
	48-65	15-40	1.30-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low	0.24		
Ra	0-15	5-20	1.30-1.60	2.0-6.0	0.10-0.14	3.6-6.5	Low	0.20	5	1-4
Rains	15-40	18-35	1.30-1.60	0.6-2.0	0.11-0.15	3.6-5.5	Low	0.24		
	40-65	18-40	1.30-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.28		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
ReB	0-6	4-12	1.45-1.60	6.0-20	0.06-0.11	4.5-5.5	Low	0.15	5	<2
Red Bay	6-12	10-25	1.30-1.60	0.6-6.0	0.10-0.14	4.5-5.5	Low	0.15		
	12-48	18-35	1.30-1.50	0.6-2.0	0.12-0.17	4.5-5.5	Low	0.17		
	48-75	20-45	1.40-1.60	0.6-2.0	0.11-0.14	4.5-5.5	Low	0.24		
SuB, SuC	0-3	8-20	1.50-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.28	5	.5-2
Susquehanna	3-32	35-60	1.25-1.50	<0.06	0.15-0.20	4.5-5.5	High	0.32		
	32-65	35-76	1.25-1.50	<0.06	0.15-0.20	4.5-5.5	High	0.32		
TC*:										
Tawcaw	0-7	30-40	1.20-1.40	0.06-0.6	0.12-0.18	4.5-6.5	Moderate	0.28	5	2-4
	7-65	35-70	1.30-1.60	0.06-0.2	0.12-0.16	4.5-6.5	Moderate	0.37		
Chastain	0-5	27-50	1.20-1.40	0.06-0.2	0.12-0.16	4.5-6.0	Moderate	0.28	5	2-6
	5-49	35-60	1.30-1.50	0.06-0.2	0.12-0.16	4.5-6.0	Moderate	0.37		
	49-72	2-10	1.40-1.70	0.6-20	0.03-0.12	4.5-6.0	Low	0.10		
Congaree	0-6	10-25	1.20-1.40	0.6-2.0	0.12-0.20	5.1-6.0	Low	0.37	5	<4
	6-48	18-35	1.20-1.50	0.6-2.0	0.12-0.20	5.1-6.0	Low	0.37		
	48-65	---	---	---	---	---	---	---		
TfA, TfB	0-6	3-8	1.30-1.55	6.0-20	0.03-0.08	4.5-6.0	Low	0.10	4	<1
Tifton	6-9	13-22	1.45-1.65	6.0-20	0.08-0.12	4.5-6.0	Low	0.24		
	9-36	20-35	1.50-1.70	0.6-2.0	0.12-0.16	6.0	Low	0.24		
	36-65	25-40	1.55-1.80	0.2-0.6	0.10-0.13	4.5-5.5	Low	0.17		
TnC2	0-6	10-20	1.30-1.50	6.0-20	0.06-0.10	4.5-6.0	Low	0.17	4	1-2
Tifton	6-12	13-22	1.45-1.65	6.0-20	0.08-0.12	4.5-6.0	Low	0.24		
	12-43	20-35	1.50-1.70	0.6-2.0	0.12-0.16	6.0	Low	0.24		
	43-65	25-40	1.55-1.80	0.2-0.6	0.10-0.13	4.5-5.5	Low	0.17		
TrB	0-72	1-10	1.30-1.70	6.0-20	0.05-0.10	4.5-5.5	Very low	0.10	5	<1
Troup	72-98	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.20		
Ud*.										
Udorthents										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "frequent," "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			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
AeB, AeC---------- Ailey	B	None---------	---	---	>6.0	---	---	Moderate	Moderate.
AmB, AmC---------- Americus	A	None---------	---	---	>6.0	---	---	Low------	High.
CaB2, CaC2-------- Carnegie	C	None---------	---	---	>6.0	---	---	Low------	Moderate.
CnA--------------- Clarendon	C	None---------	---	---	2.0-3.0	Apparent	Dec-Mar	Moderate	High.
CoB, CtC2, CtD2--- Cowarts	C	None---------	---	---	>6.0	---	---	Moderate	Moderate.
DoA, DoB, DtC2---- Dothan	B	None---------	---	---	3.0-5.0	Perched	Jan-Apr	Moderate	Moderate.
FaB, FaC2--------- Faceville	B	None---------	---	---	>6.0	---	---	Low------	Moderate.
FuB, FuC---------- Fuquay	B	None---------	---	---	4.0-6.0	Perched	Jan-Mar	Low------	High.
Gr---------------- Grady	D	None---------	---	---	+2-1.0	Apparent	Dec-Jun	High-----	High.
GsA, GsB, GsC----- Greenville	B	None---------	---	---	>6.0	---	---	Moderate	High.
HM*:									
Herod------------	D	Frequent----	Brief-----	Nov-Apr	0.5-1.5	Apparent	Dec-Mar	High-----	Moderate.
Muckalee---------	D	Frequent----	Brief-----	Nov-Apr	0.5-1.5	Apparent	Dec-Mar	High-----	Moderate.
LaB, LaD---------- Lakeland	A	None---------	---	---	>6.0	---	---	Low------	Moderate.
LuB, LuC---------- Lucy	A	None---------	---	---	>6.0	---	---	Low------	High.
MaB--------------- Marlboro	B	None---------	---	---	>6.0	---	---	High-----	High.
Ms---------------- Mascotte	B/D	None---------	---	---	0-1.0	Apparent	Jun-Sep	High-----	High.
NaB, NkC2--------- Nankin	C	None---------	---	---	>6.0	---	---	High-----	High.
Oc---------------- Ochlockonee	B	Occasional	Very brief	Dec-Apr	3.0-5.0	Apparent	Dec-Apr	Low------	High.
Od---------------- Ocilla	C	None---------	---	---	1.0-2.5	Apparent	Dec-Apr	High-----	Moderate.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
OrA, OrB, OrE, OsC2, OsD2----- Orangeburg	B	None----------	---	---	>6.0	---	---	Moderate	Moderate.
Pe----------- Pelham	B/D	None----------	---	---	0-1.0	Apparent	Jan-Apr	High-----	High.
Ra----------- Rains	B/D	None----------	---	---	0-1.0	Apparent	Nov-Apr	High-----	High.
ReB---------- Red Bay	B	None----------	---	---	>6.0	---	---	Moderate	Moderate.
SuB, SuC----- Susquehanna	D	None----------	---	---	>6.0	---	---	High-----	High.
TC*:									
Tawcaw-------	C	Frequent-----	Long------	Dec-Apr	1.5-2.5	Apparent	Nov-Apr	High-----	High.
Chastain-----	D	Frequent-----	Very long	Dec-Apr	0-1.0	Apparent	Nov-May	High-----	High.
Congaree-----	B	Frequent-----	Brief-----	Nov-Apr	2.5-4.0	Apparent	Nov-Apr	Moderate	Moderate.
TfA, TfB, TnC2---- Tifton	B	None----------	---	---	3.5-6.0	Perched	Jan-Feb	Low------	Moderate.
TrB---------- Troup	A	None----------	---	---	>6.0	---	---	Low------	Moderate.
Ud*. Udorthents									

