United States Department of Agriculture

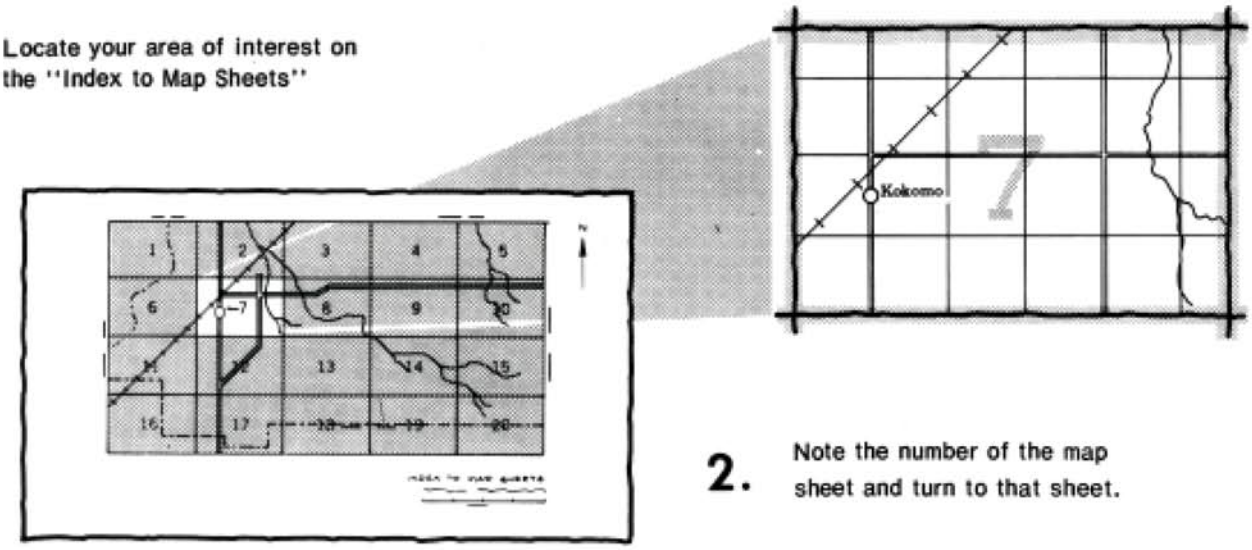
Soil Conservation Service

In cooperation with the Alabama Agricultural Experiment Station, and the Alabama Soil and Water Conservation Committee

Soil Survey of Monroe County, Alabama

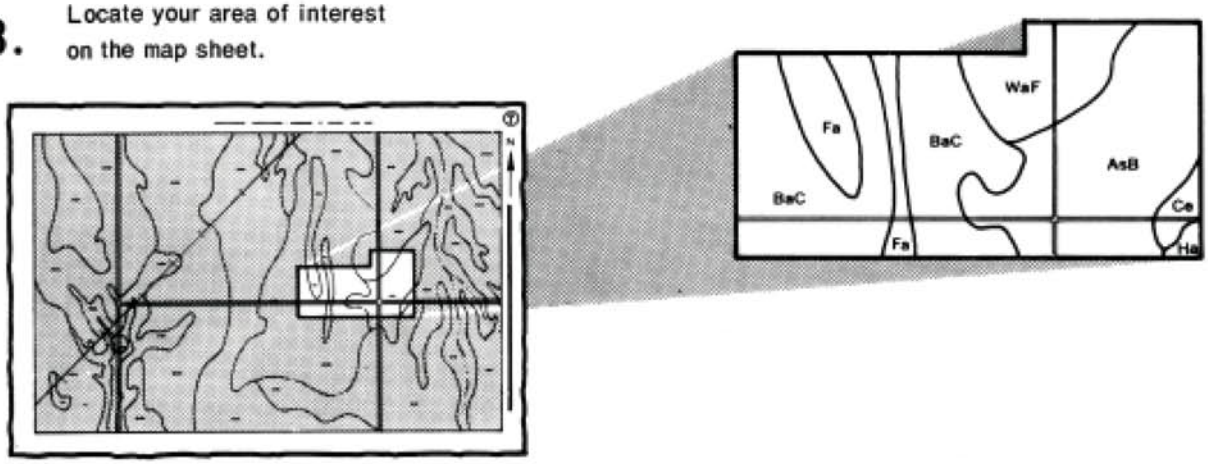
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"

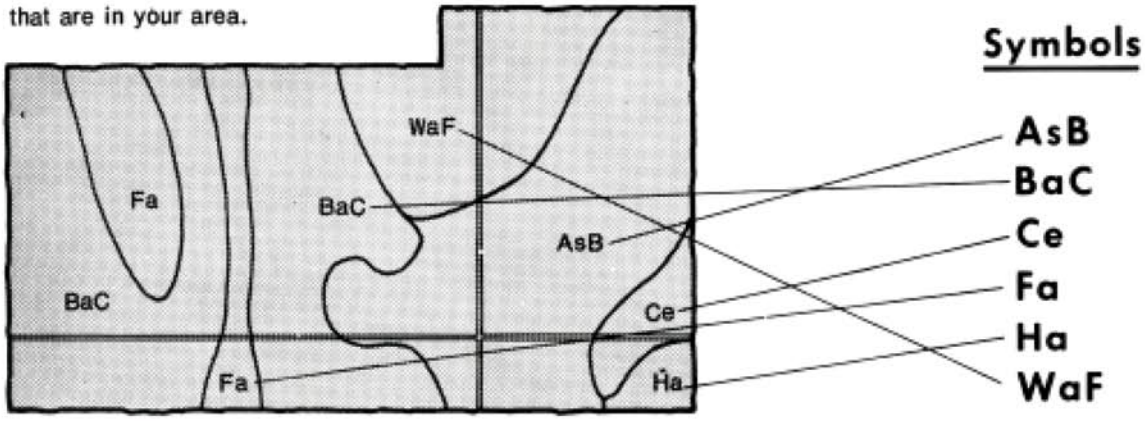


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

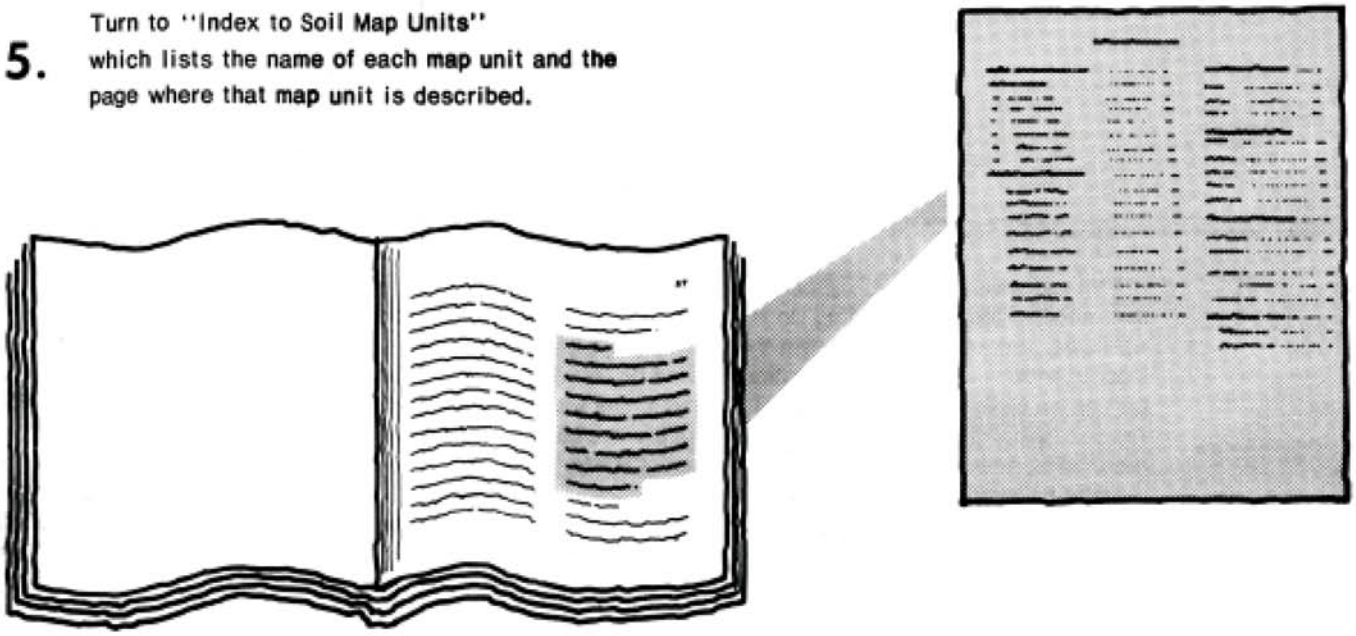


4. List the map unit symbols that are in your area.

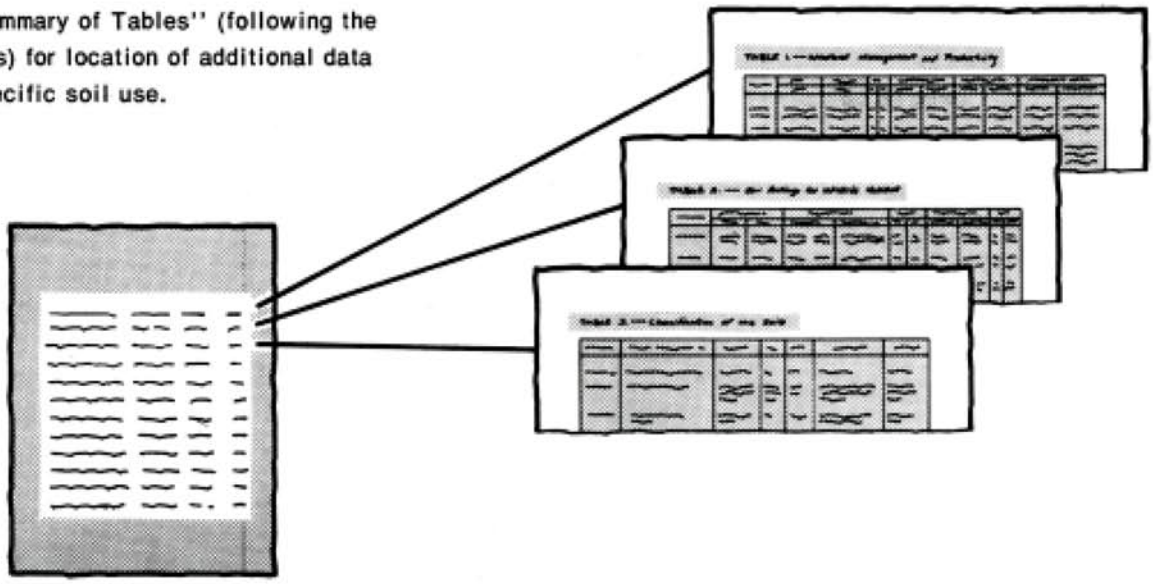


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1983. Soil names and descriptions were approved in 1984. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1983. This soil survey was made cooperatively by the Soil Conservation Service, the Alabama Agricultural Experiment Station, the Alabama Cooperative Extension Service, the Alabama Soil and Water Conservation Committee, and the Alabama Department of Agriculture and Industries. It is part of the technical assistance furnished to the Monroe County 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.

An earlier soil survey of Monroe County was published in 1916. This survey updates the first survey and provides additional information.

Cover: Pecan orchard and pasture in an area of Malbis fine sandy loam, 1 to 5 percent slopes.

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Soil Series

Issued October 1986

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Summary of Tables

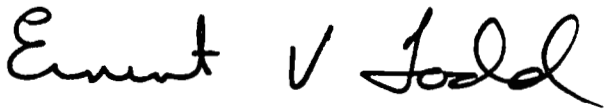
Foreword

This soil survey contains information that can be used in land-planning programs in Monroe County, Alabama. 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.

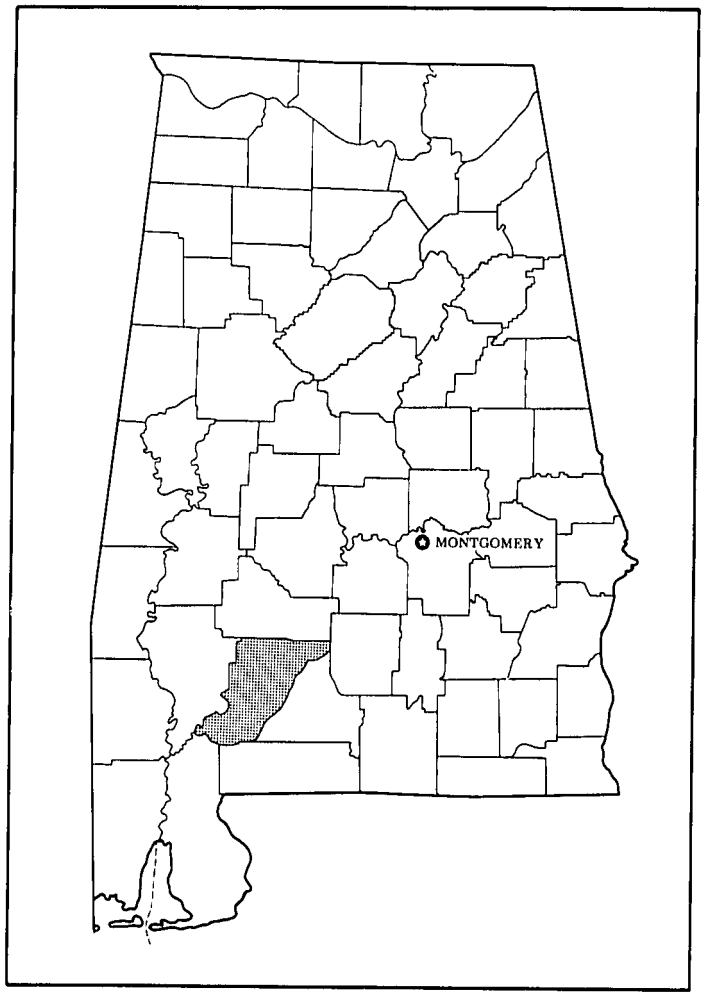
This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use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

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

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



Ernest V. Todd
State Conservationist
Soil Conservation Service



Location of Monroe County in Alabama.

Soil Survey of Monroe County, Alabama

By Lewis A. Dungan, Soil Conservation Service

Fieldwork by Lewis A. Dungan, Willard J. Reeves, and Gregory R. Brannon, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service, in cooperation with the Alabama Agricultural Experiment Station and the Alabama Soil and Water Conservation Committee

General Nature of the Survey Area

MONROE COUNTY is in the central part of southwestern Alabama. Exclusive of water areas of more than 40 acres in extent and streams more than 1/8 mile wide, the county has a total of 652,295 acres, or 1,019.2 square miles. In 1980, the population of the county was 22,651 *(2)*. Monroeville is the county seat.

The county is within the Southern Coastal Plain Land Resource Area. Soils formed from marine and fluvial sediments. Most of the soils in the county are influenced by the Alabama River, which flows across and drains the western part of the county; Big Escambia Creek, which drains the southeastern part of the county; and numerous other creeks that flow throughout the county. Elevations range from about 20 feet in the southwestern part of the county to about 580 feet in the northeastern part near Midway.

Monroe County and additional lands were ceded by the Treaty of Fort Jackson on August 9, 1814, from William Weatherford (Chief Red Cloud) representing the Creek Indians to General Andrew Jackson *(6)*. In 1815, Monroe County was organized, and Claiborne became the county seat. The county seat was moved to Monroeville in 1832.

The county is served by two railroads, U.S. Highway 84, and numerous state and local roads. The Alabama River is navigable throughout its length in Monroe County, and port facilities are at Claiborne state docks.

Natural Resources

Soil is the most important natural resource in Monroe County. Livestock, crops, and timber are marketable products.

In most of the county, water is adequate for domestic and livestock use. The Alabama River and other perennial streams, supplemented by wells and springs, provide adequate water. There are many farm ponds throughout the county. Water recreation has become a major source of revenue along the Alabama River and at Natchez State Lake and Little River State Park.

Petroleum, natural gas, and limestone have been mined in the county. Clay and lignite are available to be mined *(8)*.

Farming History

Monroe County was originally a mixed forest of oak, hickory, longleaf and shortleaf pine, chestnut, walnut, and other hardwoods. The first settlers in the county produced mainly food crops, such as corn, oats, potatoes, wheat, vegetables, and rice. Some tobacco was also grown. However, cotton soon became the principal cash crop. The first two areas farmed, along Big Flat Creek and the area north of it, are now used mostly for pasture and timber production. The Citronelle Formation and the terraces adjacent to the Alabama

River were the next areas developed for agricultural uses. These areas are the most intensely farmed.

Climate

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

Monroe County has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short. Cold waves are rare and generally moderate in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation, mainly afternoon thunderstorms, is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Frisco City, Alabama, in the period 1951 to 1980. 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 49 degrees F, and the average daily minimum temperature is 38 degrees. The lowest temperature on record, which occurred at Frisco City on January 19, 1977, is 4 degrees. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 91 degrees. The highest recorded temperature, which occurred at Frisco City on August 14, 1954, is 107 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 annual precipitation is 59 inches. Of this, 31 inches, or 55 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 24 inches. The heaviest 1-day rainfall during the period of record was 10.61 inches at Frisco City on September 8, 1974. Thunderstorms occur on about 61 days each year, and most occur in summer.

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 heaviest 1-day snowfall on record was 3 inches.

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 south. Average windspeed is highest, 9 miles per hour, in spring.

Severe local storms, including tornadoes, strike occasionally in or near the area. They are short in duration and cause variable and spotty damage. Every few years, in summer or autumn, a tropical depression or remnant of a hurricane that has moved inland causes extremely heavy rains for 1 to 3 days.

Geology

Geologic formations in Monroe County are of sedimentary origin and range in age from Eocene to Holocene. They consist mainly of gravel, sand, clay, sandstone, siltstone, clay stone, and limestone. Geologic map units in the county include, from oldest to youngest, the Nanafalia, Tuscahoma, Hatchetigbee, and Tallahatta Formations; the Lisbon Formation and Gosport Sand undifferentiated, and the Jackson Group in the Eocene Series; the Oligocene Series undifferentiated; the Miocene Series undifferentiated; the Citronelle Formation in the Pliocene Series; and alluvium and terrace deposits in the Pleistocene and Holocene Series *(8)*.

The Nanafalia Formation is in northeastern Monroe county. Arundel, Halso, and Luverne soils are the dominant soils on this formation. The formation is 200 to 225 feet thick at the surface, but only the upper 20 to 40 feet are exposed in Monroe County.

The Tuscahoma Sand overlies the Nanafalia Formation and crops out in northern parts of the county. The formation is 250 to 275 feet thick in the outcrops. Beatrice and Luverne soils are the dominant soils.

The Hatchetigbee Formation overlies the Tuscahoma Sand and crops out in a belt across the northern part of the county. It is very similar lithologically to the Tuscahoma Sand. Beatrice and Luverne soils are the dominant soils. The formation generally ranges from 135 feet thick in the eastern part of the county to 275 feet thick in the western part.

The Tallahatta Formation overlies the Hatchetigbee Formation and forms a north- and east-facing escarpment across the northern part of the county. Arundel soils occur on this escarpment. This formation is less than 100 feet thick. It has a claystone or buhrstone base.

The Gosport Sand and Lisbon Formation overlies the Tallahatta Formation and crops out in the central part of the county. Saffell, Lucy, and Greenville soils are the dominant soils.

The Jackson Group crops out in the central part of the county. It ranges from 35 feet thick in updip areas to 125 feet thick in the western part of the county. Saffell, Lucy, and Greenville soils are the dominant soils.

The Oligocene Series overlies the Jackson Group and crops out in the central and southwestern parts of Monroe County. Saffell, Bama, and Lucy soils are the dominant soils, but where the Mariann Limestone part of this series outcrops, Prim soils are dominant.

The Miocene Series overlies the Oligocene Series and is exposed in the southern part of the county. Bama, Saffell, Malbis, and Lucy soils are the dominant soils.

The Citronelle Formation overlies the Miocene Series in the southern part of the County. It is 5 to 50 feet thick. Lucedale, Malbis, and Escambia soils are the dominant soils.

High terrace deposits of the Pleistocene Series cap upland areas along the Alabama River. The deposits are 5 to 50 feet thick. Malbis and Bama soils are the dominant soils.

Alluvium of the Holocene Series are on flood plains. The dominant soils are Urbo, Chrysler, and Congaree soils along the Alabama River; Iuka and Mantachie soils along Limestone, Big Flat, Robinson, and Tallahatchee Creeks; and Bibb soils along Little River, Big Escambia and Cotley creeks, and other streams and creeks in the southern part of Monroe County.

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.

Before the actual fieldwork began, preliminary boundaries of landforms were plotted stereoscopically on high altitude aerial photographs at a scale of 1:80,000 and enlarged to a scale of 1:20,000. U.S. Geographical Survey maps, photographs, and soil surveys produced since 1916 for conservation planning were studied to relate land and image features. A vehicle reconnaissance was made before traversing and transecting the surface.

Traverses were made on foot along the Alabama River and its tributaries and in the east central and northwest part of the county. These areas were surveyed by a random transect method *(9)* and random observations were made by vehicle on the existing network of roads. Traverses on foot and by vehicle were made in the rest of the survey area. Most of the traverses were made at intervals of about one-fourth mile, but traverses at closer intervals were made in areas of high variability. Areas of high variability are in general soil map units 1 and 2. Soil examinations along the traverses were made 100 and 400 yards apart, depending on the landscape and soil pattern *(7)*.

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units)*(12)*. 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 interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management

were assembled from farm records and from field or plot experiments on the same kinds of soil.

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

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

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. 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 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 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. Table 4 shows the extent of the map units shown on the general soil map. It lists the suitability of each, in relation to that of the other map units, for major land uses and shows soil properties that limit use. Soil suitability ratings are based on the practices commonly used in the survey area to overcome soil limitations. These ratings reflect the ease of overcoming the limitations. They also reflect the problems that will persist even if such practices are used.

Each map unit is rated for *cultivated crops, pasture, woodland, urban uses,* and *recreation areas.* Cultivated crops are those grown extensively in the survey area. Pasture crops are the grasses grown extensively in the survey area. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments. Intensive recreation areas are campsites, picnic areas, ball fields, and other areas that are subject to heavy foot traffic. Extensive recreation areas are those used for nature study and as wilderness.

Nearly Level to Sloping Soils on Upland Alabama River Terraces and the Citronelle Formation

The two map units in this group make up about 17 percent of the county. The soils generally have good suitability for use as farmland, woodland, and pasture and for recreation use. They have fair to good suitability for urban use.

1. Lucedale-Malbis-Escambia

Well drained, moderately well drained, and somewhat poorly drained, loamy soils formed in coastal plain marine sediments

This map unit makes up about 10 percent of the county. It is about 32 percent Lucedale soils, 30 percent Malbis soils, 10 percent Escambia soils, and 28 percent soils of minor extent.

The Lucedale, Malbis, and Escambia soils are on fairly broad, flat ridgetops of the Citronelle Formation that extends from Monroeville south into Escambia County. The drainage systems are poorly defined. Slopes are 0 to 8 percent.

Lucedale soils are on higher elevations than Malbis and Escambia soils. The Lucedale soils are well drained. They have a dark reddish brown loam surface layer and a dark red sandy clay loam subsoil.

Malbis soils are on broad plateaus. These soils are moderately well drained. They have a very dark grayish brown loam surface layer. The subsoil is yellowish brown sandy clay loam and clay loam and is mottled in the lower part.

Escambia soils are on interstream divides. These soils are somewhat poorly drained. They have a gray very fine sandy loam surface layer. The subsoil is loam. It is pale brown and has gray mottles in the upper part and is mottled in shades of gray, brown, and red in the lower part.

Of minor extent in this map unit are Poarch, Atmore, Grady, and Bama soils. Poarch, Atmore, and Grady soils are in depressional areas of uplands. Bama soils are on ridgetops.

The soils in this map unit are used mainly for cultivated crops, woodland, pasture, and urban uses.