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--CHEMICAL TEST DATA

(Tests performed on material less than 2 millimeters in size. TR means trace. Dashes indicate that the test was not performed)

Soil name, report number, horizon, and depth in inches	Organic carbon	Total nitrogen	Dithionate citrate extractable	Ammonium acetate extractable bases					Extractable acidity	Extractable aluminum	Cation-exchange capacity			Aluminum saturation	Base saturation		pH	
											Sum of cations	Ammonium acetate	Bases and aluminum		Sum of cations	Ammonium acetate	$CaCl_2$ (1:2)	H_2O (1:1)
			Fe	Al	Ca	Mg	Na	K	Sum bases									
	Pct	Pct	Pct	Pct	Milliequivalents per 100 grams of soil									Pct	Pct	Pct		
Chastain:* (S81GA-175-2)																		
A------ 0 to 9	1.34	0.132	3.6	0.4	4.1	1.4	0.2	0.1	5.8	15.6	1.6	21.4	15.2	7.4	22	27	38	4.5	5.0
Bg1---- 9 to 14	1.12	0.109	1.7	0.2	6.1	2.1	0.4	0.1	8.7	15.3	2.1	24.0	18.6	10.8	19	36	47	4.3	5.1
Bg2---- 14 to 39	0.53	0.049	1.9	0.2	11.2	3.2	1.3	0.2	15.9	9.8	0.7	25.7	19.7	16.6	4	62	81	4.9	5.3
Bg3---- 39 to 60	0.20	---	2.6	0.2	---	3.9	2.9	0.2	---	---	---	---	21.8	---	---	---	---	7.3	7.4
Tawcaw:** (S81GA-175-3)																		
A1----- 0 to 6	2.01	0.191	3.3	0.3	6.7	1.8	0.1	0.2	8.8	15.4	0.5	24.2	16.7	9.3	5	36	53	4.7	4.8
A2----- 6 to 11	1.16	0.104	3.8	0.4	5.2	1.7	0.1	0.1	7.1	13.0	0.5	20.1	13.7	7.6	7	35	52	4.8	5.2
Bw1---- 11 to 24	0.85	0.080	3.3	0.3	4.2	1.5	0.1	0.2	6.0	10.5	0.4	16.5	11.3	6.4	6	36	53	4.9	5.3
Bw2---- 24 to 37	0.80	---	3.7	0.3	4.4	1.8	0.1	0.1	6.4	11.4	0.3	17.8	12.4	6.7	4	36	52	5.0	5.4
Bw3---- 37 to 65	0.71	---	1.7	0.2	5.5	2.9	0.2	0.2	8.8	9.9	0.7	18.7	14.1	9.5	7	47	62	4.8	5.4
C------ 65 to 83	0.06	---	0.8	TR	0.9	0.2	TR	TR	1.1	1.3	---	2.4	1.1	---	---	46	100	5.7	6.5

* This pedon is about 2.0 miles southeast on Georgia Highway 199 from the crossing of Pughes Creek; 2.3 miles generally southwest on woods road; 0.2 mile southeast on side road; near the Oconee River, in Laurens County. This soil is a taxadjunct to the series because pH is more than 6.0 below a depth of 39 inches.

** This pedon is 2.0 miles southeast on Georgia Highway 199 from the crossing of Pughes Creek; 2.0 miles generally southwest on woods road; 1,100 feet southeast of woods road; on a flood plain along the Oconee River, in Laurens County.

TABLE 19.--PHYSICAL TEST DATA

(Dashes indicate that the test was not performed)

Soil name, report number, horizon, and depth in inches	Ratio to total clay		Bulk density		COLE* (whole soil)	Water content**		Water retention difference (whole soil)
	Cation-exchange capacity	15 bar water	1/3 bar	Oven-dry		1/3 bar	15 bar	
			g/cm^3		Cm/cm	Pct (wt)		Cm/cm
Chastain:***								
(S81GA-175-2)								
A---------- 0 to 9	0.31	0.46	---	---	---	---	22.8	---
Bg1---------- 9 to 14	0.40	0.47	---	---	---	---	21.7	---
Bg2---------- 14 to 39	0.38	0.45	---	---	---	---	23.2	---
Bg3---------- 39 to 60	0.42	0.49	---	---	---	---	25.2	---
Tawcaw:****								
(S81GA-175-3)								
A1---------- 0 to 6	0.44	0.56	1.23	1.41	0.047	37.2	21.5	0.19
A2---------- 6 to 11	0.32	0.53	1.24	1.40	0.041	36.0	22.8	0.16
Bw1---------- 11 to 24	0.32	0.54	1.30	1.44	0.035	32.6	19.1	0.18
Bw2---------- 24 to 37	0.32	0.55	1.30	---	---	---	21.2	---
Bw3---------- 37 to 65	0.37	0.49	1.30	1.59	0.024	25.7	18.8	0.10
C---------- 65 to 83	0.34	0.59	1.60	---	---	---	1.9	---

* COLE means coefficient of linear extensibility. It is a quantitative method of determining the shrink-swell behavior of soil. It is an estimate of the vertical component of swelling of a natural solid clod. COLE is expressed as low (less than 0.03), moderate (0.03-0.06), and high (more than 0.06).

** Based on soil material less than 2 millimeters in size.

*** This pedon is about 2.0 miles southeast on Georgia Highway 199 from the crossing of Pughes Creek; 2.3 miles generally southwest on woods road; 0.2 mile southeast on side road; on a flood plain along the Oconee River, in Laurens County. This soil is a taxadjunct to the series because pH is more than 6.0 below a depth of 39 inches.

**** This pedon is 2.0 miles southeast on Georgia Highway 199 from the crossing of Pughes Creek; 2.0 miles generally southwest on woods road; 1,000 feet southeast of woods road; on a flood plain along the Oconee River, in Laurens County.

TABLE 20.--PARTICLE-SIZE ANALYSIS

(Tests performed on material less than 2 millimeters in size. TR means trace)