2. Malbis-Bama

Moderately well drained and well drained, loamy soils formed in coastal plain old stream sediments

This map unit makes up about 7 percent of the county. It is about 60 percent Malbis soils, 32 percent Bama soils, and 8 percent soils of minor extent.

The Malbis and Bama soils are on fairly broad, flat ridgetops on terraces of the Alabama River. The

drainage systems are poorly defined. Slopes are 0 to 10 percent.

Malbis soils are on broad plateaus. These soils are moderately well drained. They have a very dark grayish brown loam surface layer and a yellowish brown sandy clay loam and clay loam subsoil. The lower part of the subsoil has mottles.

Bama soils are on higher elevations than Malbis soils. The Bama soils are well drained. They have a brown sandy loam surface layer and a yellowish red and red sandy clay loam subsoil.

Of minor extent in this map unit are Poarch, Escambia, Atmore, Grady, Benndale, and Lucedale soils. Poarch, Escambia, Atmore, and Grady soils are in depressional areas of uplands. Benndale and Lucedale soils are on uplands.

The soils in this map unit are used mainly for cultivated crops, woodland, and pasture.

Nearly Level to Steep Soils on Dissected Plateaus

The two map units in this group make up about 43 percent of the county. The soils generally have fair to poor suitability for use as farmland. They have fair to good suitability for use as pasture and woodland and good to poor suitability for recreation and urban uses.

3. Saffell-Bama-Bibb

Well drained and poorly drained, gravelly and loamy soils formed in fluvial, marine, and alluvial sediments

This map unit makes up about 30 percent of the county. It is about 40 percent Saffell soils, 20 percent Bama soils, 15 percent Bibb soils, and 25 percent soils of minor extent.

The Saffell, Bama, and Bibb soils are on highly dissected old plateaus of stream and marine origin mainly south of Limestone Creek. One large area of these soils is in the northwestern part of the county. Ridgetops and drainageways are narrow, and side slopes are steep. Slopes are 0 to 35 percent.

Saffell soils are on side slopes. These soils are well drained. They have a dark grayish brown very gravelly sandy loam surface layer and a yellowish red and red very gravelly sandy loam and sandy clay loam subsoil. The underlying material is yellowish red, stratified very gravelly sandy loam, loamy sand, and sand.

Bama soils are on ridges. These soils are well drained. They have a brown sandy loam surface layer and a yellowish red and red sandy clay loam subsoil.

Bibb soils are on flood plains. These soils are poorly drained. They have a dark grayish brown loam surface layer. The underlying material is gray, stratified loamy sand, sandy loam, and sandy clay loam.

Of minor extent in this map unit are Lucy, Malbis, and Lucedale soils. Lucy soils are on side slopes, and Malbis and Lucedale soils are on uplands.

The soils in this map are used mainly as woodland.

4. Saffell-Lucy-Greenville

Well drained, gravelly, loamy, and clayey soils formed in marine and fluvial sediments

This map unit makes up about 12 percent of the county. It is about 30 percent Saffell soils, 28 percent Lucy soils, 12 percent Greenville soils, and 30 percent soils of minor extent.

Saffell, Lucy, and Greenville soils are on highly dissected uplands in the east-central part of the county. These uplands have ridgetops, steep side slopes, and narrow drainageways. The ridgetops are fairly smooth. Slopes are 2 to 35 percent.

Saffell soils are on side slopes. These soils are well drained. They have a dark grayish brown very gravelly sandy loam surface layer and a yellowish red and red very gravelly sandy loam and sandy clay loam subsoil. The underlying material is yellowish red, stratified very gravelly sandy loam, loamy sand, and sand.

Lucy soils are on ridges and side slopes. These soils are well drained. They have a dark grayish brown loamy sand surface layer and a yellowish brown loamy sand subsurface layer. The subsoil is strong brown, yellowish red, and red sandy loam and sandy clay loam.

Greenville soils are on ridges. These soils are well drained. They have a dark reddish brown sandy loam surface layer and a dark red clay loam and clay subsoil.

Of minor extent in this map unit are Bama, Bibb, Iuka, Luverne, and Troup soils. The Bama soils are on ridgetops, and Luverne and Troup soils are on side slopes. Bibb and Iuka soils are on flood plains.

The soils in the map unit are used mainly as woodland, pasture, and for cultivated crops (fig. 1).

Gently Sloping to Moderately Steep Soils on Broad Ridges

The one map unit in this group makes up about 17 percent of the county. The soils in this map unit generally have poor suitability for use as farmland and for urban uses. They have good suitability for use as pasture and woodland and for recreation uses.

5. Luverne-Beatrice-Halso

Well drained and moderately well drained, clayey soils formed in marine and old lakebed sediments

This map unit makes up about 17 percent of the county. It is 50 percent Luverne soils, 27 percent Beatrice soils, 9 percent Halso soils, and 14 percent soils of minor extent.

Luverne, Beatrice, and Halso soils are in the northeastern part of the county. The ridgetops are fairly wide and rolling. The side slopes are generally smooth. They are dissected by narrow drainageways. Slopes are 1 to 25 percent.

Luverne soils are on ridges and hill slopes. These soils are well drained. They have a brown sandy loam surface

Figure 1.—Coastal bermudagrass on Lucy loamy sand, 1 to 5 percent slopes. Wooded area is on Saffell very gravelly sandy loam, 8 to 15 percent slopes.

layer and a yellowish red clay subsoil. The underlying material is yellowish red, yellowish brown, and gray, stratified sandy loam, sandy clay loam, and clayey shale.

Beatrice soils are on concave and convex upland plateaus. These soils are moderately well drained. They have a dark grayish brown silt loam surface layer. The subsoil is clay. It is red in the upper part and is mottled yellowish red, yellowish brown, red, and light gray in the lower part. The underlying material is a light olive gray shaly clay and has red and yellowish brown mottles.

Halso soils are on convex upland ridges. These soils are moderately well drained. They have a brown fine sandy loam surface layer. The subsoil is clay. It is dark red in the upper part and is yellowish red and has light brownish gray and light yellowish brown mottles in the lower part. The upper part of the underlying material is mottled yellowish red, light olive gray, and yellowish brown clayey shale that has pockets of clay loam in the upper part. The lower part is mottled, light brownish gray, yellowish brown, and yellowish red clayey shale.

Of minor extent in this map unit are Arundel, Bama, Iuka, Malbis, and Mantachie soils. Arundel soils are on side slopes, and Bama and Malbis soils are on ridgetops. Iuka and Mantachie soils are on flood plains.

The soils in this map unit are used mainly as woodland. Some of the less sloping areas have been cleared, and the soils are used for pasture or cultivated crops.

Sloping to Steep Soils on Narrow Ridges

The one map unit in this group makes up about 6 percent of the county. The soils in this map unit generally have poor suitability for use as farmland and pasture, and for recreation and urban uses. They have good to fair suitability for use as woodland.

6. Arundel-Luverne

Well drained, clayey soils formed in marine sediments underlain by sandstone, buhrstone, and siltstone

This map unit makes up about 6 percent of the county. It is about 75 percent Arundel soils, 10 percent Luverne soils, and 15 percent soils of minor extent.

Arundel and Luverne soils are on highly dissected ridges in the northern part of the county. The ridgetops

are long and narrow and rolling. The side slopes are steep and rough. They are dissected by many drainageways. slopes are 10 to 35 percent.

Arundel soils are on side slopes. These soils are well drained. They have a dark grayish brown loam surface layer. The subsoil is brown clay in the upper part and brown clay that has yellowish red mottles in the lower part. The underlying material is pale olive siltstone.

Luverne soils are on ridges and higher on side slopes than Arundel soils. These soils are well drained. They have a brown sandy loam surface layer and a yellowish red clay subsoil. The underlying material is yellowish red, yellowish brown, and gray, stratified sandy loam, sandy clay loam, and clay shale.

Of minor extent in this map unit are Bama, Beatrice, Iuka, Lucy, Mantachie, and Saffell soils. Bama, Lucy, and Saffell soils are mainly on ridgetops, and Beatrice soils are in lower positions on side slopes than Arundel and Luverne soils. Iuka and Mantachie soils are on flood plains.

The soils in this map unit are used mainly as woodland.

Nearly Level to Gently Sloping Soils on Stream Terraces and Flood Plains

The two map units in this group make up about 18 percent of the county. The soils generally have fair to poor suitability for use as farmland and for recreation uses. They have good suitability for use as woodland and pasture and poor suitability for urban uses.

7. Iuka-Mantachie

Moderately well drained and somewhat poorly drained, loamy soils formed in alluvial and fluvial sediments

This map unit makes up about 8 percent of the county. It is about 60 percent Iuka soils, 20 percent Mantachie soils, and 20 percent soils of minor extent.

Iuka and Mantachie soils are on nearly level flood plains along the larger streams in the northern part of the county. The landscape is smooth and has poorly defined drainageways in most areas. Slopes are 0 to 2 percent.

Iuka soils are on higher elevations than Mantachie soils. These soils are moderately well drained. They have a light gray loamy sand surface layer and mottled light yellowish brown, brown, reddish yellow, and light gray loamy underlying material.

Mantachie soils are on lower elevations. These soils are somewhat poorly drained. They have a brown loam surface layer and mottled brown, light gray, yellowish brown, and pale brown clay loam subsoil.

Of minor extent in this map unit are Bibb, Lenoir, Smithton, and Stough soils. Bibb soils are on flood plains. Lenoir soils are on low terraces between the frequently flooded, lower lying, young fluvial soils and the older, upland soils. Smithton and Stough soils are on adjacent stream terraces.

The soils in this map unit are used mainly as woodland.

8. Urbo-Chrysler-Congaree

Somewhat poorly drained, moderately well drained, and well drained, clayey and loamy soils formed in alluvial and fluvial sediments

This map unit makes up about 10 percent of the county. It is about 28 percent Urbo soils, 18 percent Chrysler soils, 11 percent Congaree soils, and 43 percent soils of minor extent.

Urbo, Chrysler, and Congaree soils are on stream terraces and flood plains along the Alabama River and its tributaries. The landscape is smooth and has numerous old channels and depressions and many back sloughs that have very poor outlets or no outlets. Slopes are 0 to 5 percent.

Urbo soils are on lower elevations than Chrysler and Congaree soils. These soils are somewhat poorly drained. They have a brown silty clay loam surface layer. The subsoil is mottled brown, light brownish gray, and gray silty clay loam and silty clay.

Chrysler soils are on intermediate elevations. These soils are moderately well drained. They have a brown silt loam surface layer. The subsoil is yellowish red silty clay in the upper part and mottled red, yellowish red, yellowish brown, and light gray clay in the lower part. The underlying material is mottled red, light gray, yellowish red, and yellowish brown, stratified loam, sandy loam, sandy clay loam, clay loam, and clay.

Congaree soils are on higher elevations than Urbo and Chrysler soils. These soils are well drained. They have a brown loam surface layer and brown and dark yellowish brown loam, silt loam, and fine sandy loam underlying material.

Of minor extent in this map unit are Bigbee, Cahaba, Iuka, Mantachie, Lenoir, Smithton, Stough, and Una soils. Cahaba, Lenoir, Smithton, and Stough soils are on stream terraces. Iuka and Mantachie soils are on flood plains that are frequently flooded. Una soils are in depressional sloughs and old stream channels. Bigbee soils are in crevasses.

The soils in this map unit are used mainly as woodland.

Detailed Soil Map Units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Malbis loam, 0 to 1 percent slopes, is one of several phases in the Malbis series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Bama-Urban land complex, 1 to 10 percent slopes, 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. Iuka and Mantachie soils, 0 to 2 percent, 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.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

ArF—Arundel loam, 8 to 35 percent slopes. This moderately deep, well drained soil is on narrow upland ridges and side slopes in the northern part of the county. Areas of cobble piles and stone piles are common. Slopes are complex and convex. The mapped areas are 100 to more than 500 acres.

Typically, the surface layer is dark grayish brown loam about 5 inches thick. The subsoil is brown clay to a depth of about 18 inches and brown clay loam to a depth of 22 inches. The underlying material is moderately hard, fragmented, clayey shale to a depth of 60 inches.

Important soil properties:

Permeability: very slow
Available water capacity: medium
Soil reaction: extremely acid to strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Beatrice, Bama, and Troup soils. Also included are areas of soils similar to Arundel soil except they have more than 20 percent cobbles or are shallow to bedrock. The included soils make up about 25 percent of the map unit, but individual areas are less than 10 acres. Bama, Beatrice, and Troup soils are contrasting soils, and their use and management differ from Arundel soil. The

contrasting soils make up about 10 percent of the map unit.

This Arundel soil is used as woodland.

This soil is not suited to cultivated crops. Slope, the narrow moisture range for cultivation, and the severe hazard of erosion are limitations.

This soil is poorly suited to pasture and hay. The severe hazard of erosion is a concern in management. The included cobbly soils limit pasture mowing for weed and brush control and forage cutting.

Coniferous trees are suited to this soil. Loblolly pine and shortleaf pine are recommended trees to plant. This soil has moderate equipment limitations, seedling mortality, and windthrow hazard. These limitations are because of the clayey subsoil, the depth to rock, and the moderately steep slopes. These limitations are difficult to overcome.

This soil is not suited to most building site development nor to the construction of most sanitary facilities. Depth to rock, very slow permeability, the clayey subsoil, and slope are severe limitations. Low strength is a limitation for local roads and streets. These limitations are very difficult to overcome for some of these uses.

This Arundel soil is in capability subclass VIIe and in woodland group 3c.

AtA—Atmore silt loam, 0 to 1 percent slopes. This deep, poorly drained soil is in upland depressional areas and on toe slopes in the southern part of the county. Slopes are smooth and convex. The mapped areas are 5 to 100 acres.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The subsurface layer is light brownish gray very fine sandy loam to a depth of 6 inches. The subsoil extends to a depth of 68 inches. It is light gray fine sandy loam that is mottled in shades of brown to a depth of 40 inches and mottled fine sandy loam and clay loam that is 10 to 15 percent by volume nodular plinthite to a depth of 68 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: medium
Soil reaction: extremely acid to strongly acid
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches but restricted below a depth of about 30 inches
Water table: at or near the surface during winter and early in spring
Flooding frequency: none

Included with this soil in mapping are a few small areas of Bibb, Escambia, and Malbis soils. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 3 acres.

This Atmore soil is used primarily as woodland. Some areas are used for pasture.

This soil is poorly suited to cultivated crops because of wetness. Crops grown on this soil need to be tolerant of wetness.

This soil is suited to pasture and hay. The seasonal high water table is a limitation. Subsurface and surface drainage help to lower the seasonal high water table. The recommended interval for surface and subsurface drains is 80 to 120 feet, but outlets can be difficult to locate. Deferred grazing during wet periods helps to prevent soil compaction by livestock.

Coniferous and deciduous trees are suited to this soil. Loblolly pine, slash pine, and sweetgum are recommended trees to plant. Because of the high water table, this soil has severe equipment limitations and moderate seedling mortality. The equipment limitations can be partly overcome by harvesting and planting during dry seasons. Bedding can reduce seedling mortality.

This soil is poorly suited to most building site development and to the construction of sanitary facilities. Wetness is a severe limitation that is difficult to overcome.

This Atmore soil is in capability IVw and in woodland group 2w.

BaB—Bama sandy loam, 1 to 5 percent slopes. This deep, well drained soil is on broad ridges throughout the county. Slopes are long, smooth, and convex. The mapped areas are 10 to more than 100 acres.

Typically, the surface layer is brown sandy loam about 6 inches thick. The next layer is yellowish red sandy loam to a depth of 13 inches. The subsoil is sandy clay loam to a depth of more than 65 inches. It is yellowish red to a depth of 40 inches and red to a depth of 65 inches or more.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid to strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: more than 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Lucy, Malbis, and Saffell soils. Also included are soils similar to Bama soil except they are moderately well drained. The included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres. Lucy and Malbis soils are contrasting soils, and

their use and management differ from Bama soil. The contrasting soils make up about 5 percent of the map unit.

This Bama soil is used primarily for cultivated crops, pasture, or hay. Some areas are used as woodland.

This soil is well suited to cultivated crops. Slope and the moderate hazard of erosion are limitations. No-till, minimum tillage, terraces, contour farming, and the use of cover crops reduce runoff and help to control erosion. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. There are no significant concerns in management.

This soil is well suited to most building site development and to the construction of sanitary facilities. Seepage and slope are moderate limitations for sewage lagoon areas, but these limitations can be overcome by proper design.

This Bama soil is in capability subclass IIe and in woodland group 2o.

BaC—Bama sandy loam, 5 to 10 percent slopes. This deep, well drained soil is on ridges and side slopes throughout the county. Slopes are long, smooth, and convex. The mapped areas are 10 to more than 50 acres.

Typically, the surface layer is brown sandy loam about 6 inches thick. The next layer is yellowish red sandy loam to a depth of 13 inches. The subsoil is sandy clay loam to a depth of more than 65 inches. It is yellowish red to a depth of 40 inches and red to a depth of about 65 inches.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: more than 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Lucy, Malbis, and Saffell soils. Also included are soils similar to Bama soil except they have a thicker surface layer. The included soils make up about 20 percent of the map unit, but individual areas are generally less than 5 acres. Lucy and Malbis soils are contrasting soils, and their use and management differ from Bama soil. The contrasting soils make up about 5 percent of the map unit.

This Bama soil is used primarily as woodland or for pasture or hay. Some areas are used for cultivated crops.

This soil is suited to cultivated crops. Slope and the severe hazard of erosion are limitations. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. Terraces also help to control erosion, but the undulating shape of the surface in most areas makes construction difficult. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. There are no significant concerns in management.

This soil is well suited to most building site development and to the construction of sanitary facilities. Slope is a severe limitation for sewage lagoon areas, but this limitation can be overcome by proper design.

This Bama soil is in capability subclass IIIe and in woodland group 2o.

BbC—Bama-Urban land complex, 1 to 10 percent slopes. This complex consists of deep, well drained Bama soil and areas of Urban land on broad upland ridges and side slopes in the central part of Monroe County. The areas of Bama soil and Urban land are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Slopes are smooth and convex. The mapped areas are 40 to 200 acres.

Bama soil and similar soils make up about 60 percent of the map unit. Typically, the surface layer is brown sandy loam about 6 inches thick. The next layer is yellowish red sandy loam to a depth of 13 inches. The subsoil is sandy clay loam to a depth of more than 65 inches. It is yellowish red to a depth of about 40 inches and red to a depth of about 65 inches. The similar soils have been altered by grading or by having excavated subsoil spread over the surface.

Urban land makes up about 30 percent of the map unit. The areas of soils are covered by houses, buildings, streets, and parking areas. In many areas the original soil was altered by cutting and filling, shaping and grading, excavating, or compacting. In other areas the original soil was covered with structures, asphalt, or concrete.

Important soil properties of Bama soil:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid to strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low

Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: more than 6 feet
Flooding frequency: none

Included with this complex in mapping are a few small areas of Lucedale and Malbis soils. The included soils make up about 10 percent of the map unit, but individual areas generally are 5 acres or less. Malbis soils are contrasting soils, and their use and management differ from Bama soil. The contrasting soils make up about 5 percent of the map unit.

Bama soil is well suited to most recreation uses. In some areas, grading is needed for site preparation for intense recreation development. The surface layer needs to be removed before grading, stockpiling, and respreading to provide a good medium for plants.

Bama soil is suited to residential and industrial use. In some areas, grading, cutting and filling, and excavating are needed for local roads and streets. There are no significant limitations for septic tank absorption fields, dwellings, and local roads and streets. Bama soils are suited to small commercial buildings, but some cutting and filling are needed on this gently sloping to sloping soil. Bama soil is well suited to most gardening and landscaping plants commonly grown in the area.

The Bama soil and Urban land are not assigned to a capability subclass or a woodland group.

BeB—Beatrice silt loam, 1 to 5 percent slopes. This deep, moderately well drained soil is on broad ridges in the northern part of the county. Slopes are smooth and convex or concave. The mapped areas are 200 to 500 acres or more.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The subsoil is red, yellowish red, and mottled yellowish red, red, yellowish brown, and light gray clay to a depth of 50 inches. The underlying material is mottled red, brown, and gray, stratified clayey and loamy material to a depth of about 72 inches.

Important soil properties:

Permeability: very slow
Available water capacity: medium
Soil reaction: extremely acid or very strongly acid except where the surface layer has been limed.
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches but restricted below a depth of about 50 inches
Water table: none within a depth of 6 feet, but the soil is saturated in winter and early in spring
Flooding frequency: none

Included with this soil in mapping are small areas of Arundel, Halso, and Luverne soils. The included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres. Luverne soils are contrasting soils, and their use and management differ from Beatrice soil. The contrasting soils make up about 5 percent of the map unit.

This Beatrice soil is used primarily as woodland. Some areas have been cleared and are used for cultivated crops, pasture, or hay.

This soil is poorly suited to cultivated crops. The clayey subsoil and the moderate hazard of erosion are limitations. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. Terraces help to control erosion, but the undulating shape of the surface in some areas makes construction difficult. Good tilth is best maintained by returning crop residue to the soil.

This soil is suited to pasture and hay. The hazard of erosion is a concern in management.

Coniferous and deciduous trees are well suited to this soil. Loblolly pine, sweetgum, and water oak are recommended trees to plant. The clayey subsoil is a moderate equipment limitation.

This soil is not suited to most building site development nor to the construction of most sanitary facilities. Permeability is a severe limitation for septic tank absorption fields. Shrinking and swelling (fig. 2) and the clayey subsoil are severe limitations for most urban uses. Low strength is a severe limitation for local roads and streets. These limitations are difficult to overcome.

This Beatrice soil is in capability subclass IIIe and in woodland group 2c.

BeC—Beatrice silt loam, 5 to 10 percent slopes. This deep soil is on ridges and side slopes in the northern part of the county. Slopes are smooth and convex. The mapped areas are 500 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown sandy loam about 3 inches thick. The subsoil is red clay to a depth of 50 inches. The underlying material is mottled red, brown, and gray, stratified clayey and loamy material to a depth of about 70 inches.

Important soil properties:

Permeability: very slow
Available water capacity: medium
Soil reaction: extremely acid or very strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches but restricted below a depth of about 50 inches
Water table: none within a depth of 6 feet, but the soil is saturated in winter and early in spring
Flooding frequency: none

Figure 2.—Cracks in a house built on Beatrice silt loam, 1 to 5 percent slopes. The high shrink-swell potential is a severe limitation for building site development.

Included with this soil in mapping are small areas of Arundel, Halso, and Luverne soils. These soils make up about 20 percent of the map unit, but individual areas are generally less than 5 acres. Luverne soils are contrasting soils, and their use and management differ from Beatrice soil. The contrasting soils make up about 5 percent of the map unit.

This Beatrice soil is used primarily as woodland. Some areas have been cleared and are used for pasture or hay.

This soil is poorly suited to cultivated crops. Slope, the clayey subsoil, and the severe hazard of erosion are limitations. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. Terraces help to control erosion, but the undulating shape of the surface in some areas makes construction difficult. Good tilth is best maintained by returning crop residue to the soil.

This soil is suited to pasture or hay. The hazard of erosion is a concern in management.

Coniferous and deciduous trees are well suited to this soil. Loblolly pine, sweetgum, and water oak are recommended trees to plant. The clayey subsoil is a moderate limitation to use of equipment.

This soil is not suited to most building site development nor to the construction of most sanitary facilities. Permeability is a severe limitation for septic tank absorption fields. Shrinking and swelling and the clayey subsoil are severe limitations for most urban uses. Low strength is a severe limitation for local roads and streets. These limitations are difficult to overcome.

This Beatrice soil is in capability subclass IVe and in woodland group 2c.

BnB—Benndale sandy loam, 1 to 5 percent slopes. This deep, well drained soil is on uplands in the southern part of the county. Slopes are smooth and slightly convex. The mapped areas are 8 to 50 acres.