Soil name, report number, horizon, and depth in inches	Particle-size distribution											Percent of whole soil (more than 2 mm in size)
	Total			Silt		Sand						
	Clay (<.002 mm)	Silt (.002-.05 mm)	Sand (.05-2.0 mm)	Fine (.002-.02 mm)	Coarse (.02-.05 mm)	Very fine (.05-.10 mm)	Fine (.10-.25 mm)	Medium (.25-.50 mm)	Coarse (.50-1.0 mm)	Very coarse (1.0-2.0 mm)	
	Pct											
Chastain:* (S81GA-175-2)												
A---------- 0 to 9	49.5	43.0	7.5	31.7	11.3	3.5	3.2	0.7	0.1	TR	0.0
Bg1--------- 9 to 14	46.9	48.0	5.1	37.1	11.8	1.9	2.3	0.7	0.1	0.1	0.0
Bg2--------- 14 to 39	51.9	44.7	3.4	34.7	10.0	1.8	0.7	0.5	0.3	0.1	0.0
Bg3--------- 39 to 60	51.7	35.8	12.5	30.5	5.3	3.1	4.7	2.5	1.3	0.9	TR
Tawcaw:** (S81GA-175-3)												
A1---------- 0 to 6	38.3	53.5	8.2	40.4	13.1	4.7	2.6	0.6	0.2	0.1	0.0
A2---------- 6 to 11	43.2	50.4	6.4	39.9	10.5	3.8	2.1	0.4	0.1	TR	0.0
Bw1--------- 11 to 24	35.4	48.1	16.5	33.7	14.4	10.3	3.1	1.7	1.1	0.3	0.0
Bw2--------- 24 to 37	38.4	50.2	11.4	36.3	13.9	5.1	4.0	1.7	0.5	0.1	0.0
Bw3--------- 37 to 65	38.3	52.8	8.9	35.8	17.0	4.6	2.0	1.5	0.7	0.1	TR
C---------- 65 to 83	3.2	2.9	93.9	---	2.9	1.7	8.7	33.6	38.1	11.8	TR

* This pedon is about 2.0 miles southeast on Georgia Highway 199 from the crossing of Pughes Creek; 2.3 miles generally southwest on woods road; 0.2 mile southeast on side road; near the Oconee River, in Laurens County. This soil is a taxadjunct to the series because pH is more than 6.0 below a depth of 39 inches.

** This pedon is 2.0 miles southeast on Georgia Highway 199 from the crossing of Pughes Creek; 2.0 miles generally southwest on woods road; 1,000 feet southeast of woods road; on a flood plain along the Oconee River, in Laurens County.

TABLE 21.--ENGINEERING INDEX TEST DATA

(NP means nonplastic)

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution										Liquid limit	Plasticity index
			Percentage passing sieve--							Percentage smaller than--				
	AASHTO	Unified	2 inches	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm		
													Pct	
Nankin loamy sand:* (S83GA-167-1)														
Ap----- 0 to 7	A-2-4(0)	SM	---	---	100	98	96	69	20	12	5	4	---	NP
Bt1---- 15 to 30	A-6(5)	ML	---	---	---	100	98	82	59	53	46	44	38	12
C------ 42 to 65	A-6(5)	CL	---	---	---	100	99	80	54	41	37	34	37	13

* This pedon is 8.0 miles southeast on Georgia Highway 15 from the center of Wrightsville; 0.3 mile south on county road; 130 feet east of road; in Johnson County.

TABLE 22.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Ailey	Loamy, siliceous, thermic Arenic Hapludults
Americus	Sandy, siliceous, thermic Rhodic Paleudults
Carnegie	Clayey, kaolinitic, thermic Plinthic Paleudults
*Chastain	Fine, mixed, acid, thermic Typic Fluvaquents
Clarendon	Fine-loamy, siliceous, thermic Plinthaquic Paleudults
*Congaree	Fine-loamy, mixed, nonacid, thermic Typic Udifluvents
Cowarts	Fine-loamy, siliceous, thermic Typic Hapludults
Dothan	Fine-loamy, siliceous, thermic Plinthic Paleudults
Faceville	Clayey, kaolinitic, thermic Typic Paleudults
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Kandiudults
Grady	Clayey, kaolinitic, thermic Typic Paleaquults
Greenville	Clayey, kaolinitic, thermic Rhodic Paleudults
Herod	Fine-loamy, siliceous, nonacid, thermic Typic Fluvaquents
Lakeland	Thermic, coated Typic Quartzipsamments
Lucy	Loamy, siliceous, thermic Arenic Paleudults
Marlboro	Clayey, kaolinitic, thermic Typic Paleudults
Mascotte	Sandy, siliceous, thermic Ultic Haplaquods
Muckalee	Coarse-loamy, siliceous, nonacid, thermic Typic Fluvaquents
Nankin	Clayey, kaolinitic, thermic Typic Hapludults
Ochlockonee	Coarse-loamy, siliceous, acid, thermic Typic Udifluvents
Ocilla	Loamy, siliceous, thermic Aquic Arenic Paleudults
Orangeburg	Fine-loamy, siliceous, thermic Typic Paleudults
Pelham	Loamy, siliceous, thermic Arenic Paleaquults
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Red Bay	Fine-loamy, siliceous, thermic Rhodic Paleudults
*Susquehanna	Fine, montmorillonitic, thermic Vertic Paleudalfs
Tawcaw	Fine, kaolinitic, thermic Fluvaquentic Dystrochrepts
Tifton	Fine-loamy, siliceous, thermic Plinthic Paleudults
Troup	Loamy, siliceous, thermic Grossarenic Paleudults

* U.S. Government Printing Office: 1991-311-694/40034

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