Typically, the surface layer is grayish brown sandy loam about 5 inches thick. The next layer is pale brown sandy loam to a depth of about 10 inches. The subsoil extends to a depth of more than 64 inches. It is light yellowish brown, yellowish brown, and strong brown sandy loam to a depth of about 57 inches and light yellowish brown sandy clay loam to a depth of about 64 inches.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Lucy, Malbis, and Saffell soils. Also included are soils similar to Benndale soil except they have a yellowish red subsoil. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 10 acres. Malbis and Saffell soils are contrasting soils, and their use and management differ from Benndale soil. The contrasting soils make up about 8 percent of the map unit.

This Benndale soil is primarily used as woodland. Some areas have been cleared and are used for cultivated crops, hay, or pasture.

This soil is well suited to cultivated crops. The hazard of erosion is slight. This soil responds well to no-till and minimum tillage. Tilth is best maintained by returning crop residue to the soil. When tilled, plowpans can form and restrict root growth of some annual crops. Although the available water capacity is medium, soil moisture is not always adequate for optimum plant growth during the growing season.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. There are no significant limitations for woodland use and management.

This soil is well suited to most building site development or to the construction of sanitary facilities. Seepage is a moderate limitation for sewage lagoon areas.

This Benndale soil is in capability subclass IIe and in woodland group 2o.

BrA—Bibb loam, 0 to 1 percent slopes, frequently flooded. This deep, poorly drained soil is on flood plains of most streams in the southern and central parts of the county. The mapped areas are 100 to more than 1,000 acres and are long and narrow.

Typically, the surface layer is dark grayish brown loam about 8 inches thick. The underlying material is gray sandy loam and stratified gray loamy sand and light gray sandy clay loam to a depth of 60 inches or more.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid to strongly acid
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: near the surface during winter and early in spring
Flooding frequency: frequent during winter and spring

Included with this soil in mapping are a few areas of Mantachie soils and soils similar to Bibb soil except they have more clay in the underlying material. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 10 acres. Mantachie soils are contrasting soils, and their use and management differ from Bibb soil. The contrasting soils make up about 10 percent of the map unit.

This Bibb soil is used primarily as woodland.

This soil is not suited to cultivated crops, pasture, and hay. Wetness and the hazard of frequent flooding are the main limitations.

Coniferous and deciduous trees are suited to this soil. Eastern cottonwood, loblolly pine, sweetgum, and yellow-poplar are recommended trees to plant. Because of the high water table and flooding, this soil has severe equipment limitations and seedling mortality. These limitations can be partly overcome by harvesting and planting during dry seasons.

This soil is poorly suited to most building site development and to the construction of sanitary facilities. Flooding and wetness are severe limitations that are difficult to overcome.

This Bibb soil is in capability subclass Vw and in woodland group 2w.

BsB—Bigbee sand, 0 to 5 percent slopes, occasionally flooded. This deep, excessively drained soil is on terraces adjacent to the Alabama River and its larger tributaries. The mapped areas are 10 to more than 60 acres.

Typically, the surface layer is dark grayish brown sand about 6 inches thick. The underlying material is sand. It is yellowish brown to a depth of 13 inches, reddish

yellow to a depth of 42 inches, and very pale brown to a depth of 80 inches.

Important soil properties:

Permeability: rapid
Available water capacity: low
Soil reaction: very strongly acid to medium acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: at a depth of between 3-1/2 and 6 feet during winter and early in spring
Flooding frequency: occasional during winter and early in spring

Included with this soil in mapping are a few areas of Cahaba, Chrysler, and Izagora soils. The included soils make up about 25 percent of the map unit, but individual areas are generally less than 10 acres. Cahaba, Chrysler, and Izagora soils are contrasting soils, and their use and management differ from Bigbee soil. The contrasting soils make up about 20 percent of the map unit.

This soil is used primarily as woodland. Some areas are used for pasture and hay.

This soil is poorly suited to cultivated crops. The low available water capacity is the main limitation.

This soil is suited to pasture and hay. The low available water capacity is a limitation, and deep-rooted plants, such as bahiagrass and bermudagrass, are best suited. Deferred grazing during dry periods helps keep the soil in good condition.

Coniferous trees are suited to this soil. Loblolly pine and longleaf pine are recommended trees to plant. This soil has moderate equipment limitations. The sandy texture restricts the use of wheeled equipment, especially if the soil is dry. Seedling mortality is severe because of droughtiness. These limitations can be partly overcome by harvesting and planting during wet seasons.

This soil is poorly suited to most building site development and to the construction of sanitary facilities. Flooding and seepage are severe limitations that are difficult to overcome. This soil is a probable source of sand and is good roadfill material.

This Bigbee soil is in capability subclass IIIs and in woodland group 2s.

CaA—Cahaba sandy loam, 0 to 2 percent slopes, occasionally flooded. This deep, well drained soil is on terraces adjacent to the Alabama River and its larger tributaries. Slopes are smooth and slightly convex. The mapped areas are 10 to 160 acres.

Typically, the surface layer is brown sandy loam about 9 inches thick. The subsoil is yellowish red sandy loam to a depth of about 14 inches and yellowish red sandy clay loam to a depth of about 50 inches. The underlying material is strong brown fine sandy loam to a depth of 80 inches.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid to medium acid
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: occasional during winter and early in spring

Included with this soil in mapping are small areas of Bigbee, Chrysler, and Stough soils. Also included are soils similar to Cahaba soil except they have a yellow subsoil or a less clayey subsoil. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres. Bigbee, Chrysler, and Stough soils are contrasting soils, and their use and management differ from Cahaba soils. These contrasting soils make up about 10 percent of the map unit.

This Cahaba soil is used as woodland or for cultivated crops, hay, or pasture.

This soil is well suited to cultivated crops. The hazard of erosion is slight. This soil responds well to no-till and minimum tillage. When tilled, plowpans can form and restrict root growth of some annual crops. Tilth is best maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous and deciduous trees are suited to this soil. Loblolly pine, slash pine, yellow-poplar, sweetgum, and American sycamore are recommended trees to plant. There are no significant limitations for woodland use and management.

This soil is not suited to most building site development or to the construction of sanitary facilities. Seepage is a severe limitation for sewage lagoon areas and is difficult to overcome. Flooding is a severe limitation for most urban uses.

This Cahaba soil is in capability subclass IIw and in woodland group 2o.

ChB—Chrysler silt loam, 0 to 5 percent slopes, occasionally flooded. This deep, moderately well drained soil is on stream terraces adjacent to the Alabama River and its larger tributaries. Slopes are smooth and slightly convex or slightly concave. The mapped areas are 10 to more than 100 acres.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil is yellowish red silty clay to a depth of about 14 inches. It is clay that is mottled in shades of brown, red, and gray to a depth of about 72 inches. The underlying material is stratified clayey and

loamy material that is mottled in shades of gray, red, and brown.

Important soil properties:

Permeability: slow
Available water capacity: medium
Soil reaction: very strongly acid or strongly acid
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: at a depth of between 1-1/2 and 3 feet during winter and early in spring
Flooding frequency: occasional during winter and early in spring

Included with this soil in mapping are areas of Cahaba, Lenoir, and Stough soils. Also included are areas of soils similar to Chrysler soil except they have a yellow subsoil. The included soils make up about 20 percent of the map unit, but individual areas are generally less than 5 acres. Cahaba and Stough soils are contrasting soils, and their use and management differ from Chrysler soil. The contrasting soils make up about 10 percent of the map unit.

This Chrysler soil is used primarily as woodland. Some areas have been cleared and are used for pasture or cultivated crops.

This soil is suited to cultivated crops. The seasonal high water table and flooding are limitations. Subsurface and surface drainage help to lower the seasonal water table. If Chrysler soil is tilled during winter and early in spring, the seasonal high water table needs to be lowered by subsurface drainage. Recommended intervals for subsurface drains are 80 to 120 feet.

This soil is well suited to pasture and hay. Fertilizing and harvesting are dependent on soil wetness. Deferred grazing during wet periods helps to prevent some soil compaction by livestock.

Coniferous and deciduous trees are suited to these soils. Loblolly pine, slash pine, sweetgum, American sycamore, yellow-poplar, and water oak are recommended trees to plant. Chrysler soil has moderate equipment limitations that can be partly overcome by harvesting during dry seasons. Plant competition is severe, but competing vegetation can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is not suited to most building site development or to construction of sanitary facilities. Wetness and flooding are severe limitations. Low strength is a limitation for local roads and streets. These limitations are difficult to overcome.

This Chrysler soil is in capability subclass IIe and in woodland group 1w.

CnB—Congaree loam, 0 to 4 percent slopes, occasionally flooded. This deep, well drained soil is on terraces adjacent to the Alabama River and its larger tributaries. Slopes are smooth and slightly convex. The mapped areas are 30 to 200 acres.

Typically, the surface layer is brown loam about 6 inches thick. The underlying material extends to a depth of more than 60 inches. It is brown loam, silt loam, and fine sandy loam to a depth of 34 inches and dark yellowish brown, stratified loam, fine sandy loam, and silt loam and very pale brown fine sand to a depth of 65 inches.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid to neutral
Organic matter content: moderate
Natural fertility: moderate
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: at a depth of between 2-1/2 and 4 feet during winter and early in spring
Flooding frequency: occasional during winter and early in spring

Included with this soil in mapping are small areas of Mantachie and Urbo soils and soils similar to Congaree soil except they have a less clayey subsoil. These soils are contrasting soils, and their use and management differ from Congaree soil. They make up about 5 percent of the map unit.

This Congaree soil is used as woodland or for cultivated crops, hay, or pasture.

This soil is well suited to cultivated crops. Isolation caused by flooding of lower surrounding areas and the Alabama River is a limitation (fig. 3). The hazard of erosion is slight. This soil responds well to no-till and minimum tillage. When tilled, plowpans can form and restrict root growth of some annual crops. Tilth is best maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management; however, flooding can isolate animals.

Coniferous and deciduous trees are suited to this soil. Loblolly pine, slash pine, yellow-poplar, and American sycamore are recommended trees to plant. The hazard of flooding is the main limitation for woodland use and management. Planting and harvesting during the dry periods is necessary. Plant competition is moderate on this soil and can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is not suited to most types of building site development or to the construction of sanitary facilities. Flooding and wetness are severe limitations for most urban uses.

This Congaree soil is in capability subclass IIw and in woodland group 1o.

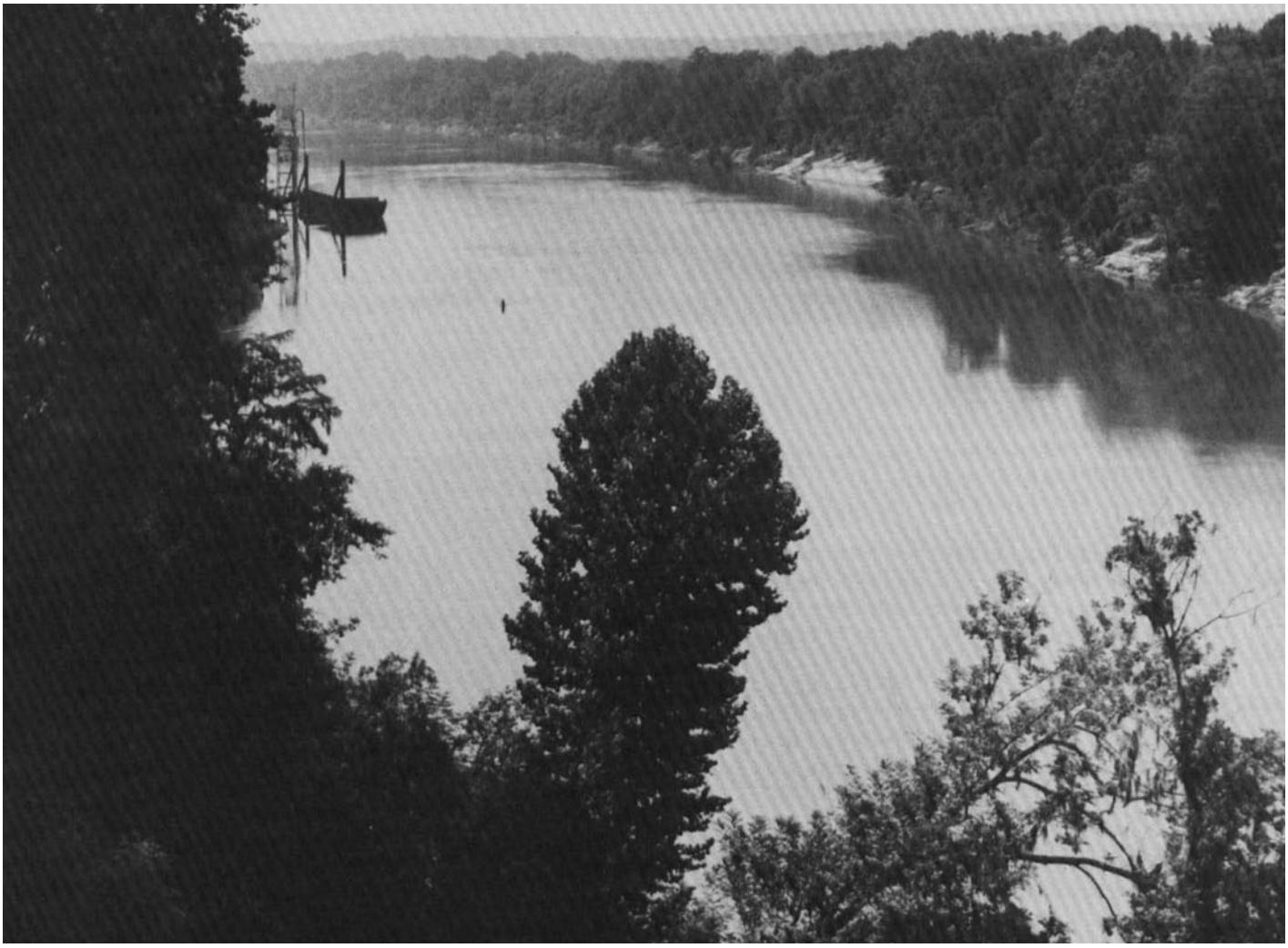


Figure 3.—The Alabama River provides many recreational and commercial opportunities in Monroe County, but it is often a barrier to easy access to Congaree loam, 0 to 4 percent slopes, occasionally flooded, in the background. The wooded area in the foreground is in an area of Saffell-Lucy complex, 15 to 35 percent slopes.

EcA—Escambia very fine sandy loam, 0 to 1 percent slopes. This deep, somewhat poorly drained soil is in upland depressional areas and on toe slopes in the southern part of the county. Slopes are smooth and concave. The mapped areas are 10 to 100 acres.

Typically, the surface layer is gray very fine sandy loam about 9 inches thick. The subsoil is pale brown fine sandy loam and yellowish brown loam to a depth of 28 inches; mottled strong brown, yellowish red, and light gray loam to a depth of 43 inches; and mottled gray, yellowish brown, and red clay loam that is 15 to 25 percent by volume plinthite to a depth of about 61 inches.

Important soil properties:

Permeability: slow or moderately slow
Available water capacity: medium
Soil reaction: very strongly acid or strongly acid
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches but restricted below a depth of about 30 inches
Water table: at a depth of between 1-1/2 and 2 feet during winter and early in spring
Flooding frequency: none

Included with this soil in mapping are a few small areas of Atmore, Bibb, Malbis, and Poarch soils. Also

included are soils similar to Escambia soil except they have a loamy sand surface layer. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres. Atmore and Bibb soils are contrasting soils, and their use and management differ from Escambia soil. The contrasting soils make up about 10 percent of the map unit.

This Escambia soil is used primarily for cultivated crops, pasture, or hay. Some large areas are used as woodland.

This soil is suited to cultivated crops. Wetness is the main limitation. The high water table can delay spring planting. Subsurface and surface drainage helps to lower the seasonal high water table. Recommended intervals for surface drains are 40 to 120 feet and for subsurface drains, 35 to 70 feet. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. Wetness is a significant concern in management. Deferred grazing during wet periods helps to prevent soil compaction by livestock.

Coniferous and deciduous trees are well suited to this soil. Loblolly pine, slash pine, and sweetgum are recommended trees to plant. The moderate equipment limitation because of wetness can be partly overcome by planting and harvesting during dry periods.

This soil is poorly suited to most building site development and to the construction of sanitary facilities. Wetness is a severe limitation for most urban uses. This limitation is difficult to overcome.

This Escambia soil is in capability subclass IIw and in woodland group 2w.

EsC—Esto sandy loam, 3 to 10 percent slopes. This deep, well drained soil is on ridges, knolls, and choppy side slopes in the southern part of the county. Slopes are complex and convex. The mapped areas are 8 to 40 acres.

Typically, the surface layer is brown sandy loam about 4 inches thick. The subsoil is strong brown clay loam to a depth of about 10 inches; yellowish red and mottled yellowish brown, red, light brownish gray, and weak red clay to a depth of about 50 inches; and brownish yellow clay to a depth of about 61 inches. The underlying material is mottled brownish yellow, light gray, red, and dusky red stratified sandy loam and sandy clay loam to a depth of about 78 inches.

Important soil properties:

Permeability: slow
Available water capacity: medium
Soil reaction: very strongly acid or strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Bama, Lucy, Malbis, and Saffell soils. Also included are soils similar to Esto soil except they have more than 15 percent by volume ironstone nodules in the subsoil. The included soils make up about 20 percent of the map unit, but individual areas are generally less than 2 acres. Bama, Lucy, and Saffell soils are contrasting soils, and their use and management differ from Esto soil. The contrasting soils make up about 15 percent of the map unit.

This Esto soil is used primarily as woodland. Some areas have been cleared and are used for cultivated crops, pasture, or hay.

This soil is poorly suited to cultivated crops. Slope and the severe hazard of erosion are limitations. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. Terraces help to control erosion, but the undulating shape of the surface in some areas makes construction difficult. Good tilth is hard to maintain. Returning crop residue to the soil and adding organic matter by a sod base rotation improve tilth.

This soil is suited to pasture and hay. Erosion and low natural fertility are significant concerns in management.

Coniferous trees are suited to this soil. Loblolly pine and slash pine are recommended trees to plant. There are no significant concerns in management.

This soil is suited to some building site development and to the construction of some sanitary facilities. Slow permeability is a severe limitation for septic tank absorption fields and is difficult to overcome. The clayey subsoil and shrinking and swelling are moderate limitations for most urban uses. Low strength is a limitation for local roads and streets. These limitations can generally be overcome by proper design.

This Esto soil is in capability subclass IVe and in woodland group 3o.

GdA—Grady loam, 0 to 2 percent slopes. This deep, poorly drained soil is in upland round depressional areas in the southern part of the county. Locally, areas of these soils are referred to as "Grady Ponds," or "Cypress Ponds." About 60 percent of this map unit is either drained or partially drained. The remainder is covered with water during winter and early in spring. The mapped areas are 3 to 40 acres.

Typically, the surface layer is dark grayish brown loam about 6 inches thick. The subsoil is gray clay loam and clay to a depth of about 62 inches.

Important soil properties:

Permeability: slow
Available water capacity: medium
Soil reaction: extremely acid to strongly acid
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches

Root zone: more than 60 inches
Water table: at, near, or above the surface during winter, spring, and early in summer
Flooding frequency: none

Included with this soil in mapping are a few areas of Atmore and Escambia soils. Also included are soils similar to Grady soil except they are more poorly drained or have less clay in the subsoil. The included soils make up about 25 percent of the map unit, but individual areas are generally less than 3 acres. Escambia soils are contrasting soils, and their use and management differ from Grady soil. The contrasting soils make up about 5 percent of the map unit.

This Grady soil is used as woodland and for hay, pasture, and cultivated crops.

This soil is poorly suited to cultivated crops because of ponding and wetness. Crops grown on this soil need to be tolerant of wetness. This soil is suited to pasture and hay. The seasonal high water table and ponding are limitations. Surface drainage helps to lower the seasonal high water table. Recommended intervals for surface drains are 40 to 120 feet, but outlets can be difficult to locate. Deferred grazing during wet periods helps to prevent soil compaction by livestock.

Deciduous trees are suited to this soil. American sycamore and water tupelo are recommended trees to plant. This soil has severe equipment limitations, seedling mortality, and plant competition. These limitations can be partly overcome by harvesting and planting during dry seasons, planting seedlings on beds or increasing the planting rate, and by site preparation to control plant competition.

This soil is poorly suited to most building site development and to the construction of sanitary facilities. Ponding and wetness are severe limitations that are difficult to overcome.

This Grady soil is in capability subclass Vw and in woodland group 4w.

GrB—Greenville sandy loam, 2 to 5 percent slopes. This deep, well drained soil is on broad ridges in the central and western part of the county. Slopes are long, smooth, and convex. The mapped areas are 10 to more than 100 acres.

Typically, the surface layer is dark reddish brown sandy loam about 6 inches thick. The subsoil is dark red clay loam to a depth of 13 inches and dark red clay to a depth of about 75 inches.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid to medium acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are a few small areas of Bama and Lucedale soils. Also included are soils similar to Greenville soil except they have a sandy clay loam or a clay loam surface layer. The included soils make up about 10 percent of the map unit, but individual areas are generally less than 3 acres.

This Greenville soil is used primarily for cultivated crops, pasture, or hay. Some areas are used as woodland.

This soil is well suited to cultivated crops (fig. 4). Slope and the moderate hazard of erosion are limitations. No-till, minimum tillage, terraces, contour farming, and the use of cover crops reduce runoff and help to control erosion. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. There are no significant concerns in management.

This soil is suited to most building site development and to the construction of sanitary facilities. Seepage and slope are moderate limitations for sewage lagoon areas, but these limitations can be overcome by proper design. Low strength is a moderate limitation for local roads and streets. Moderate permeability is a moderate limitation for septic tank absorption fields, but this limitation can be overcome by increasing the size of the absorption field.

This Greenville soil is in capability subclass IIe and in woodland group 3o.

GrC—Greenville sandy loam, 5 to 8 percent slopes. This deep, well drained soil is on broad ridges in the central and western part of the county. Slopes are long, smooth, and convex. The mapped areas are 8 to more than 40 acres.

Typically, the surface layer is dark reddish brown sandy loam about 6 inches thick. The subsoil is dark red clay loam to a depth of 13 inches and dark red clay to a depth of about 75 inches.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid to medium acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none
Flooding frequency: none

Figure 4.—Corn in an area of Greenville sandy loam, 2 to 5 percent slopes.

Included with this soil in mapping are a few small areas of Bama, Lucy, and Saffell soils. Also included are soils similar to Greenville soil except they have a sandy clay loam or a clay loam surface layer. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 3 acres. Lucy and Saffell soils are contrasting soils, and their use and management are different from Greenville soil. The contrasting soils make up about 5 percent of the map unit.

This Greenville soil is used primarily for cultivated crops, pasture, or hay. Some areas are used as woodland.

This soil is well suited to cultivated crops. Slope and the severe hazard of erosion are limitations. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. Terraces also help to control erosion, but the undulating shape of the surface in most areas makes construction difficult. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. There are no significant concerns in management.

This soil is suited to most types of building site development and to the construction of sanitary facilities. Seepage and slope are moderate limitations for sewage

lagoon areas, but these limitations can be overcome by proper design. Low strength is a moderate limitation for local roads and streets. Moderate permeability is a moderate limitation for septic tank absorption fields, but this limitation can be overcome by increasing the size of the absorption field.

This Greenville soil is in capability subclass IIIe and in woodland group 3o.

HaB—Halso sandy loam, 1 to 5 percent slopes. This deep, moderately well drained soil is on broad ridges in the northern part of the county. Slopes are smooth and convex. The mapped areas are 20 to 100 acres.

Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is dark red and yellowish red clay to a depth of 31 inches. The underlying material is mottled yellowish red, light olive gray, and yellowish brown clayey shale to a depth of 47 inches and mottled yellowish red, light brownish gray, and yellowish brown clayey shale bedrock to a depth of 60 inches.

Important soil properties:

Permeability: very slow
Available water capacity: medium
Soil reaction: extremely acid to strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: 40 to 60 inches
Root zone: 40 to 60 inches
Water table: none within a depth of 6 feet, but the soil is saturated during winter and early in spring
Flooding frequency: none

Included with this soil in mapping are small areas of Luverne soils. The included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres.

This Halso soil is used primarily as woodland. Some areas have been cleared and are used for pasture and hay.

This soil is poorly suited to cultivated crops. Slope and the moderate hazard of erosion are limitations. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. Terraces help to control erosion, but the undulating shape of the surface in some areas makes construction difficult. Good tilth is best maintained by returning crop residue to the soil.

This soil is suited to pasture and hay. The hazard of erosion is a concern in management.

Coniferous trees are well suited to this soil. Loblolly pine and slash pine are recommended trees to plant. The clayey subsoil is a moderate limitation for use of equipment. Harvesting operations need to be planned for when the soil is dry. Plant competition is severe, but it can be controlled by site preparation to eliminate unwanted vegetation.

This soil is not suited to most building site development nor to the construction of most sanitary facilities. The very slow permeability and depth to bedrock are severe limitations for septic tank absorption fields. Low strength is a severe limitation for local roads and streets. Shrinking and swelling, the clayey subsoil, and depth to shale material are severe limitations for most urban uses. These limitations are difficult to overcome.

This Halso soil is in capability IIIe and in woodland group 2c.

HaC—Halso sandy loam, 5 to 10 percent slopes. This moderately deep, moderately well drained soil is on broad ridges and side slopes in the northern part of the county. Slopes are smooth and convex. The mapped areas are 10 to 80 acres.

Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is red clay to a depth of 31 inches. The underlying material is mottled yellowish red, light olive gray, and yellowish brown clayey shale to a depth of 47 inches and mottled light brownish gray, yellowish red, and yellowish brown shale bedrock to a depth of 60 inches.

Important soil properties:

Permeability: very slow
Available water capacity: medium
Soil reaction: extremely acid to strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: 40 to 60 inches
Root zone: 40 to 60 inches
Water table: none within a depth of 6 feet, but the soil is saturated during winter and early in spring
Flooding frequency: none

Included with this soil in mapping are small areas of Luverne soils. The included soils make up about 10 percent of the map unit, but individual areas are generally less than 5 acres.

This Halso soil is used primarily as woodland. Some areas have been cleared and are used for pasture and hay.

This soil is poorly suited to cultivated crops. Slope and the severe hazard of erosion are limitations. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. Terraces help to control erosion, but the undulating shape of the surface in some areas makes construction difficult. Good tilth is best maintained by returning crop residue to the soil.

This soil is suited to pasture and hay. The hazard of erosion is a concern in management.

Coniferous trees are well suited to this soil. Loblolly pine and slash pine are recommended trees to plant. The clayey subsoil is a moderate limitation for use of

equipment. Equipment use on this soil needs to be planned for when the soil is dry. Plant competition is severe, but it can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is not suited to most building site development nor to the construction of most sanitary facilities. The very slow permeability and depth to bedrock are severe limitations for septic tank absorption fields. Low strength is a severe limitation for local roads and streets. Shrinking and swelling, the clayey suboil, and depth to shale material are severe limitations for most urban uses. These limitations are difficult to overcome.

This Halso soil is in capability IVe and in woodland group 2c.

ImA—Iuka and Mantachie soils, 0 to 2 percent slopes, frequently flooded. This undifferentiated group consists of deep, moderately well drained Iuka soil and deep, somewhat poorly drained Mantachie soil. These soils are on flood plains in the northern part of the county. Slopes are smooth and slightly convex or slightly concave. Some areas are made up of mostly Iuka soil, and some areas are made up of mostly Mantachie soil; however, most areas have both soils.

Iuka soil and similar soils make up about 70 percent of the map unit. Typically, the surface layer of the Iuka soil is light gray loamy sand about 5 inches thick. The underlying material is mottled, stratified sandy and loamy material to a depth of 66 inches. The similar soils are well drained.

Mantachie soil and similar soils make up about 20 percent of the map unit. Typically, the surface layer of the Mantachie soil is brown loam about 3 inches thick. The subsoil is clay loam. It is brown to a depth of about 10 inches, mottled in shades of brown and gray to a depth of about 33 inches, and is light gray to a depth of about 66 inches.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: Iuka soil—low, Mantachie soil—moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: Iuka soil—1 foot to 3 feet below the surface, Mantachie soil—1 foot to 1-1/2 feet below the surface during winter and early in spring
Flooding frequency: frequent

Included with these soils in mapping are areas of Bibb and Lenoir soils. Also included are areas of soils that are very poorly drained and in depressional areas. The included soils make up about 10 percent of the map unit, but individual areas are generally less than 10 acres. Bibb soils and the very poorly drained soils are contrasting soils, and their use and management differ from Iuka and Mantachie soils. The contrasting soils make up about 5 percent of the map unit.

The soils of this map unit are used primarily as woodland. Some areas have been cleared and are used for pasture or cultivated crops.

These soils are poorly suited to cultivated crops. The seasonal high water table and the hazard of flooding are limitations. Subsurface and surface drainage helps to lower the seasonal high water table. The recommended intervals for subsurface drains are 80 to 120 feet for Mantachie soil. Wetness of Iuka soil seldom interferes with cultivation of full-season crops. However, if Iuka soil is to be tilled during winter and early in spring, the seasonal high water table needs to be lowered by using subsurface or surface drainage. The recommended intervals for subsurface drains are 80 to 160 feet for Iuka soils. Crops grown on Mantachie soil need to be tolerant of wetness.

These soils are well suited to pasture and hay. Wetness can limit the use of equipment for fertilizing and harvesting. Deferred grazing during wet periods helps to prevent soil compaction by livestock.

Coniferous and deciduous trees are suited to these soils. Loblolly pine, eastern cottonwood, sweetgum, yellow-poplar, and green ash are recommended trees to plant. Because of a high water table and flooding, Iuka soil has moderate equipment limitations and seedling mortality and Mantachie soil has severe equipment limitations and seedling mortality. These limitations can be partly overcome by harvesting and planting during dry seasons. Plant competition is severe on these soils, but it can be controlled by site preparation to help eliminate unwanted vegetation.

These soils are not suited to most building site development or to construction of sanitary facilities. Wetness and the hazard of flooding are severe limitations and are difficult to overcome. Low strength is a limitation for local roads and streets.

Iuka and Mantachie soils are in capability subclass Vw and in woodland group 1w.

IrB—Izagora fine sandy loam, 0 to 4 percent slopes, occasionally flooded. This deep, moderately well drained soil is on stream terraces adjacent to the Alabama River and its larger tributaries. Slopes are smooth and slightly convex or slightly concave. The mapped areas are 10 to 100 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsurface layer is very pale brown fine sandy loam to a depth of about 12 inches. The subsoil is brownish yellow loam and clay loam to a depth of about 35 inches and yellowish brown clay to a depth of about 63 inches.

Important soil properties:

Permeability: moderate to slow
Available water capacity: medium
Soil reaction: extremely acid to strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: at a depth of between 2 and 3 feet during winter and early in spring
Flooding frequency: occasional during winter and early in spring

Included with this soil in mapping are areas of Chrysler and Malbis soils. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 10 acres. Malbis soils are contrasting soils, and their use and management differ from Izagora soil. The contrasting soils make up about 5 percent of the map unit.

This Izagora soil is used primarily as woodland. Some areas have been cleared and are used for pasture or cultivated crops.

This soil is suited to cultivated crops. The seasonal high water table and the hazard of flooding are limitations. Subsurface and surface drainage help to lower the seasonal high water table. Wetness seldom interferes with cultivation of full-season crops. However, if this soil is tilled during winter and early in spring, the seasonal high water table needs to be lowered by using subsurface or surface drainage. Recommended intervals for subsurface drains are 100 to 130 feet and for surface drains, 120 to 160 feet.

This soil is well suited to pasture and hay. Wetness can limit the use of equipment for fertilizing and harvesting. Deferred grazing during wet periods helps to prevent soil compaction by livestock.

Coniferous and deciduous trees are suited to this soil. Loblolly pine, slash pine, sweetgum, yellow-poplar, and water oak are recommended trees to plant. Izagora soil has moderate equipment limitations because of wetness. These limitations can be partly overcome by harvesting and planting during dry seasons. Plant competition is severe, but it can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is not suited to most building site development or to construction of sanitary facilities. Wetness and flooding are severe limitations. Low strength is a limitation for local roads and streets. These limitations are difficult to overcome.

This Izagora soil is in capability subclass IIw and in woodland group 2w.

LaA—Lenoir loam, 0 to 2 percent slopes, frequently flooded. This deep, somewhat poorly drained soil is on terraces of the Alabama River and its tributaries. The mapped areas are 10 to 100 acres.

Typically, the surface layer is grayish brown loam about 4 inches thick. The subsoil is yellowish brown clay loam to a depth of 9 inches, mottled light brownish gray, red, and yellowish brown clay loam to a depth of 23 inches, and gray clay to a depth of about 66 inches.

Important soil properties:

Permeability: slow
Available water capacity: medium
Soil reaction: extremely acid to strongly acid
Organic matter content: moderate
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: at a depth of between 1 foot and 2-1/2 feet during winter and early in spring
Flooding frequency: frequent during winter and early in spring

Included with this soil in mapping are a few areas of Chrysler and Izagora soils. Also included are soils similar to Lenoir soil except they are more poorly drained. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres. Izagora soils are contrasting soils, and their use and management differ from Lenoir soil. The contrasting soils make up about 5 percent of the map unit.

This Lenoir soil is used primarily as woodland.

This soil is poorly suited to cultivated crops because of the flooding frequency and wetness. Crops grown on this soil need to be tolerant of wetness.

This soil is suited to pasture and hay. The seasonal high water table and flooding are limitations. Subsurface and surface drainage help to lower the seasonal high water table. Recommended intervals for subsurface and surface drains are 60 to 120 feet. Deferred grazing during wet periods helps to prevent soil compaction by livestock.

Coniferous and deciduous trees are suited to this soil. Loblolly pine, slash pine, American Sycamore, and sweetgum are recommended trees to plant. Because of the high water table and flooding, this soil has severe equipment limitations and moderate seedling mortality. These limitations can be partly overcome by harvesting and planting during dry seasons. Plant competition is severe, but it can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is poorly suited to most building site development and to the construction of sanitary facilities. Flooding and wetness are severe limitations that are difficult to overcome.

This Lenoir soil is in capability subclass Vw and in woodland group 2w.

LcA—Lucedale loam, 0 to 1 percent slopes. This deep, well drained soil is on broad ridges in the central part of the county. Slopes are long, smooth, and slightly

convex or slightly concave. The mapped areas are 20 to more than 1,000 acres.

Typically, the surface layer is dark brown loam about 8 inches thick. The subsoil is reddish brown loam to a depth of 16 inches, dark red clay loam to a depth of about 42 inches, and dark red and red sandy clay loam to a depth of 68 inches.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid to strongly acid except where the surface layer has been limed
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are a few small areas of Bama, Malbis, and Poarch soils. Also included are soils similar to Lucedale soil except they have a thicker surface layer; they are moderately well drained; or they are sandy clay in the lower part of the subsoil. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres. Malbis and Poarch soils are contrasting soils, and their use and management differ from Lucedale soil. The contrasting soils make up about 5 percent of the map unit.

This Lucedale soil is used primarily for cultivated crops. Some areas are used as woodland.

This soil is well suited to cultivated crops (fig. 5). The hazard of erosion is slight. No-till, minimum tillage, terraces, contour farming, and the use of cover crops reduce runoff and help to control erosion. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. There are no significant concerns in management.

This soil is suited to most building site development and to the construction of sanitary facilities. Seepage is a moderate limitation for sewage lagoon areas, but this limitation can be overcome by proper design. Low strength is a moderate limitation for local roads and streets.

This Lucedale soil is in capability class I and in woodland group 2o.

LcB—Lucedale fine sandy loam, 1 to 5 percent slopes. This deep, nearly level to gently sloping soil is on ridges in the central part of the county. Slopes are long, smooth, and slightly convex or slightly concave. The mapped areas are 10 to 100 acres.

Typically, the surface layer is dark reddish brown fine sandy loam about 5 inches thick. The next layer is dark reddish brown loam to a depth of 9 inches. The subsoil is dark red clay loam to a depth of 66 inches and yellowish red sandy clay loam to a depth of about 80 inches.

Important soil properties:

Permeability: moderate
Available water capacity: medium
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are a few small areas of Bama and Saffell soils. Also included are soils similar to Lucedale soil except they have a loam or a sandy clay loam surface layer or they are sandy clay in the lower part of the subsoil. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres. Saffell soils are contrasting soils, and their use and management differ from Lucedale soil. The contrasting soils make up about 5 percent of the map unit.

This soil is used primarily for cultivated crops. Some areas are used as woodland or for pasture and hay.

This soil is well suited to cultivated crops. Slope and the moderate hazard of erosion are limitations. No-till, minimum tillage, terraces, contour farming, and the use of cover crops reduce runoff and help to control erosion. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. There are no significant concerns in management.

This soil is well suited to most building site development and to the construction of sanitary facilities. Seepage and slope are moderate limitations for sewage lagoon areas, but these limitations can be overcome by proper design.

This Lucedale soil is in capability subclass IIe and in woodland group 2o.

LnB—Lucy loamy sand, 1 to 5 percent slopes. This deep, well drained soil is on broad ridges throughout the county. Slopes are complex and convex. The mapped areas are 10 to more than 80 acres.

Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsurface layer is

Figure 5.—Soybeans in Lucedale loam, 0 to 1 percent slopes.

yellowish brown loamy sand to a depth of 25 inches. The subsoil is strong brown, yellowish red, and red sandy loam and sandy clay loam to a depth of 66 inches.

Important soil properties:

Permeability: rapid in the surface and subsurface layers and moderate in the subsoil
Available water capacity: low
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Bama, Malbis, and Saffell soils. Also included are areas of Lucy soils that have loamy sand less than 20 inches thick. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 10 acres. Bama, Malbis, and Saffell soils are contrasting soils, and their use and management differ from Lucy soil. The contrasting soils make up about 10 percent of the map unit.

This Lucy soil is primarily used as woodland. Some areas have been cleared and are used for cultivated crops, hay, or pasture.

This soil is suited to cultivated crops. The low available water capacity of the surface and subsurface layers is a limitation. The hazard of erosion is moderate, and this soil is subject to gully erosion in areas where

water is concentrated. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. If tilled, plowpans can form and restrict root growth of some annual crops. Tilth is best maintained by returning crop residue to the soil.

This soil is suited to pasture and hay. The low available water capacity of the surface and subsurface layers is a limitation, and deep-rooted plants, such as bahiagrass and bermudagrass, are best suited. Deferred grazing during dry periods helps keep the soil in good condition.

Coniferous trees are suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. Because of the sandy surface and subsurface layers, this soil has moderate equipment limitations, seedling mortality, and plant competition. The thick, sandy surface layer restricts equipment use in dry periods, so equipment use needs to be planned for periods when the soil is moist. The seedling mortality can be partly overcome by increasing the planting rate. Competition can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is suited to most building site development and to the construction of sanitary facilities. Seepage is a severe limitation for sewage lagoon areas and is difficult to overcome.

This Lucy soil is in capability subclass IIs and in woodland group 3s.

LnC—Lucy loamy sand, 5 to 8 percent slopes. This deep, well drained soil is on broad ridges and side slopes throughout the county. Slopes are complex and convex. The mapped areas are 10 to more than 160 acres.

Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of about 25 inches. The subsoil is strong brown, yellowish red, and red sandy loam and sandy clay loam to a depth of 66 inches.

Important soil properties:

Permeability: rapid in the surface and subsurface layers and moderate in the subsoil
Available water capacity: low
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Bama, Malbis, Saffell, and Troup soils. Also included are areas of Lucy soils that have loamy sand less than 20 inches thick. The included soils make up about 25 percent of the map unit, but individual areas are generally less than 10 acres. Bama, Malbis, and Saffell soils are contrasting soils, and their use and management differ from Lucy soil. The contrasting soils make up about 10 percent of the map unit.

This Lucy soil is primarily used as woodland. Some areas have been cleared and are used for cultivated crops, hay, or pasture.

This soil is poorly suited to cultivated crops. The low available water capacity of the surface and subsurface layer is a limitation. The hazard of erosion is moderate, and this soil is subject to gully erosion in areas where water is concentrated. If tilled, plowpans can form and restrict root growth of some annual crops. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. Tilth is best maintained by returning crop residue to the soil.

This soil is suited to pasture and hay. The low available water capacity of the surface and subsurface layers is a limitation, and deep-rooted plants, such as bahiagrass and bermudagrass, are best suited. Deferred grazing during dry periods helps keep the soil in good condition.

Coniferous trees are suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. Because of the sandy surface and subsurface layers, this soil has moderate equipment limitations, seedling mortality, and plant competition. The thick, sandy surface layer restricts equipment use in dry periods, so equipment use needs to be planned for periods when the soil is moist. The seedling mortality can be partly overcome by increasing the planting rate. Competition can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is suited to most building site development and to the construction of sanitary facilities. Seepage is a severe limitation for sewage lagoon areas and is difficult to overcome.

This Lucy soil is in capability subclass IIIs and in woodland group 3s.

LtE—Lucy-Troup loamy sands, 8 to 25 percent slopes. This map unit consists of deep, well drained, sandy and loamy soils on uplands in the central and southern parts of the county. The landscape is a series of convex side slopes that have narrow drains and narrow to broad ridgetops. Lucy soil is on mid to lower side slopes. Troup soil is on upper side slopes and ridges. The mapped areas of Lucy and Troup soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. The mapped areas range from 80 to more than 200 acres.

Lucy soil makes up about 45 percent of this map unit. Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of about 25 inches. The subsoil is strong brown and yellowish red

sandy loam to a depth of about 47 inches and red sandy clay loam to a depth of 92 inches.

Troup soil makes up about 35 percent of this map unit. Typically, the surface layer is brown loamy sand about 6 inches thick. The subsurface layer is yellowish brown, strong brown, and reddish yellow loamy sand to a depth of 54 inches. The subsoil is strong brown sandy loam to a depth of 60 inches and yellowish red sandy clay loam to a depth of 72 inches.

Important soil properties:

Permeability: rapid in the upper part of the soil and moderate in the lower part
Available water capacity: low
Soil reaction: very strongly acid or strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with these soils in mapping are areas of Bama soils on upper side slopes and ridges, soils on mid to lower side slopes and narrow ridges that are similar to Lucy and Troup soils but are clayey, and Bibb soils in drainageways. The included soils make up about 20 percent of the map unit.

The soils of this map unit are used primarily as woodland. A few small areas are used for cultivated crops and pasture.

These soils are poorly suited to cultivated crops because of the moderately steep slopes, the hazard of erosion, and the low available water capacity. Troup and Lucy soils are subject to gully erosion in areas where water is concentrated, and many active gullies in the county are in this map unit. No-till, minimum tillage, terraces, contour farming, and the use of cover crops reduce runoff and help to control erosion.

Lucy and Troup soils are suited to pasture and hay. Erosion is a hazard on slopes of more than 15 percent. The low available water capacity of both soils is a limitation, and deep-rooted plants, such as bahiagrass and bermudagrass, are best suited. Deferred grazing during dry periods helps keep the soil in good condition.

Coniferous trees are suited to these soils. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. Because of the sandy surface and subsurface layers, these soils have a moderate equipment limitation. Equipment use needs to be planned for when the soil is moist. Lucy and Troup soils have severe seedling mortality. The seedling mortality can be partly overcome by increasing the planting rate.

These soils are suited to most building site development and to the construction of sanitary facilities. Seepage is a severe limitation for sewage lagoon areas and for area sanitary landfills. Slope is a moderate to severe limitation for most urban uses, but this limitation can be overcome by proper design.

Lucy soils is in capability subclass VIs, and Troup soils is in capability subclass VIIs. They are in woodland group 3s.

LvC—Luverne sandy loam, 5 to 10 percent slopes. This deep, well drained soil is on ridges and side slopes in the northern part of the county. Slopes are complex and convex. The mapped areas are 20 to more than 500 acres.

Typically, the surface layer is brown sandy loam about 4 inches thick. The subsoil is yellowish red clay to a depth of about 26 inches. The underlying material is stratified yellowish red, gray, and yellowish brown sandy clay loam and sandy loam and stratified clayey shale and sandy material to a depth of about 72 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: moderate
Soil reaction: extremely acid to strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: restricted below a depth of 20 to 40 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Beatrice and Bama soils. The included soils make up about 25 percent of the map unit, but individual areas are generally less than 5 acres. Bama soils are contrasting soils, and their use and management differ from Luverne soil. The contrasting soils make up about 5 percent of the map unit.

This Luverne soil is used primarily as woodland. Some areas have been cleared and are used for cultivated crops, pasture, or hay.

This soil is poorly suited to cultivated crops, but moderate yields can be obtained. Slope and the moderate hazard of erosion are limitations. No-till, minimum tillage, contour farming, and use of cover crops reduce runoff and help to control erosion. Terraces help to control erosion, but the undulating shape of the surface in some areas makes construction difficult. Good tilth is best maintained by returning crop residue to the soil.

This soil is suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. The equipment limitation and plant competition are moderate on this soil. The clayey subsoil restricts the use of equipment when the soil is wet. Equipment use needs to be planned for when the soil is

dry. Plant competition can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is poorly suited to most building site development and to the construction of most sanitary facilities. The moderately slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. Low strength is a severe limitation for local roads and streets. Shrinking and swelling is a moderate limitation for most urban uses. These limitations can sometimes be overcome by proper design.

This Luverne soil is in capability subclass IVe and in woodland group 2c.

LvE—Luverne sandy loam, 10 to 25 percent slopes. This deep, well drained soil is on narrow ridges and side slopes in the northern part of the county. Slopes are complex and convex. The mapped areas are 100 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown sandy loam about 4 inches thick. The subsoil is yellowish red clay to a depth of 29 inches. The underlying material is mottled red, gray, and yellow sandy loam and clayey shale to a depth of 72 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: moderate
Soil reaction: extremely acid to strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: restricted below a depth of 20 to 40 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Beatrice, Halso, and Mantachie soils. Also included are soils similar to Luverne soil except they have a thinner subsoil. The included soils make up about 25 percent of the map unit, but individual areas are generally less than 10 acres. Mantachie soils are contrasting soils, and their use and management differ from Luverne soil. These soils are usually indicated by an intermittent or perennial stream symbol and make up about 5 percent of the map unit.

This Luverne soil is used primarily as woodland. Some areas have been cleared and are used for cultivated crops, pasture, or hay.

This soil is not suited to cultivated crops. Slope and the severe hazard of erosion are limitations. No-till, minimum tillage, contour farming, and the use of cover crops reduce runoff and help to control erosion. Terraces help to control erosion, but the undulating shape of the surface in most areas makes construction difficult.

This soil is suited to pasture and hay. However, slope and the hazard of erosion are significant concerns in management.

Coniferous trees are suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. The main concerns in management of timber on this soil are the moderate hazard of erosion, equipment use limitation, and plant competition. The clayey subsoil restricts the use of equipment when the soil is wet. To help control erosion, disturbed areas need to be revegetated as soon as possible after harvest. Plant competition can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is poorly suited to most building site development and to the construction of most sanitary facilities. Slope and moderately slow permeability are severe limitations for septic tank absorption fields. Low strength is a severe limitation for local roads and streets. Slope and shrinking and swelling are moderate to severe limitations for most urban uses. These limitations are difficult to overcome.

This Luverne soil is in capability subclass VIIe and in woodland group 2c.

MaA—Malbis loam, 0 to 1 percent slopes. This deep, moderately well drained soil is on upland flats in the southern and western parts of the county. Slopes are long, smooth, and slightly convex or slightly concave. The mapped areas are 10 to 800 acres.

Typically, the surface layer is very dark grayish brown loam about 9 inches thick. The subsoil is yellowish brown sandy clay loam to a depth of 19 inches, yellowish brown clay loam to a depth of about 43 inches, and mottled yellowish brown, yellowish red, and light gray clay loam that is 8 to 17 percent by volume plinthite to a depth of about 73 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: moderate
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches, but root penetration is restricted below a depth of about 40 inches
Water table: at a depth of between 2-1/2 and 4 feet during winter and early in spring
Flooding frequency: none

Included with this soil in mapping are a few small areas of Bama and Poarch soils. Also included are soils similar to Malbis soil except they are somewhat poorly drained. The included soils make up about 20 percent of the map unit, but individual areas are generally less than 5 acres. Bama soils and the somewhat poorly drained

soils are contrasting soils, and their use and management differ from Malbis soil. The contrasting soils make up about 10 percent of the map unit.

This Malbis soil is used primarily for cultivated crops. Some areas are used as woodland.

This soil is well suited to cultivated crops. This soil is well suited to no-till, minimum tillage, and to the use of cover crops. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. The main concern in management of timber on this soil is moderate plant competition. Plant competition reduces growth and adequate reforestation of desirable plants. Competition can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is suited to most building site development and to the construction of sanitary facilities. Low strength is a moderate limitation for local roads and streets. Wetness and the moderately slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Wetness is a moderate limitation for most urban uses.

This Malbis soil is in capability class I and in woodland group 2o.

MaB—Malbis fine sandy loam, 1 to 5 percent slopes. This deep, nearly level to gently sloping soil is on ridges and toe slopes in the southern and western parts of the county. Slopes are long, smooth, and slightly convex or slightly concave. The mapped areas are 5 to 60 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The subsoil is yellowish brown loam to a depth of 28 inches, yellowish brown sandy clay loam to a depth of about 37 inches. It is mottled brown, red, and gray sandy clay loam and clay loam that are 15 percent by volume plinthite to a depth of about 72 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: moderate
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches, but root penetration is restricted below a depth of about 40 inches
Water table: at a depth of between 2-1/2 and 4 feet during winter and early in spring
Flooding frequency: none

Included with this soil in mapping are a few small areas of Bama, Benndale, and Poarch soils. Also included are soils similar to Malbis soil except they have a clayey subsoil. The included soils make up about 25 percent of the map unit, but individual areas are generally less than 5 acres. Bama soils and the soils that have a clayey subsoil are contrasting soils, and their use and management differ from Malbis soil. The contrasting soils make up about 10 percent of the map unit.

This Malbis soil is used primarily for cultivated crops, pasture, or hay. Some areas are used as woodland.

This soil is well suited to cultivated crops. Slope and the moderate hazard of erosion are limitations. No-till, minimum tillage, terraces, contour farming, and the use of cover crops reduce runoff and help to control erosion. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay (fig. 6). There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. The main concern in management of timber on this soil is moderate plant competition. Plant competition reduces growth and adequate reforestation of desirable plants. Competition can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is suited to most building site development and to the construction of sanitary facilities. Low strength is a moderate limitation for local roads and streets. Wetness and the moderately slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Wetness is a moderate limitation for most urban uses.

This Malbis soil is in capability subclass IIe and in woodland group 2o.

MaC—Malbis fine sandy loam, 5 to 8 percent slopes. This deep, sloping soil is on ridges and side slopes in the southern and western parts of the county. Slopes are long, smooth, and slightly convex or slightly concave. The mapped areas are 10 to more than 40 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The subsoil is yellowish brown loam to a depth of 28 inches, yellowish brown sandy clay loam to a depth of 37 inches, and mottled brown, red, and gray sandy clay loam and clay loam that are 15 percent by volume plinthite to a depth of about 72 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: moderate
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches

Figure 6.—Mixed bahiagrass, bermudagrass, and dallisgrass pasture on Malbis fine sandy loam, 1 to 5 percent slopes.

Root zone: more than 60 inches, but root penetration is restricted below a depth of about 40 inches
Water table: at a depth of between 2-1/2 and 4 feet during winter and early in spring
Flooding frequency: none

Included with this soil in mapping are a few small areas of Bama, Esto, and Poarch soils. Also included are soils similar to Malbis soil except they have a clayey subsoil. The included soils make up about 25 percent of the map unit, but individual areas are generally less than 5 acres. Bama soils, the clayey subsoil soils, and Esto soils are contrasting soils, and their use and management differ from Malbis soil. The contrasting soils make up about 10 percent of the map unit.

This Malbis soil is used primarily for cultivated crops, pasture, or hay. Some areas are used as woodland.

This soil is suited to cultivated crops. Slope and the moderate to severe hazard of erosion are limitations. No-till, minimum tillage, terraces, contour farming, and the use of cover crops reduce runoff and help to control erosion. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. The main concern in management of timber on this soil is moderate plant competition. Plant competition reduces growth and adequate reforestation of desirable plants. Competition can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is suited to most building site development and to the construction of sanitary facilities. Low strength is a moderate limitation for local roads and streets. Wetness and the moderately slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Wetness is a moderate limitation for most urban uses.

This Malbis soil is in capability subclass IIIe and in woodland group 2o.

PoA—Poarch very fine sandy loam, 0 to 1 percent slopes. This deep, moderately well drained soil is in upland depressional areas and on toe slopes in the southern part of the county. Slopes are smooth and convex. The mapped areas are 10 to 100 acres.

Typically, the surface layer is dark gray very fine sandy loam about 4 inches thick. The next layer is light yellowish brown loam to a depth of 11 inches. The subsoil is yellowish brown loam and clay loam to a depth of 53 inches and mottled yellowish brown, reddish brown, and gray clay loam that is 10 percent by volume plinthite to a depth of about 72 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: moderate
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches, but root penetration is restricted below a depth of about 40 inches
Water table: at a depth of between 2-1/2 and 4 feet during winter and early in spring
Flooding frequency: none

Included with this soil in mapping are a few small areas of Benndale, Escambia, and Malbis soils. Also included are soils similar to Poarch soil except they have a loamy sand surface layer. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres. Benndale and the loamy sand surface layered soils are contrasting soils, and their use and management differ from Poarch soil. The contrasting soils make up about 5 percent of the map unit.

This Poarch soil is used primarily for cultivated crops, pasture, or hay. Some areas are used as woodland.

This soil is well suited to cultivated crops. It is well suited to no-till, minimum tillage, and to the use of cover crops. The high water table can delay spring planting. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. There are no significant concerns in management.

Coniferous trees are well suited to this soil. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. The main concern in management of timber on this soil is moderate plant competition. Plant competion reduces growth and adequate reforestation of desirable plants. Competition can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is suited to most building site development and to the construction of sanitary facilities. Seepage is a moderate limitation for sewage lagoon areas, but this limitation can be overcome by proper design. Wetness and moderately slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult to overcome. Wetness is a moderate limitation for most urban uses.

This Poarch soil is in capability class I and in woodland group 2o.

PrD—Prim very cobbly loam, 4 to 15 percent slopes. This shallow, well drained soil is on narrow upland ridges and side slopes in the western part of the county near Perdue Hill. Small areas of limestone rock outcrop are common. Slopes are complex and convex. The mapped areas are 50 to more than 200 acres.

Typically, the surface layer is very dark grayish brown very cobbly loam about 9 inches thick. The underlying material is soft, fragmented limestone bedrock to a depth of 60 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: very low
Soil reaction: neutral to moderately alkaline
Organic matter content: moderate
Natural fertility: moderate
Depth to bedrock: 4 to 20 inches
Root zone: 4 to 20 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of soils that have a yellow or red subsoil. Also included are areas of soils similar to Prim soil except they have less than 20 percent cobbles. The included soils make up about 25 percent of the map unit, but individual areas are less than 10 acres. The soils that have a yellow or red subsoil are contrasting soils, and their use and management differ from Prim soil. The contrasting soils make up about 10 percent of the map unit.

This Prim soil is used as woodland. Some areas are used as a source of agricultural lime.

This soil is not suited to cultivated crops. Slope, the cobble content, and the severe hazard of erosion are limitations.

This soil is poorly suited to pasture and hay. The severe hazard of erosion is a concern in management. Cobbles and limestone rock outcrop limit pasture mowing for weed and brush control and forage cutting.

Coniferous trees are suited to this soil. Eastern redcedar is a recommended tree to plant. This soil has severe equipment limitations because of the cobble content, depth to rock, and limestone rock outcrop. These limitations are difficult to overcome. This soil has moderate seedling mortality that can be partly overcome by increasing the planting rate.

This soil is not suited to most building site development nor to the construction of most sanitary facilities. Depth to rock and the cobble content are

severe limitations. These limitations are very difficult to overcome.

This Prim soil is in capability subclass VIs and in woodland group 3d.

SfC—Saffell very gravelly sandy loam, 5 to 8 percent slopes. This deep, well drained soil is on ridges and side slopes throughout the county. Slopes are complex and convex. The mapped areas are 10 to more than 60 acres.

Typically, the surface layer is dark grayish brown very gravelly sandy loam about 3 inches thick. The next layer is brown gravelly sandy loam to a depth of 10 inches. The subsoil is yellowish red and red very gravelly sandy loam and very gravelly sandy clay loam to a depth of about 40 inches. The underlying material is yellowish red stratified very gravelly loamy sand, very gravelly sandy loam, and very gravelly sand to a depth of about 60 inches.

Important soil properties:

Permeability: moderate
Available water capacity: low
Soil reaction: very strongly acid or strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: restricted below a depth of about 40 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Bama and Lucy soils. Also included are soils that have less clay content than Saffell soil. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres. Bama soils are contrasting soils, and their use and management differ from Saffell soil. The contrasting soils make up about 5 percent of the map unit.

This soil is used primarily as woodland. Some areas have been cleared and are used for cultivated crops, pasture, or hay.

This soil is fairly well suited to poorly suited to cultivated crops, but moderate yields can be obtained. Slope, the moderate hazard of erosion, and the gravel content are limitations. No-till, minimum tillage, contour farming, and use of cover crops reduce runoff and help to control erosion. Terraces help to control erosion, but the undulating shape of the surface in some areas makes construction difficult. Good tilth is best maintained by returning crop residue to the soil.

This soil is fairly well suited to pasture and hay. The low available water capacity and the gravel content are limitations. Deep-rooted plants, such as bahiagrass and bermudagrass, are best suited. Deferred grazing during dry periods helps keep the soil in good condition.

Coniferous trees are suited to this soil, but potential productivity is moderately low. Loblolly pine is a recommended tree to plant. The low available water capacity and the gravel content can cause moderate seedling mortality. Increasing the planting rate will partly overcome the seedling mortality limitation.

The soil is suited to most building site development and to the construction of most sanitary facilities. The moderate permeability is a moderate limitation for septic tank absorption fields, but this limitation can be overcome by increasing the size of the absorption field. Seepage is a severe limitation for most sanitary facilities. Building site development is limited by the low available water capacity.

This Saffell soil is in capability subclass IIIe and in woodland group 4f.

SfD—Saffell very gravelly sandy loam, 8 to 15 percent slopes. This deep, well drained soil is on side slopes throughout the county. Slopes are complex and convex. The mapped areas are 10 to more than 200 acres.

Typically, the surface layer is dark grayish brown very gravelly sandy loam about 3 inches thick. The next layer is brown gravelly sandy loam to a depth of 10 inches. The subsoil is yellowish red and red very gravelly sandy loam and very gravelly sandy clay loam to a depth of about 40 inches. The underlying material is yellowish red stratified very gravelly loamy and sandy material to a depth of about 60 inches.

Important soil properties:

Permeability: moderate
Available water capacity: low
Soil reaction: very strongly acid or strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: restricted below a depth of about 40 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this soil in mapping are small areas of Bama and Lucy soils. Also included are soils that have less clay content or more clay content than Saffell soil. The included soils make up about 25 percent of the map unit, but individual areas are generally less than 5 acres. Bama soils and the soils that are more or less clayey are contrasting soils, and their use and management differ from Saffell soil. The contrasting soils make up about 10 percent of the map unit.

This Saffell soil is used primarily as woodland. Some areas have been cleared and are used for cultivated crops, pasture, or hay.

This soil is poorly suited to cultivated crops. Slope, the severe hazard of erosion, and the gravel content are limitations. No-till, minimum tillage, contour farming, and use of cover crops reduce runoff and help to control erosion. Terraces help to control erosion, but the

undulating shape of the surface in some areas makes construction difficult. Good tilth is best maintained by returning crop residue to the soil.

This soil is fairly well suited to pasture and hay. The low available water capacity and the gravel content are limitations. Deep-rooted plants, such as bahiagrass and bermudagrass, are best suited. Deferred grazing during dry periods helps keep the soil in good condition.

Coniferous trees are suited to this soil, but potential productivity is moderately low. Loblolly pine is a recommended tree to plant. The low available water capacity and the gravel content can cause moderate seedling mortality. This can be partly overcome by increasing the tree planting rate.

This soil is suited to most building site development and to the construction of most sanitary facilities. The moderate permeability is a moderate limitation for septic tank absorption fields, but this limitation can be overcome by increasing the size of the absorption field. Seepage is a severe limitation for most sanitary facilities. Building site development is limited by the low available water capacity.

This Saffell soil is in capability subclass IVe and in woodland group 4f.

SgF—Saffell-Lucy complex, 15 to 35 percent slopes. This map unit consists of deep, well drained, gravelly and sandy soils on uplands in the central and southern parts of the county. The landscape is a series of convex side slopes that have narrow drains and narrow to broad ridgetops. Saffell soil is on upper side slopes and ridges. Lucy soil is on mid to lower side slopes. Areas of Saffell and Lucy soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. The mapped areas range from 80 to more than 2,000 acres.

Saffell soil makes up about 60 percent of this map unit. Typically, the surface layer is dark grayish brown very gravelly sandy loam about 3 inches thick. The subsurface layer is brown gravelly sandy loam to a depth of 10 inches. The subsoil is yellowish red very gravelly sandy loam to a depth of 14 inches and red very gravelly sandy clay loam to a depth of 40 inches. The underlying material is yellowish red, stratified, very gravelly loamy and sandy material to a depth of 60 inches.

Lucy soil makes up about 20 percent of this map unit. Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of about 25 inches. The subsoil is strong brown and yellowish red sandy loam and sandy clay loam to a depth of about 47 inches and red sandy clay loam to a depth of 66 inches.

Important soil properties:

Permeability: moderate
Available water capacity: low
Soil reaction: very strongly acid or strongly acid
Organic matter content: low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: none within a depth of 6 feet
Flooding frequency: none

Included with this complex in mapping are areas of Bama soils on upper side slopes and ridges, Esto soils on mid to lower side slopes and narrow ridges, and Bibb soils in drainageways. The included soils make up about 20 percent of the map unit.

The soils of this complex are used primarily as woodland. A few small areas are used for pasture.

These soils are not suited to cultivated crops because of steepness of slopes, the severe hazard of erosion, and the low available water capacity. Lucy soil is subject to gully erosion in areas where water is concentrated, and many active gullies in the county are in this map unit.

Saffell and Lucy soils are poorly suited to pasture and hay. Erosion is a severe hazard. The low available water capacity is a limitation, and deep-rooted plants, such as bahiagrass and bermudagrass, are best suited.

Coniferous trees are suited to these soils. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. The main concern in management of timber on this soil is the moderate equipment limitations. The sandy surface layer of Lucy soil and the gravelly surface layer of Saffell soil restrict the use of equipment. Equipment use needs to be planned for when the soil is moist. Lucy soil has severe seedling mortality, and Saffell soil has moderate seedling mortality. This can be partly overcome by increasing the planting rate. Conservation practices on disturbed areas of the soils in this map unit help to control the moderate hazard of erosion. Plant competition can be controlled by site preparation to help eliminate unwanted vegetation.

These soils are suited to most building site development and to the construction of sanitary facilities. Seepage is a severe limitation for sewage lagoon areas and area type sanitary landfills. Slope is a severe limitation for most urban uses. This limitation is difficult to overcome.

This Saffell soil is in capability subclass VIIe and in woodland group 4f. Lucy soil is in capability subclass VIIs and in woodland group 3s.

SmA—Smithton sandy loam, 0 to 1 percent slopes, occasionally flooded. This deep, poorly drained soil is on flood plains adjacent to the Alabama River and its tributaries. Slopes are smooth and convex. The mapped areas are 40 to 120 acres.

Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsoil is gray sandy loam to a depth of 42 inches and mottled gray

and yellowish brown sandy clay loam and clay loam to a depth of 72 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: medium
Soil reaction: very strongly acid or strongly acid
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: at or near the surface during winter and early in spring
Flooding frequency: occasional during winter and early in spring

Included with this soil in mapping are a few small areas of Bibb and Stough soils. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 3 acres.

This Smithton soil is used primarily as woodland. Some areas are used for pasture.

This soil is poorly suited to cultivated crops because of wetness and the hazard of flooding. Crops grown on this soil need to be tolerant of wetness.

This soil is suited to pasture and hay. The seasonal high water table is a limitation. Subsurface and surface drainage help to lower the seasonal high water table. The recommended intervals for surface and subsurface drains are 80 to 120 feet, but outlets can be difficult to locate. Deferred grazing during wet periods helps to prevent soil compaction by livestock.

Coniferous and deciduous trees are suited to this soil. Loblolly pine, slash pine, and sweetgum are recommended trees to plant. The main concerns in management of timber on this soil are the severe equipment limitations and seedling mortality and the moderate plant competition caused by the high water table and flooding. Harvesting and planting need to be planned during dry seasons. To reduce the seedling mortality rate, trees can be planted on beds or the planting rate can be increased. Competition from undesirable plants that prevent adequate reforestation of desirable plants can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is poorly suited to most building site development and to the construction of sanitary facilities. Wetness and the hazard of flooding are severe limitations that are difficult to overcome.

This Smithton soil is in capability subclass IVw and in woodland group 2w.

StA—Stough sandy loam, 0 to 1 percent slopes. This deep, somewhat poorly drained soil is on terraces of the Alabama River and its larger tributaries. Slopes are smooth and concave. The mapped areas are 20 to 640 acres.

Typically, the surface layer is very dark gray sandy loam about 6 inches thick. The next layer is pale brown sandy loam to a depth of 10 inches. The subsoil is light yellowish brown and light brownish gray sandy loam to a depth of 32 inches and mottled light yellowish brown, light red, light gray, and brownish yellow sandy clay loam that is 45 and 50 percent by volume compact and brittle to a depth of about 67 inches.

Important soil properties:

Permeability: moderately slow
Available water capacity: medium
Soil reaction: very strongly acid or strongly acid except where the surface layer has been limed
Organic matter content: moderately low
Natural fertility: low
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches but restricted below a depth of about 30 inches
Water table: at a depth of between 1 foot to 1-1/2 feet during winter and early in spring
Flooding frequency: none

Included with this soil in mapping are a few small areas of Bibb, Lenoir, and Smithton soils. Also included are soils similar to Stough soil except they have a loamy sand surface layer. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 5 acres. Bibb and Smithton soils are contrasting soils, and their use and management differ from Stough soils. The contrasting soils make up about 10 percent of the map unit.

This Stough soil is used primarily as woodland. Some areas have been cleared and are used for cultivated crops, pasture, or hay.

This soil is fairly well suited to cultivated crops. Wetness is the main limitation. The high water table can delay spring planting. Subsurface and surface drainage help to lower the seasonal high water table. Recommended intervals for surface drains are 40 to 120 feet and for subsurface drains, 35 to 70 feet. Good tilth is easily maintained by returning crop residue to the soil.

This soil is well suited to pasture and hay. Wetness is a significant concern in management. Deferred grazing during wet periods helps to prevent soil compaction by livestock.

Coniferous and deciduous trees are well suited to this soil. Loblolly pine, slash pine, and sweetgum are recommended trees to plant. The main concerns in management of timber on this soil are the moderate equipment use limitation and plant competition. The equipment use limitation caused by wetness and the high water table can be partly overcome by planting and harvesting during dry periods. Competition from undesirable plants that prevent adequate reforestation of desirable plants can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is poorly suited to most types of building site development and to the construction of sanitary facilities. Wetness is a severe limitation for most urban uses. This limitation is difficult to overcome.

This Stough soil is in capability subclass IIw and in woodland group 2w.

UdC—Udorthents, loamy, 0 to 8 percent slopes. This deep, moderately well drained, nearly level to sloping soil is on uplands in the Coastal Plain part of the county. Slopes are smooth and slightly concave to slightly convex. The mapped areas are rectangular and range from 3 to 15 acres.

Udorthents, loamy, is open excavations from which soils has been removed exposing other soil material. This Udorthent is the soil material left after Lucy, Saffell, Smithdale, and Troup soils have been removed for fill material.

Typically, the soil is stratified red, brown, and gray gravelly loamy sand, gravelly sandy loam, and gravelly sandy clay loam to a depth of 60 inches or more.

Important soil properties:

Permeability: moderate or moderately slow
Available water capacity: low
Soil reaction: extremely acid to strongly acid
Organic matter content: very low
Natural fertility: very low
Depth of bedrock: more than 60 inches
Root zone: restricted in all layers
Water table: none within a depth of 6 feet except for a few days following heavy rains during winter and early in spring
Flooding frequency: none

Included in mapping are a few areas of Troup, Luverne, and Saffell soils. Also included are high wall areas and areas of water. The contrasting soils and areas make up about 15 percent of the map unit. Their use and management differ from Udorthents, loamy, soil.

This Udorthents, loamy, is primarily not used. Some areas have been planted to loblolly pine.

This soil is not suited to cultivated crops. The low available water content, very low organic matter content and natural fertility, and the acid soil reaction are the main limitations. If this soil is cultivated, addition of lime and fertilizer need to be based on the results of soil tests. The Cooperative Extension Service can help determine the kinds and amounts of fertilizer and lime to apply.

This soil is poorly suited to pasture and hay. The low available water capacity, the very low organic matter content and natural fertility, and the acid soil reaction are limitations. Deep-rooted plants, such as bahiagrass, are best suited to this soil. Plant nutrients are readily leached from the root zone. Plants respond to frequent, light applications of lime and fertilizer.

Coniferous trees are suited to this soil; however, the potential productivity is low. Loblolly pine is a recommended tree to plant. This soil has moderate erosion hazard and seedling mortality. Conservation practices to control erosion are needed. Seedling mortality is caused by droughtiness, but it can be partly overcome by increasing the planting rate. Planted trees respond well to applications of lime and fertilizer.

This soil is suited to use for building site development and sanitary facilities. The moderate or moderately slow permeability is a severe limitation for septic tank absorption fields. Droughtiness is a moderate limitation for lawns, landscaping, and golf fairways.

Udorthents, loamy, is in capability subclass VIs and in woodland group 5s.

UnA—Una silty clay loam, 0 to 1 percent slopes, ponded. This deep, poorly drained soil is in depressions and sloughs of the Alabama River flood plains. The mapped areas are 10 to 160 acres.

Typically, the surface layer is gray silty clay loam about 2 inches thick. The subsoil is gray and light gray silty clay loam and silty clay to a depth of 72 inches or more.

Important soil properties:

Permeability: very slow
Available water capacity: high
Soil reaction: very strongly acid or strongly acid
Organic matter content: moderately low
Natural fertility: low to medium
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: above or near the surface throughout the year
Flooding frequency: frequent

Included with this soil in mapping are a few areas of Urbo soils. The included soils make up about 5 percent of the map unit, but individual areas are generally less than 3 acres.

This Una soil is used as woodland.

This soil is not suited to cultivated crops, pasture, or hay. Ponding, the hazard of frequent flooding, and wetness are the main limitations.

Deciduous trees are suited to this soil. Baldcypress, water tupelo, and swamp tupelo grow on this soil. The main concerns in management of timber on this soil are severe equipment limitations and seedling mortality caused by the high water table, ponding, and flooding. Management activities need to be planned for when the soil is dry. Trees can be planted on beds or the planting rate can be increased to partly overcome seedling mortality. Competition from undesirable plants that prevent adequate reforestation of desirable plants can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is poorly suited to most building site development and to construction of sanitary facilities. Flooding, ponding, and wetness are severe limitations that are difficult to overcome.

This Una soil is in capability subclass VIIw and in woodland group 3w.

UrA—Urbo silty clay loam, 0 to 1 percent slopes, frequently flooded. This deep, somewhat poorly drained soil is on flood plains of the Alabama River. The mapped areas are 40 to more than 200 acres.

Typically, the surface layer is dark brown and brown silty clay loam about 6 inches thick. The subsoil is brown silty clay loam to a depth of 16 inches; mottled brown, light brownish gray, and light gray silty clay to a depth of 25 inches; and light gray silty clay to a depth of 66 inches.

Important soil properties:

Permeability: very slow
Available water capacity: high
Soil reaction: very strongly acid or strongly acid
Organic matter content: moderately low
Natural fertility: low to medium
Depth to bedrock: more than 60 inches
Root zone: more than 60 inches
Water table: near the surface during winter and early in spring
Flooding frequency: frequent during winter and early in spring

Included with this soil in mapping are a few areas of Una soils and soils similar to Urbo soil except they are better drained. The included soils make up about 10 percent of the map unit, but individual areas are generally less than 3 acres.

This Urbo soil is used primarily as woodland.

This soil is poorly suited to cultivated crops, pasture, and hay. Wetness and the hazard of frequent flooding are the main limitations.

Deciduous trees are suited to this soil. Sweetgum and water oak are recommended trees to plant. The main concerns in management of timber on this soil are severe equipment limitations, seedling mortality, and moderate plant competition caused by flooding and the high water table. Management activities need to be planned for when the soil is dry. Trees can be planted on beds or the planting rate can be increased to partly overcome seedling mortality. Competition from undesirable plants that prevent adequate reforestation of desired plants can be controlled by site preparation to help eliminate unwanted vegetation.

This soil is poorly suited to most building site development and to the construction of sanitary facilities. Flooding and wetness are severe limitations that are difficult to overcome.

This Urbo soil is in capability subclass IVw and in woodland group 1w.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Monroe County are listed.

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. The acreage of high-quality farmland is limited, and 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 soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, feed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. The moisture supply, of course, must be adequate, and the growing season has to be sufficiently long. Prime farmland soils produce the highest yields with minimal inputs of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up 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, water control structures and spillways, or shooting ranges.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 6 percent.

About 179,530 acres or about 26 percent of the soils in Monroe County meets the requirements for prime farmland. Areas of these soils are scattered throughout the county, mainly on the Citronelle Formation and on terraces of the Alabama River and its tributaries. Most of the prime farmland is in general soil map units 1 and 2.

A recent trend in land use in some parts of the county is the loss of some prime farmland to industrial and urban uses. This loss results in more intensive use of marginal lands, which generally are more erodible, droughty, difficult to cultivate, and less productive.

The following map units, or soils, make up prime farmland in Monroe County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 5. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Soils that have limitations, such as a high water table or flooding, may qualify as prime farmland if these limitations are overcome by such measures as drainage or flood control. In the following list, the measures needed to overcome the limitations of a map unit, if any, are shown in parentheses after the map unit name. Onsite evaluation is necessary to determine if the corrective measures have overcome the limitations.

- Bab Bama sandy loam, 1 to 5 percent slopes
- BnB Benndale sandy loam, 1 to 5 percent slopes
- CaA Cahaba sandy loam, 0 to 2 percent slopes, occasionally flooded
- ChB Chrysler silt loam, 0 to 5 percent slopes, occasionally flooded
- CnB Congaree loam, 0 to 4 percent slopes, occasionally flooded
- EcA Escambia very fine sandy loam, 0 to 1 percent slopes
- GrB Greenville sandy loam, 2 to 5 percent slopes
- GrC Greenville sandy loam, 5 to 8 percent slopes
- IrB Izagora fine sandy loam, 0 to 4 percent slopes, occasionally flooded
- LcA Lucedale loam, 0 to 1 percent slopes
- LcB Lucedale fine sandy loam, 1 to 5 percent slopes
- MaA Malbis loam, 0 to 1 percent slopes
- MaB Malbis fine sandy loam, 1 to 5 percent slopes
- MaC Malbis fine sandy loam, 5 to 8 percent slopes
- PoA Poarch very fine sandy loam, 0 to 1 percent slopes

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern 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 bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Kenneth M. Rogers, conservation agronomist, Soil Conservation Service, helped to 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.

In 1982, about 26,600 acres of soybeans, 15,500 acres of corn, 5,300 acres of wheat, and 5,700 acres of cotton (fig. 7) were planted in Monroe County, and 2,500 acres of hay was harvested *(10)*. About 60,000 acres of pastureland is in the county.

The potential of the soils in Monroe County for increased production of food and fiber is good. About 50,000 acres of potentially good cropland is being used as pastureland and woodland. Yields could be increased on land currently being cultivated if the most recent technology were applied. This soil survey can help land users make sound land management decisions and can facilitate the application of crop production technology.

Soil erosion is a major concern on about a third of the cropland and a fourth of the pastureland in Monroe County. Soils that have slopes of more than 2 percent generally have the highest potential hazard of erosion. Bama, Lucedale, Malbis, and Greenville soils have slopes of 2 percent or more and are presently being cultivated.

Loss of soil through erosion is damaging in several ways. 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, such as Greenville soils, that have a clayey subsoil and on soils, such as Malbis soils, that have plinthite in the subsoil that restricts the rooting depth. Soil erosion results in sedimentation that causes offsite damage. controlling erosion on farmland minimizes the pollution of streams by sediment and improves the quality of water for municipal use, recreation, and fish and wildlife.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps plant cover and crop residue on the surface for extended periods can hold soil losses to amounts that do not reduce the productivity capacity of the soils. On livestock farms, legume and grass forage crops can be incorporated into the cropping system to

Figure 7.—Cotton in an area of Malbis loam, 0 to 1 percent slopes.

reduce erosion on sloping areas. These crops also provide nitrogen and improve tilth for the crops that follow in the rotation.

Conservation tillage and leaving crop residue on the surface help to increase water filtration and reduce the hazards of runoff and erosion. No-tillage production for corn, soybeans, and other crops is effective in reducing erosion on sloping areas. These practices can be adapted to most soils in the survey area.

Terraces and diversions control runoff and reduce erosion. They are most practical on deep, well drained and moderately well drained, sloping soils, such as some Bama, Greenville, Lucedale, and Malbis soils. Bigbee, Lucy, and Troup soils are not suitable for terracing because the sandy soils are subject to severe erosion and gully formation when water is concentrated on their surfaces. Grassed waterways or underground tile outlets are needed to safely drain concentrated water flows from soils where terraces and diversions are installed. Diversions intercept surface runoff from uplands and divert the water around fields on toe slopes to lower elevations.

Contour farming is very effective in reducing erosion on cultivated cropland. It is best suited to soils that have smooth, uniform slopes, such as Bama, Greenville, Lucedale, and Malbis soils. Contour farming should always be used in conjunction with terraces or diversions to control concentrated water flow erosion.

Soil blowing is a hazard on most upland soils, especially early in spring when plants are small. The problem is most severe on prepared seedbeds. Soil blowing can damage these soils if winds are strong and if the soils are dry and do not have plant cover or surface residues. Maintaining plant cover, crop residues,

or rough surfaces with proper tillage minimizes soil blowing. Strips of close-growing crops or small grains are effective windbreaks.

Information on erosion control practices is available at the local office of the Soil Conservation Service.

Irrigation. Monroe County has an adequate amount of rainfall for crops that are commonly grown. Prolonged droughts are rare; however, the distribution of rainfall during spring and summer is usually such that periods of drought occur during the growing season of most years. Irrigation can help to prevent drought stress during most years. The soils commonly used for cultivated crops are suited to irrigation. However, poorly drained to moderately well drained soils, such as Atmore, Chrysler, and Iuka soils, rarely need irrigation.

Soil tilth is an important factor in plant growth, and it affects the infiltration of water into the soil. Soils that have good tilth have a granular and porous surface layer. Tilth is affected by past farming operations and by the degree of erosion that has occurred on the soils.

Most of the soils that are used for crops in Monroe County have a loam surface layer that is dark to light in color and low in organic matter content. Regular additions of crop residue, manure, and other organic material can improve soil structure and reduce crusting.

The use of large tractors and heavy equipment results in compaction of layers in most soils. These layers are normally 2 to 12 inches below the soil surface. They are called traffic pans or plowpans, and they restrict infiltration of water and growth of plant roots. Soils that are likely to develop plowpans include Cahaba, Greenville, Lucedale, Malbis, and Poarch soils.

Soil fertility is naturally low in most of the soils in Monroe County. All but the Prim soils need applications of ground limestone to neutralize soil acidity. Crops on all soils in the county respond well to fertilizer. Levels of available phosphorus and potash are low in most of the soils. However, some fields have a buildup of phosphorus and potassium because of applications of high rates of commercial fertilizer. Additions of lime and fertilizer should be based on the results of soil tests, on the need of crops, and on the expected level of yields. Leaching is a problem on sandy soils, such as Bigbee, Lucy, and Troup soils. If high rates of nitrogen are used on these soils, split applications are practical. The Cooperative Extension Service can help to determine the kinds and amounts of fertilizer and lime to apply.

Drainage is needed on several soils in the county. Some of these soils are naturally too wet to produce crops and pasture plants that are common in Monroe County. On other soils, drainage can increase crop and pasture production. Surface drainage systems remove water that accumulates on the soil, and subsurface drainage systems lower the water table. Soil wetness is a problem on Atmore, Bibb, Escambia, Stough, and Lenoir soils.

Field crops suited to the soils and climate of Monroe County include many that are not now commonly grown. Soybeans, corn, cotton, and wheat are the main crops. Grain sorghum, vegetable crops, and similar crops can be grown if economic conditions are favorable.

Specialty crops include melons, sod, peas, and cucumbers. Bama, Cahaba, Greenville, Lucedale, and Malbis soils are well suited to use for specialty crops. If economic conditions were favorable, a larger acreage would be grown. Pecans are the only orchard crops grown commercially in the county. Blueberries are well suited to the soils in this area, but the acreage used for blueberries is small. Wheat, rye, and oats are the only close-growing crops planted for grain production. However, barley could be grown. Information and suggestions for growing specialty crops can be obtained from the local offices of the Cooperative Extension Service and the Soil Conservation Service.

Pasture and hay crops are important in Monroe County. Bahiagrass, hybrid bermudagrass, and common bermudagrass are the main perennial grasses grown for pasture and hay. Wheat, ryegrass, and rye are grown for annual cool-season forage, and millet, sorghum, and hybrid forage sorghum provide most of the annual warm-season forage. These annuals are generally grown on cropland for temporary grazing. Arrowleaf clover, crimson clover, ball clover, and other cool-season forage legumes grow on most soils in the county, especially if agricultural limestone is applied to the soils in proper amounts. Alfalfa, a warm-season legume, is well adapted to the well drained Bama, Greenville, and Lucedale soils.

Several management practices are needed on all soils that are used for pasture and hay production. These practices include proper grazing or cutting heights, weed control, proper fertilization, rotation grazing, and scattering animal droppings. Soils, such as Atmore soils, are better suited to summer grazing because of the wetness during winter and early in spring. Overgrazing, low fertilization, and acid soils are the three greatest problems associated with pasture production. Any of the three results in weak plants and poor stands that are quickly infested with weeds. The best way to prevent weeds from becoming established is to maintain a dense ground cover of desired pasture plants.

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 yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that insures the smallest possible loss.

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

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 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 rangeland, 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. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VII. 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.

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 limitation is 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 shallow, droughty, or stony.

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

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

Woodland Management and Productivity

Jerry L. Johnson, forester, Soil Conservation Service, helped to prepare this section.

In Monroe County, 519,700 acres, or 80 percent of the county is commercial forest land. Forest acreage increased 2 percent from 1972 to 1982. The increase was because of the planting of trees on marginal cropland and the reforestation of idle land. This occurred primarily because of changes in landownership. Private landowners own about 66 percent of the forest land; industry owns 32 percent; and 2 percent is public forest land *(13)*.

Forest land in Monroe County consists of 58,300 acres of longleaf-slash pine, 148,500 acres of loblolly-shortleaf pine, 122,000 acres of oak-pine, 122,000 acres of oak-hickory, 53,000 acres of oak-gum-cypress, and 15,900 acres of nonstocked forest land. The forests contain 222,700 acres of sawtimber, 132,600 acres of poletimber, and 148,500 acres of seedlings and saplings. About 15,900 acres are nonstocked areas.

Hardwoods grow best in bottom land areas adjacent to streams. Monroe County has 434,900 acres of soils that are best suited to pine and 84,800 acres best suited to

hardwoods. About 71 percent of the soils in Monroe County has a site index of 80 or above for loblolly pine.

Forestry makes a major contribution to the economy of Monroe County. In 1982, the value of forest products at the first primary processing point was 26.2 million *(1)*. Forestry accounted for 64 percent of the total revenue of forestry and agricultural commodities *(10)*.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol (woodland suitability) for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates high productivity; 2 and 3, moderate; and 4, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w*, indicates excessive water in or on the soil; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: w, c, s, f, and r.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in a well-managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *plant competition* indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that normally occur.

Trees to plant are those that are suited to the soils and to commercial wood production. These trees are those that woodland managers generally favor. They are selected on the basis of growth rate, quality, value, and marketability.

Recreation

Gregory R. Brannon, soil scientist, Soil Conservation Service, helped to prepare this section.

There is an increasing demand in Monroe County for recreation areas that incorporate boating, swimming, fishing, hiking, and camping. Most of the land within public areas, such as Little River State Park on the Escambia county Line and Natchez State Lake near Beatrice, are available for some recreational activities.

The Alabama River provides opportunities for fishing and boating. A few boat ramps have been constructed for public use, but there is a pressing need for more river access areas and boat ramps.

Deer and turkey hunting is popular in Monroe County, but little, if any, of the total acreage is available to the public. Permission to hunt on private property should be obtained from the landowner.

The potential for additional development of recreation areas is favorable (fig. 8). The areas of soils having the highest potential for hiking, camping, and trail riding are in general soil map units 1, 2, 3, and 4 (see the "general soil map units" section). General soil map unit 6 is dominated by hilly terrain, wood formations, rock outcrops, and by numerous streams that provide a variety of recreational activities. General soil map units 1 and 2 are more suitable for playgrounds and picnic areas.

In table 8, 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

Figure 8.—Recreational facilities on Saffell very gravelly sandy loam, 5 to 8 percent slopes.

size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for 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 8, 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 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

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 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

Robert E. Waters, biologist, Soil Conservation Service, helped to prepare this section.

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 9, the soils of Monroe County 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; in determining the intensity of management needed for each element of the habitat; and in selecting areas on which to manage wildlife habitat for pay hunting.

The ratings refer to only the potential of the soil, not to present conditions on a particular site. The ratings consider neither present land use, present wildlife habitat, nor present wildlife populations. These and other conditions must be determined by onsite examination.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

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

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

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

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are dewberry, blackberry, croton, pokeweed, partridge pea, crabgrass, and paspalum.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of

hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, yellow-poplar, cherry, sweetgum, persimmon, sassafras, sumac, viburnums, holly, beech, hawthorn, dogwood, hickory, and hackberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are holly, pyracantha, dogwood, autumn-olive, and crabapple.

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

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, cattails, 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, beaver ponds, and wildlife ponds.

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

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, mourning dove, mockingbird, killdeer, blackbird, 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, vireos, woodpeckers, squirrels, gray fox, raccoon, deer, and woodpeckers.

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, rails, kingfishers, otter, turtles, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations 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, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to: 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 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential (fig. 9), and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a slowly permeable layer, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of

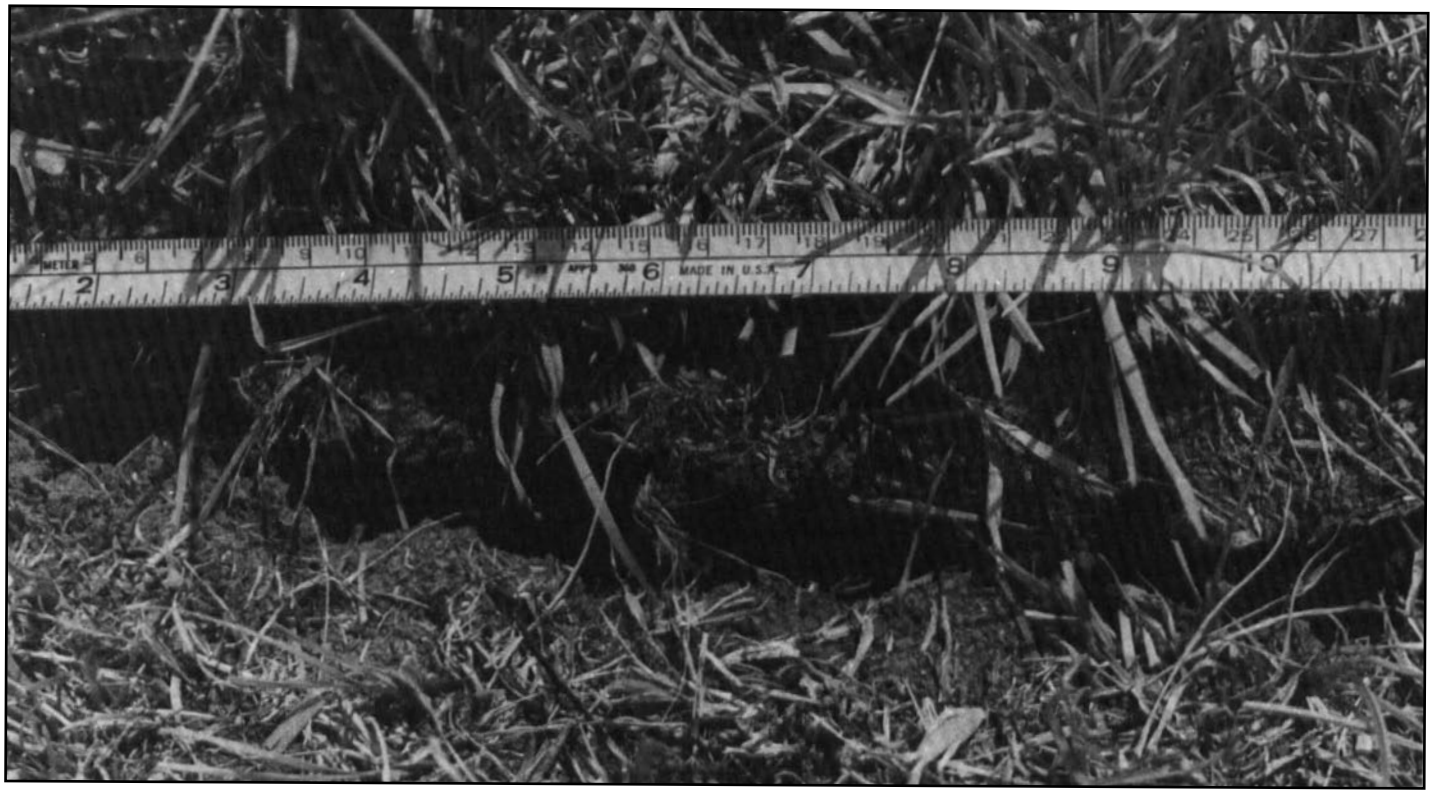


Figure 9.—Cracks at the surface of Beatrice silt loam, 1 to 5 percent slopes, caused by soil shrinking during periods of low rainfall.

gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a slowly permeable layer, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a slowly permeable layer, 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 11 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 11 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 60 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

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

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

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

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

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, 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 or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

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

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

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

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

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

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

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

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

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

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

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an

appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

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

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives 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 (fig. 10). Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against

Figure 10.—Pond for irrigation, recreation, fish production, and livestock. It is in an area of Bama sandy loam, 5 to 10 percent slopes.

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 and a high content of stones or boulders, or organic matter. 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 the depth to bedrock or to layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, susceptibility to flooding, and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a slowly permeable layer, large stones, slopes, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as aluminum. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. 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 reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as aluminum, 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 19.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

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

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 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 *(4)* and the system adopted by the American Association of State Highway and Transportation Officials *(3)*.

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-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 19.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area, or from nearby areas, and on field examination.

Physical and Chemical Properties

Table 15 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 clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage 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 many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

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

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

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. 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 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 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 intake 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 high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 16 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 is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and 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 16 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 high. A water table that is seasonally high for less than 1 month is not indicated in table 16.

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.

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

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and

electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a 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 is also 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 several typical pedons in the survey area are given in table 17 and the results of chemical analysis in table 18. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the Agronomy and Soils Laboratory at Auburn University, Auburn, Alabama, and 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 oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(5, 14)*.

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).

Extractable acidity—method of Hajek, Adams, and Cope (5).

Cation-exchange capacity—sum of cations (5A3a).

Cation-exchange capacity—ammonium chloride (5A7a).

Base saturation—method of Hajek, Adams, and Cope (5).

Reaction (pH)—1:1 water dilution (8C1a).

Engineering Index Test Data

Table 19 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. Some of the pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Others are located by footnotes in table 19. The soil samples were tested by the Alabama Highway Department, Bureau of Materials and Tests, Montgomery, Alabama.

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); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(12)*. 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 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

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 Udult (*Ud*, meaning humid, plus *ult*, from Ultisol).

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 Paleudults (*Pale*, meaning excessive development, plus *udults*, the suborder of the Ultisols that have 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 Paleudults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, and soil reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, siliceous, thermic Typic Paleudults.

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. An example is the Bama 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 (11)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (12)*. 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."

Arundel Series

The Arundel series consists of moderately deep, well drained, very slowly permeable soils on uplands in the northern part of the county. They formed in clayey marine sediments underlain by sandstone, siltstone, or clayey shale. Slopes range from 8 to 35 percent.

Arundel soils are associated with Beatrice, Greenville, and Luverne soils. Beatrice soils are on lower elevations than Arundel soils and are deeper to bedrock. Greenville and Luverne soils are on higher elevations than Arundel soils and are deeper to bedrock.

Typical pedon of Arundel loam, 8 to 35 percent slopes; in a forested area about 5 miles northeast of Fountain; 200 feet south and 1,600 feet west of the northeast corner of sec. 22, T. 8 N., R. 7 E.

A—0 to 5 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; friable; many fine and few medium and coarse roots; about 10 percent by volume siltstone fragments 2 to 50 mm across; extremely acid; clear wavy boundary.

Bt1—5 to 18 inches; brown (7.5YR 5/4) clay; moderate fine blocky structure; very firm; few fine, medium, and coarse roots; thin continuous clay films on faces of peds; about 10 percent by volume siltstone fragments 12 to 55 mm across; extremely acid; clear wavy boundary.

Bt2—18 to 22 inches; brown (7.5YR 5/4) clay loam; common medium distinct yellowish red (5YR 5/6) mottles; strong very fine blocky structure; very firm; few fine, medium, and coarse roots; about 15 percent by volume siltstone fragments 5 to 75 mm across; thin continuous clay films on faces of peds; extremely acid; clear wavy boundary.

Cr—22 to 60 inches; pale olive (5Y 6/3) soft fragmented clayey shale; weak fine platy structure; hard; dark brown (10YR 4/3) clay coating on shale; extremely acid.

Thickness of the solum and depth to bedrock range from 20 to 40 inches. These soils range from extremely acid to strongly acid throughout.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1 to 3. It is silt loam, loam, or sandy loam. Fragments of siltstone or sandstone ranging from 2 millimeters to 200 millimeters across make up to 15 percent of the volume.

The Bt horizon has hue of 5YR, 7.5YR, or 10YR; value of 4 to 6; and chroma of 3 to 6. Mottles in shades of brown or red range from none to common. In some pedons, the lower part of the B horizon is mottled in shades of red, brown, gray, or olive. The Bt horizon is silty clay loam, clay loam, silty clay, or clay. Clay content of the upper 20 inches of the Bt horizon ranges from 35 to 78 percent. Fragments of siltstone or sandstone ranging from 2 millimeter to more than 25 millimeter across make up to 15 percent of the volume. The percentage of fragments increases with depth. Some pedons have a BC or C horizon or both. These horizons are 5 to 10 inches thick and have similar hue, value, chroma, and texture as the Bt horizon. Mica flakes range from none to many in these horizons.

The Cr horizon is alternating layers of sandstone, siltstone, or clayey shale, or it is thick beds of any one of these. Fresh exposures of this horizon can be cut with a spade.

Atmore Series

The Atmore series consists of deep, poorly drained, moderately slowly permeable soils on slightly depressed upland flats in the southern part of the county. They formed in loamy marine and fluvial sediments. Slopes range from 0 to 1 percent.

Atmore soils are associated with Escambia, Malbis, and Poarch soils. Escambia soils are on slightly higher elevations than Atmore soils and are better drained. Malbis and Poarch soils are on higher elevations than Atmore soils and are better drained.

Typical pedon of Atmore silt loam, 0 to 1 percent slopes; in a forested area, 1.75 miles northeast Excel; 1,200 feet south and 2,300 feet west of the northeast corner of sec. 36, T. 6 N., R. 7 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; very friable; many fine roots; few small nodules of iron; very strongly acid; abrupt smooth boundary.

Eg—3 to 6 inches; light brownish gray (10YR 6/2) very fine sandy loam; weak fine granular structure; very friable; few fine nodules of ironstone; common fine and medium roots; very strongly acid; clear smooth boundary.

Bg/Eg—6 to 29 inches; 60 percent by volume light gray (10YR 7/2) fine sandy loam; many fine distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; 40 percent by volume gray (10YR 6/1) fine sandy loam; weak medium subangular blocky structure; very friable; slightly cemented; few fine roots; few fine nodules of ironstone; very strongly acid; gradual wavy boundary.

Btvg1—29 to 40 inches; light gray (10YR 7/2) fine sandy loam; many medium distinct light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; weakly cemented; about 5 percent by volume nodular plinthite; very strongly acid; clear wavy boundary.

Btvg2—40 to 50 inches; mottled light gray (10YR 7/1), yellowish brown (10YR 5/6), and red (2.5YR 4/6) fine sandy loam; moderate medium subangular blocky structure; friable; about 35 percent by volume firm, brittle, and compact; few fine nodules of ironstone; about 15 percent by volume nodular plinthite; very strongly acid; gradual wavy boundary.

Btvg3—50 to 68 inches; mottled yellowish red (5YR 4/6), light gray (10YR 7/1), and brownish yellow (10YR 6/6) clay loam; weak medium subangular blocky structure; friable; about 30 percent by volume firm, brittle, and compact; 10 percent by volume nodular plinthite; very strongly acid.

Thickness of the solum ranges from 60 to more than 70 inches. Depth to horizons that have more than 5 percent plinthite ranges from 24 to 50 inches. Nodules of ironstone range from 0 to 5 percent by volume. These soils range from extremely acid to strongly acid throughout. In most pedons, the B horizon is 2 to 35 percent by volume tongues of albic material.

The A horizon has hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 or 2. It is silt loam, loam, or fine sandy loam.

The Eg horizon and the Bg/Eg horizon have hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. Mottles in shades of red, brown, or yellow range from few to many. These horizons are very fine sandy loam, fine sandy loam, loam, or silt loam.

The Btvg horizon is mottled in shades of gray, brown, red, and yellow, or it has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2 and has few to many mottles in shades of red, brown, and yellow. The upper part of the Btvg horizon is sandy loam, fine sandy loam, silt loam, silty clay loam, or clay loam. The upper 20 inches of the Btvg horizon is more than 20 percent silt and 6 to 18 percent clay content. Some pedons have a Btg horizon above the Btvg horizon that has the same range in color and texture as the Btvg horizon but has less than 5 percent plinthite.

Bama Series

The Bama series consists of deep, well drained, moderately permeable soils on uplands throughout the county. They formed in loamy marine and fluvial sediments. Slopes range from 1 to 10 percent.

Bama soils are associated with Lucedale, Malbis, and Saffell soils. Lucedale and Malbis soils are on similar elevations. Lucedale soils are rhodic. Malbis soils have a yellowish brown argillic horizon and more than 5 percent plinthite. Saffell soils are on adjacent hill slopes and are gravelly throughout.

Typical pedon of Bama sandy loam, 1 to 5 percent slopes; about 0.2 mile north of Monroe County High School near Monroeville; 2,250 feet south and 2,200 feet west of the northeast corner of sec. 14, T. 6 N., R. 7 E.

A—0 to 6 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

BA—6 to 13 inches; yellowish red (5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; clear wavy boundary.

Bt1—13 to 22 inches; yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—22 to 40 inches; yellowish red (5YR 4/8) sandy clay loam; weak, medium, subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of peds; strongly acid; clear wavy boundary.

Bt3—40 to 65 inches; red (2.5YR 4/8) sandy clay loam; weak medium subangular blocky structure; thin continuous clay films on faces of peds; friable; strongly acid.

Thickness of the solum is more than 60 inches. Iron concretions and quartz gravel 2 to 15 mm in diameter, or both, range from 0 to 10 percent by volume. These soils are very strongly acid or strongly acid except where the surface layer has been limed.

The A horizon has hue of 5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. It is fine sandy loam, sandy loam, or loam.

The E horizon, if present, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam, sandy loam, or loam.

The BA or BE horizon, if present, has hue of 5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. It is fine sandy loam, sandy loam, or loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 6 to 8. It is sandy loam, sandy clay loam, loam, or clay loam and has 20 to 46 percent silt in the control section. Mottles are in shades of red, brown, or yellow. In some pedons, the Bt horizon below a depth of about 40 inches has hue of 10R or 2.5YR, value of 3, and chroma of 4 or 6; or it is mottled in shades of red, brown, or yellow.

Beatrice Series

The Beatrice series consists of deep, moderately well drained, very slowly permeable soils on uplands in the northern part of the county on the Coastal Plain. They formed in clayey, shaly marine or old lakebed sediments. Slopes range from 1 to 10 percent.

Beatrice soils are associated with Arundel and Luverne soils. Arundel soils are on adjacent, higher hill slope elevations and are shallower to bedrock than Beatrice soils. Luverne soils are on adjacent higher convex uplands, are better drained than Beatrice soils, and are underlain by stratified loamy marine sediments.

Typical pedon of Beatrice silt loam, 1 to 5 percent slopes; in a forested area about 1.75 miles southwest of Beatrice; 900 feet south and 1,500 feet east of the northwest corner of sec. 26, T. 9 N., R. 8 E.

Ap—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; friable; few fine roots; medium acid; clear smooth boundary.

Bt1—3 to 16 inches; red (2.5YR 4/6) clay; moderate fine subangular blocky structure; firm; few fine roots; thin continuous distinct clay films on faces of peds; few old cracks filled with dark grayish brown silt loam material; very strongly acid; clear wavy boundary.

Bt2—16 to 24 inches; yellowish red (5YR 4/6) clay; many medium distinct red (2.5YR 4/6), yellowish brown (10YR 5/6), and light gray (10YR 7/1) mottles; strong fine angular blocky structure; very firm; few fine roots; thin continuous distinct clay films on horizontal faces of peds; few almost vertical nonintersecting slickensides; very strongly acid; gradual wavy boundary.

Bt3—24 to 41 inches; mottled yellowish red (5YR 4/6), red (2.5YR 4/6), yellowish brown (10YR 5/6), and light gray (10YR 7/1) clay; strong fine angular blocky structure; very firm; few fine roots; thin continuous distinct clay films on horizontal faces of peds; few almost vertical nonintersecting slickensides; very strongly acid; clear wavy boundary.

BC—41 to 50 inches; light brownish gray (2.5Y 6/2) clay; many medium distinct yellowish brown (10YR 5/8) and red (2.5YR 4/6) mottles; moderate thick platy structure parting to moderate fine subangular blocky; very firm; slickensides; very strongly acid; gradual wavy boundary.

C—50 to 72 inches; light olive gray (5Y 6/2) shaly clay; common medium distinct red (2.5YR 4/6) and yellowish brown (10YR 5/4) mottles; strong medium platy structure; extremely firm; interbedded thin strata of clay loam and sandy clay loam; very strongly acid.

Thickness of the solum ranges from 40 to 60 inches. These soils are extremely acid or very strongly acid except where the surface layer has been limed.

The A horizon has hue of 10YR or 7.5YR, value of 3 to 6, and chroma of 2 to 4. The E horizon, if present, is about 4 inches thick and has hue of 10YR, value of 4 or 5, and chroma of 4 to 6. The A and E horizons are silt loam, loam, sandy loam, or fine sandy loam.

The upper part of the Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. In some pedons, it has few mottles in shades of red or brown. The lower part of the Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8 and has common to many mottles in shades of gray, red, yellow, or brown; or it is mottled in shades of red, brown, yellow, and gray. Mottles that have chroma of 2 or less are within the upper 10 to 24 inches of the Bt horizon. The Bt horizon is clay.

The BC or CB horizon, if present, has hue of 10YR to 5Y, value of 6 or 7, and chroma of 1 or 2 and has mottles in shades of red, yellow, or brown; or it is mottled in shades of gray, red, yellow, and brown. The BC or CB horizon is clay, clay loam, or sandy clay loam.

The C horizon has the same colors as the BC or CB horizon, and it is weathered clayey shale stratified with sandy clay loam and clay loam in some pedons. The clayey shale layers range from a few millimeters to a few centimeters in thickness, and the loamy material is a few millimeters thick. At depths of more than 60 inches, the clayey shale is continuous.

Benndale Series

The Benndale series consists of deep, well drained, moderately permeable soils on uplands in the southern part of the county. They formed in loamy marine and fluvial sediments. Slopes range from 1 to 5 percent.

Benndale soils are associated with Bama, Lucy, and Saffell soils. Bama soils are on adjacent, higher elevations and have a red argillic horizon that is more than 18 percent clay content. Lucy and Saffell soils are on lower hill slope elevations than Benndale soils. Lucy soils have loamy sand surface and subsurface horizons more than 20 inches thick and a red argillic horizon. Saffell soils are gravelly throughout.

Typical pedon of Benndale sandy loam, 1 to 5 percent slopes; 1.5 miles northwest of Bermuda; 2,640 feet south and 1,650 feet west of the northeast corner of sec. 12, T. 5N., R. 9 E.

A—0 to 5 inches; grayish brown (10YR 5/2) sandy loam; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

E—5 to 10 inches; pale brown (10YR 6/3) sandy loam; weak fine granular structure; very friable; common fine roots; strongly acid; clear wavy boundary.

Bt1—10 to 18 inches; light yellowish brown (10YR 6/4) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Bt2—18 to 43 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable; few fine roots; few fine quartz pebbles; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Bt3—43 to 57 inches; strong brown (7.5YR 5/6) sandy loam; weak fine subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Bt4—57 to 64 inches; light yellowish brown (10YR 6/4) sandy clay loam; few medium distinct red (2.5YR 4/8) mottles; weak fine subangular blocky structure; friable; less than 2 percent by volume nodular plinthite at about 60 inches; thin patchy clay films on faces of peds; strongly acid.

Thickness of the solum is more than 60 inches. These soils are very strongly acid or strongly acid except where the surface layer has been limed.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 or 3. It is sandy loam or loamy sand.

The E horizon, if present, has hue of 10YR, value of 6 or 7, and chroma of 3 or 4. It is sandy loam or loamy sand.

The BE horizon, if present, has hue of 10YR, value of 6 or 7, and chroma of 4 to 6. It is sandy loam or fine sandy loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. The lower part of the Bt horizon in some pedons has mottles in shades of red, brown, and gray. The Bt horizon is fine sandy loam, sandy loam, or sandy clay loam.

Bibb Series

The Bibb series consists of poorly drained, nearly level, moderately permeable soils on flood plains throughout the county. They formed in stratified sandy and loamy alluvial sediments. Slopes range from 0 to 2 percent.

Bibb soils are associated with most upland soils in the county. These soils are better drained than Bibb soils.

Typical pedon of Bibb loam, 0 to 1 percent slopes, frequently flooded; in a wooded area about 1.5 miles northeast of Goodway on Big Escambia Creek; 1,200 feet north and 2,200 feet west of the southeast corner of sec. 31, T. 5 N., R. 7 E.

Ag—0 to 8 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; clear wavy boundary.

Cg1—8 to 30 inches; gray (10YR 5/1) sandy loam; massive; loose; few fine and medium roots; very strongly acid; clear wavy boundary.

Cg2—30 to 60 inches; stratified gray (10YR 6/1) and light gray (10YR 7/1) sandy loam; thin strata of light gray (10YR 7/1) loamy sand; massive; friable; about 10 percent by volume quartz pebbles 2 mm to 20 mm across; very strongly acid.

The Bibb soils are more than 60 inches thick. They are very strongly acid or strongly acid. A few flakes of mica are in some pedons.

The Ag horizon has hue of 10YR or 2.5Y, value of 3 to 7, and chroma of 2 or less; or it is neutral. The Ag horizon is sandy loam, loam, or silt loam.

The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 7, and chroma of 2 or less; or it is neutral. Few to many mottles or strata of red, yellow, and brown are present. Layers in the 10- to 40-inch control section are sandy loam, fine sandy loam, loam, or silt loam and are stratified. Thin strata of sand, loamy sand, or loamy fine sand are in some pedons. The Cg horizon averages less than 18 percent clay content.

Bigbee Series

The Bigbee series consists of deep, excessively drained, rapidly permeable soils on terraces of the Alabama River and its tributaries. They formed in sandy alluvial and fluvial sediments. Slopes range from 0 to 5 percent.

Bigbee soils are associated with Cahaba, Izagora, Smithton, and Stough soils. Cahaba soils are on similar elevations as Bigbee soils, but have a loamy argillic horizon. Izagora, Smithton, and Stough soils are on lower elevations than Bigbee soils and have a loamy argillic horizon.

Typical pedon of Bigbee sand, 0 to 5 percent slopes, occasionally flooded; in a forested area about 1 mile west of Chrysler; 400 feet south and 2,400 feet west of the northeast corner of sec. 24, T. 4 N., R. 3 E.

A—0 to 6 inches; dark grayish brown (10YR 4/2) sand; very weak fine granular structure; very friable; common fine roots; few fine quartz pebbles; very strongly acid; clear smooth boundary.

C1—6 to 13 inches; yellowish brown (10YR 5/6) sand; single grained; loose; few fine roots; strongly acid; gradual smooth boundary.

C2—13 to 42 inches; reddish yellow (7.5YR 6/6) sand; single grained; loose; few fine roots; about 3 percent by volume quartz pebbles 5 mm to 20 mm across; strongly acid; gradual wavy boundary.

C3—42 to 80 inches; very pale brown (10YR 7/4) sand; single grained; loose; about 8 percent by volume quartz pebbles 5 mm to 20 mm across; strongly acid.

The Bigbee soils are more than 60 inches thick. They are very strongly acid to medium acid.

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

The upper part of the C horizon has hue of 10YR to 5YR, value of 4 to 7, and chroma of 4 to 8. It is sand or fine sand. The 10- to 40-inch particle-size control section is 5 to 10 percent silt plus clay.

The lower part of the C horizon has hue of 10YR, value of 6 to 8, and chroma of 1 to 6. In some pedons, it has mottles in shades of brown. The lower part of the C horizon is fine sand or sand. A few pockets of uncoated sand grains are in some pedons. Content of quartz pebbles less than 5 mm across is less than 15 percent.

Cahaba Series

The Cahaba series consists of deep, well drained, moderately permeable soils on terraces of the Alabama River and its tributaries. They formed in loamy and sandy alluvial and fluvial sediments. Slopes range from 0 to 3 percent.

Cahaba soils are associated with Bigbee, Izagora, Smithton, and Stough soils. Bigbee soils are on similar elevations as Cahaba soils, but are excessively drained and sandy throughout. Izagora, Smithton, and Stough soils are on lower elevations and are more poorly drained than Cahaba soils.

Typical pedon of Cahaba sandy loam, 0 to 2 percent slopes, occasionally flooded; in a pasture about 1 mile west of the Alabama River; 250 feet north and 100 feet west of the southeast corner of sec. 14, T. 7 N., R. 5 E.

Ap—0 to 9 inches; brown (10YR 4/3) sandy loam; weak medium granular structure; very friable; some mixing of BA horizon; common fine roots; strongly acid; abrupt wavy boundary.
Bt1—9 to 14 inches; yellowish red (5YR 4/8) sandy loam; weak medium subangular blocky structure; friable; some of Ap horizon in old root holes; common fine roots; sand grains coated and bridged with clay; strongly acid; clear smooth boundary.
Bt2—14 to 45 inches; yellowish red (5YR 4/6) sandy clay loam; moderate fine subangular blocky structure; friable; common fine roots; few thin patchy clay films on faces of peds; medium acid; gradual smooth boundary.
Bt3—45 to 50 inches; yellowish red (5YR 5/6) sandy clay loam; moderate fine subangular blocky structure; friable; few thin patchy clay films on faces of peds; strongly acid; clear smooth boundary.
C—50 to 80 inches; strong brown (7.5YR 5/6) fine sandy loam; massive; friable; few very fine flakes of mica; few thin strata of light yellowish brown (10YR 6/4) loamy sand; very strongly acid.

Thickness of the solum ranges from 36 to 60 inches. These soils range from very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. It is loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam.

The E horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4; or it has hue of 7.5YR, value of 5, and chroma of 6 or 8.

The Bt horizon has hue of 5YR, 2.5YR, or 10R, value of 4 or 5, and chroma of 6 or 8. It is sandy loam, sandy clay loam, loam, or clay loam and is 18 to 35 percent clay content and 20 to 50 percent silt.

The BC or CB horizon, if present, is strong brown, yellowish red, or red. It is sandy loam or fine sandy loam. In some pedons, this horizon is mottled in shades of yellow and brown.

The C horizon ranges in color from yellowish brown to red and is commonly interbedded or stratified with sand, loamy sand, and fine sandy loam. It can contain mottles of yellow, brown, and gray. Few to common flakes of mica can be present in the lower part of the horizon.

Chrysler Series

The Chrysler series consists of deep, moderately well drained, slowly permeable soils on flood plains and terraces of the Alabama River and its tributaries. They formed in clayey alluvial and fluvial sediments. Slopes range from 0 to 5 percent.

Chrysler soils are associated with Congaree, Lenoir, Una, and Urbo soils. Congaree soils are on higher elevations and are better drained than Chrysler soils and have a fine-loamy argillic horizon. Lenoir, Una, and Urbo soils are on lower elevations and are more poorly drained than Chrysler soils.

Typical pedon of Chrysler silt loam, 0 to 5 percent slopes, occasionally flooded; in a forested area about 3 miles north of Chrysler; 800 feet west and 800 feet south of the northeast corner of sec. 6, T. 4 N., R. 4 E.

A—0 to 7 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.
Bt1—7 to 14 inches; yellowish red (5YR 5/6) silty clay; weak medium subangular blocky structure; firm; few fine roots; thin continuous clay films on faces of peds; very strongly acid; few fine flakes of mica; gradual wavy boundary.
Bt2—14 to 27 inches; mottled red (2.5YR 4/6); yellowish brown (10YR 5/6), and yellowish red (5YR 5/6) clay; moderate fine subangular blocky structure; very firm; few fine roots; thin continuous clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.
Bt3—27 to 72 inches; mottled red (2.5YR 4/6), yellowish brown (10YR 5/6), yellowish red (5YR 5/6), and light gray (10YR 7/1) clay; moderate medium subangular blocky structure; very firm; thin continuous clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.
C—72 to 96 inches; mottled red (2.5YR 4/6), yellowish red (5YR 5/6), light gray (10YR 7/1), and yellowish brown (10YR 5/6) thinly stratified sandy loam, sandy clay loam, loam, clay loam, and clay; massive; friable, very firm; very strongly acid.

Thickness of the solum is more than 60 inches. Fine flakes of mica ranges from none to common in the B and C horizons. These soils are very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. The E horizon, if present, is 3 to 7 inches thick and has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The A and E horizons are loam, fine sandy loam, or silt loam.

The upper part of the Bt horizon has hue of 7.5YR to 2.5YR, value of 4 to 6, and chroma of 4 to 8. In many pedons, this horizon is mottled in shades of yellow, brown, or red. Mottles that have chroma of 2 or less are within a depth of 30 inches. The lower part of the Bt horizon has hue of 10YR to 2.5YR, value of 4 to 7, and chroma of 1 to 8; or it is mottled in shades of yellow, brown, red, and gray. The Bt horizon is clay loam, silty clay loam, silty clay, or clay. The clay content of the upper 20 inches of the Bt horizon ranges from 35 to 60 percent and averages about 45 percent. Silt content is more than 30 percent.

The C horizon is mottled red, gray, yellow, and brown. It is sandy loam, sandy clay loam, clay loam, or clay and is generally stratified.

Congaree Series

The Congaree series consists of deep, well drained, moderately permeable soils on flood plains and terraces of the Alabama River and its tributaries. They formed in loamy alluvial and fluvial sediments. Slopes are 0 to 4 percent.

Congaree soils are associated with Chrysler, Lenoir, Una, and Urbo soils. These soils are on lower elevations than Congaree soils and have a clayey argillic horizon.

Typical pedon of Congaree loam, 0 to 4 percent slopes, occasionally flooded; in a cultivated field about 1 mile south of Eureka Landing; 550 feet south and 2,500 feet east of the northwest corner of sec. 19, T. 5 N., R. 3 E.

Ap—0 to 6 inches; brown (10YR 4/3) loam; weak fine granular structure; friable; many fine roots; common thin strata of very pale brown (10YR 7/3) sandy loam in upper 3 inches; common fine flakes of mica; neutral; abrupt smooth boundary.

C1—6 to 14 inches; brown (10YR 4/3) loam; massive; friable; many fine roots; common thin strata of pale brown (10YR 6/3) sandy loam; common fine flakes of mica; few reddish brown (5YR 4/3) root stains; neutral; clear smooth boundary.

C2—14 to 29 inches; brown (10YR 4/3) silt loam; massive; friable; many fine roots; few thin strata of pale brown (10YR 6/3) fine sand; common fine flakes of mica; slightly acid; clear smooth boundary.

C3—29 to 34 inches; brown (10YR 4/3) fine sandy loam; massive; very friable; common thin strata of very pale brown (10YR 7/3) loamy sand; common fine flakes of mica; slightly acid; clear smooth boundary.

C4—34 to 65 inches; dark yellowish brown (10YR 4/4) stratified loam, fine sandy loam, and silt loam and very pale brown (10YR 7/3) fine sand; massive; very friable; common fine flakes of mica; slightly acid.

The Congaree soils are more than 60 inches thick. They are very strongly acid to neutral throughout, but part of the control section has a pH of 5.5 or higher. Thin strata of contrasting textures are in the C horizon. Most pedons have few to many flakes of mica. Content of coarse fragments generally is less than 2 percent by volume.

The A horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 6. It is loam.

The C horizon to a depth of 30 inches or more has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. Mottles in shades of red, brown, or yellow are in some pedons. Below a depth of 30 inches, colors are similar to the upper part of the C horizon; however, some pedons have mottles that have chroma of 2 or less. The particle-size control section is silt loam, fine sandy loam, or loam and is generally stratified with sandier or more clayey material.

Escambia Series

The Escambia series consists of deep, somewhat poorly drained, slowly or moderately slowly permeable soils on uplands in the southern part of the county. They formed in loamy marine and fluvial sediments. Slopes range from 0 to 1 percent.

Escambia soils are associated with Atmore, Malbis, and Poarch soils. Atmore soils are on lower elevations and are more poorly drained than Escambia soils. Malbis and Poarch soils are on higher elevations and are better drained than Escambia soils.

Typical pedon of Escambia very fine sandy loam, 0 to 1 percent slopes; in a wooded area 1 mile southeast of Chrysler; 1,520 feet north and 1,340 feet west of the southeast corner of sec. 20, T. 4 N., R. 4 E.

Ap—0 to 9 inches; gray (10YR 5/1) very fine sandy loam; few medium distinct grayish brown (10YR 5/2) mottles; weak fine granular structure; very friable; very strongly acid; clear wavy boundary.

Bt1—9 to 18 inches; yellowish brown (10YR 5/6) fine sandy loam; many medium distinct gray (10YR 5/1) mottles; weak medium subangular blocky structure; very friable; few fine roots; Ap material mixed by roots and plowing; very strongly acid; clear wavy boundary.

Bt2—18 to 28 inches; yellowish brown (10YR 5/4) loam; few medium distinct yellowish brown (10YR 5/6) and gray (10YR 5/1) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; few fine pores; about 2 percent by volume nodular plinthite; less than 5 percent by volume quartz pebbles; gray mottles in old root channels; very strongly acid; clear smooth boundary.

Btv1—28 to 43 inches; reticulately mottled light gray (10YR 7/1), strong brown (7.5YR 5/6), and yellowish red (5YR 4/8) loam; weak thick platy structure parting to moderate medium subangular blocky; firm, 30 percent by volume brittle and compact; continuous distinct clay films on faces of peds; few medium roots; common fine pores; about 25 percent by volume nodular plinthite; very strongly acid; gradual wavy boundary.

Btv2—43 to 61 inches; reticulately mottled gray (10YR 6/1), yellowish brown (10YR 5/8), and red (2.5YR 4/8) clay loam; weak coarse angular blocky structure parting to moderate medium angular blocky; firm, 20 percent by volume brittle and compact; continuous distinct clay films on faces of peds; few fine pores; 15 to 20 percent by volume nodular plinthite; very strongly acid.

Thickness of the solum is more than 60 inches. Depth to horizons that have more than 5 percent plinthite ranges from 20 to 42 inches. These soils are very strongly acid or strongly acid in all horizons except where the surface layer has been limed. Iron concretions range from 0 to 5 percent throughout.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2. It is fine sandy loam, very fine sandy loam, or loam.

The E or BE horizon, if present, has hue of 10YR to 5Y, value of 5 or 6, and chroma of 1 to 3. Texture range is the same as the A horizon.

The upper part of the Bt horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 2 to 6. Mottles in shades of yellow, pale brown, and light gray range from few to common. This part of the Bt horizon is fine sandy loam, loam, or silt loam.

The lower part of the Bt horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 to 6 and has mottles in shades of red, brown, or gray; or it is mottled in shades of gray, brown, red, and yellow. Texture is fine sandy loam, loam, silt loam, or sandy clay loam. The upper 20 inches of the argillic horizon has less than 18 percent clay content and more than 20 percent silt. Plinthite in the B horizon ranges from 5 percent to about 28 percent by volume. In some pedons, the lower part of the Bt horizon is clay loam.

Esto Series

The Esto series consists of deep, well drained, slowly permeable soils on uplands in the southern and central part of the county on the Coastal Plain. They formed in clayey marine sediments. Slopes range from 3 to 10 percent.

Esto soils are associated with Bama, Lucy, Malbis, and Saffell soils. These soils are on similar elevations as Esto soils but have a loamy argillic horizon.

Typical pedon of Esto sandy loam, 3 to 10 percent slopes; in a wooded area 3 miles northeast of Excel; 2,500 feet north and 50 feet east of the southeast corner of sec. 29, T. 6 N., R. 8 E.

A—0 to 4 inches; brown (10YR 5/3) sandy loam; weak medium granular structure; very friable; many fine roots; about 5 percent by volume ironstone nodules less than 2 inches across and quartz pebbles less than 0.5 inch across; very strongly acid; clear wavy boundary.

Bt1—4 to 10 inches; strong brown (7.5YR 5/6) clay loam; weak fine subangular blocky structure; firm; many fine and medium roots; patchy clay films on faces of most peds; about 5 percent by volume ironstone nodules less than 2 inches across and quartz pebbles less than 0.5 inch across; very strongly acid; gradual wavy boundary.

Bt2—10 to 19 inches; yellowish red clay (5YR 5/6); common medium prominent light brownish gray (10YR 6/2) mottles, common medium distinct yellowish brown (10YR 5/4) mottles, and few fine distinct red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; very firm; common fine and medium roots; patchy clay films on faces of most peds; about 5 percent by volume ironstone nodules less than 2 inches across and quartz pebbles less than 0.5 inch across; very strongly acid; gradual wavy boundary.

Bt3—19 to 50 inches; mottled yellowish brown (10YR 5/4), red (2.5YR 4/6), light brownish gray (10YR 6/2), and weak red (10R 5/2) clay; moderate fine angular blocky structure; very firm; few fine roots; patchy clay film on faces of most peds; very strongly acid; clear wavy boundary.

Bt4—50 to 61 inches; brownish yellow (10YR 6/6) clay; many coarse prominent light gray (10YR 6/1) and red (2.5YR 4/6) mottles; weak medium subangular blocky structure; firm; patchy clay films on faces of most peds; about 2 percent by volume ironstone nodules less than 1 inch across; very strongly acid; gradual wavy boundary.

C—61 to 78 inches; mottled brownish yellow (10YR 6/6), light gray (10YR 7/1), red (2.5YR 4/6), and dusky red (10R 3/4) stratified sandy loam and sandy clay loam; massive; friable; common fine flakes of mica; very strongly acid.

Thickness of the solum is more than 60 inches. These soils are very strongly acid or strongly acid throughout except where the surface layer has been limed. Content of ironstone and quartz gravel ranges from 0 to 10 percent in the solum.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. It is fine sandy loam, sandy loam, or loamy sand.

The E horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 3 to 8. Texture range is the same as the A horizon. The BA or BE horizon, if present, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is sandy clay loam, sandy clay, or clay loam.

The upper part of the Bt horizon has hue of 5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 4 to 8. In most pedons, the Bt horizon is mottled in shades of gray, yellow, brown, and red. This part of the Bt horizon is clay loam, sandy clay, or clay.

The lower part of the Bt horizon has the same hue, value, and chroma as the upper part of the Bt horizon; or it is distinctly to prominently mottled in shades of gray, red, brown, and yellow. This part of the Bt horizon is clay loam, sandy clay, silty clay, or clay.

The C horizon, if present, is mottled in shades of yellow, gray, brown, or red. It ranges from sand to stratified layers of sandy loam, sandy clay loam, sandy clay, and clay.

Grady Series

The Grady series consists of deep, poorly drained, slowly permeable soils in round depressional areas on uplands in the central part of the county. They formed in clayey marine sediments. Slopes are smooth and concave and range from 0 to 2 percent.

Grady soils are associated with Bama, Lucedale, and Malbis soils. These soils are on higher landforms and are better drained than Grady soils, and they have a loamy argillic horizon.

Typical pedon of Grady loam, 0 to 2 percent slopes; in a cultivated area about 3 miles northwest of Uriah; 200 feet north and 2,500 feet east of the southwest corner of sec. 36, T. 5 N., R. 5 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam; moderate medium granular structure; friable; common fine roots; slightly acid; clear smooth boundary.

Btg1—6 to 13 inches; gray (10YR 5/1) clay loam; weak fine subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

Btg2—13 to 30 inches; gray (10YR 5/1) clay; few medium distinct yellowish brown (10YR 5/4) mottles; weak fine angular blocky structure; firm; thin patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

Btg3—30 to 54 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/8) mottles; weak fine angular blocky structure; very firm; thin clay films on faces of peds; strongly acid; gradual smooth boundary.

Btg4—54 to 65 inches; gray (10YR 6/1) clay; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; very firm; thin continuous clay films on faces of peds; strongly acid.

Thickness of the solum is more than 60 inches. These soils range from extremely acid to strongly acid except where the surface layer has been limed.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 4, and chroma of 1 or 2. It is loam or clay loam.

The E horizon, if present, has hue of 10YR or 2.5Y, value of 5 to 7; and chroma of 1 or 2. It is loam or clay loam. The BE horizon, if present, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2; or it is neutral. This horizon is sandy clay loam or clay loam.

The Bt horizon has hue of 10YR or 2.5YR, value of 4 to 7, and chroma of 1 or 2. It contains few to many mottles in shades of brown, yellow, and gray. In some pedons, the Bt horizon below a depth of about 30 inches is reticulately mottled in shades of gray, brown, and red. This horizon is clay or sandy clay.

Greenville Series

The Greenville series consists of deep, well drained, moderately permeable soils on uplands in the central and western parts of the county. They formed in clayey marine sediments. Slopes range from 2 to 8 percent.

Greenville soils are associated with Bama and Lucy soils. Bama and Lucy soils are on similar elevations as Greenville soils but have less than 35 percent clay content in the argillic horizon. Lucy soils have a loamy sand surface and subsurface layer 20 to 40 inches thick.

Typical pedon of Greenville sandy loam, 2 to 5 percent slopes; in a cultivated field, 4 miles northwest of Monroeville; 1,900 feet west and 250 feet north of the southeast corner of sec. 3, T. 7 N., R. 7 E.

Ap—0 to 6 inches; dark reddish brown (5YR 3/4) sandy loam; weak fine granular structure; very friable; few fine roots; slightly acid; abrupt smooth boundary.

Bt1—6 to 13 inches; dark red (2.5YR 3/6) clay loam; weak fine subangular blocky structure; friable; few fine roots; few fine concretions of ironstone; thin patchy clay films on faces of peds; medium acid; clear wavy boundary.

Bt2—13 to 75 inches; dark red (2.5YR 3/6) clay; weak fine subangular blocky structure; friable; few fine roots; thin continuous clay films on faces of peds; few fine concretions of ironstone; strongly acid.

Thickness of the solum is more than 72 inches. These soils range from medium acid to very strongly acid except where the surface layer has been limed. In some pedons a few quartz pebbles occur throughout.

The A horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 2 to 6. It is sandy loam, fine sandy loam, loam, or loamy fine sand. Where eroded, this horizon is sandy clay or clay loam.

The BA horizon, if present, has hue of 5YR to 10YR, value of 2 or 3, and chroma of 4 to 6. It is sandy clay loam or sandy clay.

The Bt horizon has hue of 2.5YR or 10R, value of 3, and chroma of 4 to 6. It is sandy clay, clay loam, or clay. Iron concretions range from few to common.

Halso Series

The Halso series consists of deep, moderately well drained, very slowly permeable soils in the northern part of the county. They formed in clayey, shaly marine sediments. Slopes range from 1 to 10 percent.

Halso soils are associated with Arundel and Luverne soils. Arundel soils are on adjacent hill slopes and are moderately deep to bedrock. Luverne soils are on adjacent higher elevations than Halso soils and are underlain by loamy sediments.

Typical pedon of Halso sandy loam, 1 to 5 percent slopes; in a forested area about 5 miles east of Old

Texas; 2,400 feet north and 50 feet east of the southwest corner of sec. 13, T. 9 N., R. 11 E.

A—0 to 5 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; abrupt smooth boundary.

Bt1—5 to 15 inches; dark red (2.5YR 3/6) clay; strong fine and medium angular blocky structure; sticky and plastic; common fine and medium roots; thick continuous clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—15 to 31 inches; yellowish red (5YR 4/6) clay; common medium distinct light brownish gray (2.5YR 6/2) and light yellowish brown (2.5Y 6/4) mottles; strong fine and medium angular blocky structure; sticky and plastic; few fine roots; thick continuous clay films on faces of peds; 30 percent by volume red (2.5YR 4/8) clayey shale less than 30 mm thick, interior mottled light gray (5Y 7/2), light brownish yellow (2.5Y 6/4), and yellowish red (5YR 4/6); strong platy structure; extremely acid; clear wavy boundary.

C—31 to 47 inches; 60 percent by volume mottled yellowish red (5YR 4/6), light olive gray (5Y 6/2), and yellowish brown (10YR 5/6) clayey shale less than 30 mm thick; strong platy structure; 40 percent by volume mottled light yellowish brown (10YR 6/4), yellowish red (5YR 4/6), and light brownish gray (2.5Y 6/2) clay loam; moderate fine subangular blocky structure; sticky and plastic; few fine roots; extremely acid; abrupt smooth boundary.

Cr—47 to 60 inches; mottled light brownish gray (2.5Y 6/2), yellowish brown (10YR 5/6), and yellowish red (5YR 4/6) clayey shale less than 40 mm thick; strong platy structure; extremely acid.

Thickness of the solum ranges from 25 to 50 inches, and depth to soft shale bedrock ranges from 40 to 60 inches. These soils range from extremely acid to strongly acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 2 to 4. It is loam, fine sandy loam, or sandy loam.

The upper part of the Bt horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 4 to 8. Mottles that have chroma 2 or less are within the upper 8 to 15 inches of the Bt horizon. The lower part of the Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8 and has common to many mottles in shades of gray, red, yellow, or brown; or it is mottled in shades of red, gray, brown, or yellow. The Bt horizon is clay or silty clay.

The BC or CB horizon, if present, has hue of 5YR or 5Y, value of 4 to 7, and chroma of 1 to 6 and has mottles in shades of red, yellow, or brown; or it is mottled in shades of gray, red, yellow, and brown. It is clay, silty clay, silty clay loam, clay loam, or sandy clay loam.

The C horizon, if present, has the same colors as the BC or CB horizon. It is massive or has granular or platy structure. This horizon ranges from sandy loam to clay that has crushed clay content of 25 to 50 percent. In some pedons, the C horizon is as much as 90 percent by volume clayey shale.

The Cr horizon constitutes a paralithic contact and is weathered shale.

Iuka Series

The Iuka series consists of deep, moderately well drained, moderately permeable soils on flood plains in the northern part of the county. They formed in loamy alluvial and fluvial sediments. Slopes range from 0 to 2 percent.

Iuka soils are associated with Mantachie soils. Mantachie soils are on lower elevations and are more poorly drained than Iuka soils.

Typical pedon of Iuka loamy sand in a wooded area of Iuka and Mantachie soils, 0 to 2 percent slopes, frequently flooded; 0.5 mile south of Keith and 100 feet north of Big Flat Creek; 900 feet north and 1,500 feet east of the southwest corner of sec. 10, T. 8 N., R. 7 E.

A—0 to 5 inches; light gray (10YR 7/2) loamy sand; single grained; very friable; strongly acid; clear smooth boundary.

C1—5 to 10 inches; mottled light yellowish brown (10YR 6/4), light gray (10YR 6/1), yellowish brown (10YR 5/6), and reddish yellow (7.5YR 6/8) fine sandy loam; few very thin strata of loamy fine sand; massive; friable; very strongly acid; clear smooth boundary.

C2—10 to 20 inches; mottled brown (10YR 5/3), light gray (10YR 7/1), light yellowish brown (10YR 6/4), and strong brown (7.5YR 5/6) loam; massive; friable; very strongly acid; gradual wavy boundary.

C3—20 to 30 inches; yellowish brown (10YR 5/4) loam; common medium distinct very pale brown (10YR 8/3) mottles and streaks of loamy sand; massive; friable; very strongly acid; clear smooth boundary.

C4—30 to 66 inches; mottled very pale brown (10YR 7/3) loamy fine sand and pale brown (10YR 6/3) fine sandy loam; common strata and pockets of loamy fine sand, fine sandy loam, loam and silt loam; massive; very friable; very strongly acid.

The Iuka soils are more than 60 inches thick. They are very strongly acid or strongly acid except where the surface layer has been limed. Thin bedding planes of contrasting textures are common in most pedons.

The A horizon has hue of 10YR or 7.5YR, value of 4 to 7, and chroma of 2 to 4. It is sandy loam, loamy sand, or loam.

The upper part of the C horizon has hue of 10YR, 7.5YR, or 2.5Y, value of 4 to 6, and chroma of 3 to 6; or it has hue of 10YR or 7.5YR, value of 4, and chroma of 2. Mottles that have chroma of 2 or less are within a depth of 20 inches. Texture is sandy loam, fine sandy loam, loam, or silt loam.

The lower part of the C horizon may not have a matrix color. It can be mottled in shades of gray, brown, or red; or it can be dominantly gray with many brown, red, and yellow mottles. This part of the C horizon is sandy loam, fine sandy loam, loam, silt loam, or loamy sand.

Clay content of the 10- to 40-inch control section is 10 to 18 percent. Some pedons have thin gravelly or sandy strata and some pedons are sandy clay loam or clay loam at a depth of more than 40 inches.

Izagora Series

The Izagora series consists of deep, moderately well drained, slowly permeable soils on terraces of the Alabama River and its tributaries. They formed in loamy and clayey alluvial and fluvial sediments. Slopes range from 0 to 4 percent.

Izagora soils are associated with Bigbee, Cahaba, Smithton, and Stough soils. Bigbee and Cahaba soils are on higher elevations and are better drained than Izagora soils. Smithton and Stough soils are on lower elevations and are more poorly drained than Izagora soils.

Typical pedon of Izagora fine sandy loam, 0 to 4 percent slopes, occasionally flooded; in a forested area about 2.75 miles north of Chrysler; 1,500 feet south and 1,300 feet east of the northwest corner of sec. 5, T. 4 N., R. 4 E.

A—0 to 5 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; medium acid; clear wavy boundary.

E—5 to 12 inches; very pale brown (10YR 7/4) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; medium acid; clear wavy boundary.

Bt1—12 to 25 inches; brownish yellow (10YR 6/8) loam; moderate medium subangular blocky structure; firm; common fine and medium roots; thin patchy clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—25 to 35 inches; brownish yellow (10YR 6/8) clay loam; common medium distinct light gray (10YR 7/2) and reddish yellow (5YR 6/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; thick continuous strong brown (7.5YR 5/8) clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3—35 to 63 inches; yellowish brown (10YR 5/8) clay; many medium prominent red (2.5YR 5/6), white (10YR 8/2), and brownish yellow (10YR 6/6) mottles; strong fine subangular blocky structure; very firm; few fine roots; thick continuous strong brown (7.5YR 5/8) clay films on faces of peds; strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 4. It is fine sandy loam, loam, or silt loam. The E horizon, if present, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. It is sandy loam, fine sandy loam, or loam. The A and E horizons range from extremely acid to medium acid.

The upper part of the Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. Gray, brown, and red mottles range from few to common below a depth of about 18 inches. This part of the Bt horizon is loam or clay loam.

The lower part of the Bt horizon has the same colors as the upper part and has hue of 5Y and chroma of 1 to 2; or it is mottled in shades of yellow, gray, brown, and red. The gray increases with depth. This part of the Bt horizon is clay loam or clay. The Bt horizon ranges from strongly acid to very strongly acid.

Clay content of the upper 20 inches of the argillic horizon ranges from 18 to 30 percent; the clay content of the lower part of the Bt horizon ranges from 35 to 50 percent. Silt content ranges from 30 to 50 percent in the upper part of the solum and from 30 to 35 percent in the lower part.

Lenoir Series

The Lenoir series consists of deep, somewhat poorly drained, slowly permeable soils on terraces of the Alabama River and its tributaries. They formed in clayey alluvial and fluvial sediments. Slopes range from 0 to 2 percent.

Lenoir soils are associated with Cahaba, Chrysler, and Stough soils. These soils are in similar positions on the landscape as Lenoir soils. The Cahaba soils are well drained and have a fine-loamy control section. Chrysler soils are moderately well drained. The Stough soils have a coarse-loamy control section.

Typical pedon of Lenoir loam, 0 to 2 percent slopes, frequently flooded; in a forested area about 3 miles north of Chrysler and 0.5 mile east of Mount Pleasant Landing; 30 feet south and 1,600 feet east of the northwest corner of sec. 6, T. 4 N., R. 4 E.

A—0 to 4 inches; grayish brown (10YR 5/2) loam; weak fine granular structure; friable; many medium roots; very strongly acid; clear smooth boundary.

Bt1—4 to 9 inches; yellowish brown (10YR 5/4) clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; very strongly acid; clear smooth boundary.

Bt2—9 to 23 inches; mottled light brownish gray (10YR 6/2), red (2.5YR 4/6), and yellowish brown (10YR

5/6) clay loam; moderate medium blocky structure; very firm; few fine roots; clay films on faces of peds; very strongly acid; clear smooth boundary.

Btg1—23 to 42 inches; gray (10YR 6/1) clay, common medium prominent red (2.5YR 4/6) and yellowish brown (10YR 5/4) mottles; moderate fine subangular blocky structure; very firm; few fine roots; patchy clay films on faces of peds; strongly acid; clear smooth boundary.

Btg2—42 to 66 inches; gray (10YR 6/1) clay; many medium prominent strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; very firm; few fine roots; patchy clay films on faces of peds; strongly acid.

Thickness of the solum is more than 60 inches. These soils are extremely acid or strongly acid except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. In some pedons, it is mottled in shades of brown. The A horizon is loam or fine sandy loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8; or it is mottled in shades of gray, brown, and red. The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is mottled in shades of brown and red. The Bt horizon and Btg horizon are clay loam, clay, or silty clay.

Lucedale Series

The Lucedale series consists of deep, well drained, moderately permeable soils on uplands in the central and southern part of the county. They formed in loamy marine and fluvial sediments. Slopes range from 0 to 5 percent.

Lucedale soils are associated with Bama, Grady, and Malbis soils. Bama and Lucedale soils are on similar elevations. Bama soils have a red argillic horizon, and Malbis soils have a yellow argillic horizon, more than 5 percent plinthite, and are moderately well drained. Grady soils are in depressions and are more poorly drained.

Typical pedon of Lucedale loam, 0 to 1 percent slopes; in a pecan orchard; 1,250 feet south and 1,300 feet east of the northwest corner of sec. 12, T. 4 N., R. 5 E.

Ap—0 to 8 inches; dark brown (7.5YR 3/2) loam; moderate medium granular structure; friable; common fine pores; strongly acid; abrupt smooth boundary.

Bt1—8 to 16 inches; reddish brown (5YR 4/4) loam; common fine distinct dark brown (7.5YR 3/2) mottles; weak medium subangular blocky structure; common fine roots; few fine pores; dark brown mottles are Ap material mixed by roots and worms; strongly acid; clear wavy boundary.

Bt2—16 to 28 inches; dark red (2.5YR 3/6) clay loam; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine roots; common fine pores; strongly acid; gradual wavy boundary.

Bt3—28 to 42 inches; dark red (2.5YR 3/6) clay loam; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine roots; few medium pores; few uncoated sand grains; strongly acid; gradual wavy boundary.

Bt4—42 to 68 inches; dark red (2.5YR 3/6) sandy clay loam; weak coarse subangular blocky structure parting to moderate medium subangular blocky; friable; thin broken clay films on faces of peds; few fine roots; few medium pores; few uncoated sand grains; very strongly acid.

Thickness of the solum is more than 72 inches.

The A horizon has hue of 10R, 5YR, or 7.5YR, value of 3, and chroma of 2 to 4. It is sandy loam, fine sandy loam, or loam. The A horizon is strongly acid to slightly acid except where it has been limed.

In some pedons, a sandy loam or loam BA horizon is from 3 to 10 inches thick. Color and reaction are similar to those of the Bt horizon.

The Bt horizon has hue of 2.5YR, 5YR, or 10R, value of 3 or 4, and chroma of 4 to 6. It is sandy clay loam, clay loam, or loam. The Bt horizon is very strongly acid or strongly acid.

Lucy Series

The Lucy series consists of deep, well drained, moderately permeable soils on uplands in the central and southern part of the county. They formed in thick, sandy and loamy marine and fluvial sediment. Slopes range from 1 to 25 percent.

Lucy soils are associated with Bama, Malbis, Saffell, and Troup soils. Bama soils are on similar or slightly higher elevations and do not have a sandy epipedon as thick as 20 inches. Saffell soils are on similar elevations or adjacent hill slopes and are gravelly throughout. Troup soils are on similar elevations but have a sandy epipedon more than 40 inches thick. Malbis soils are on similar or less sloping elevations and have a yellow argillic horizon that is more than 5 percent plinthite.

Typical pedon of Lucy loamy sand, 1 to 5 percent slopes; in a wooded area about 3 miles south of Palmers Crossroads; 2,500 feet north and 2,000 feet west of the southeast corner of sec. 2, T. 3 N., R. 5 E.

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

E—7 to 25 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable;

common fine and medium roots; strongly acid; gradual wavy boundary.
BE—25 to 34 inches; strong brown (7.5YR 5/6) sandy loam; weak fine subangular blocky structure; friable; few fine roots; strongly acid; clear smooth boundary.
Bt1—34 to 47 inches; yellowish red (5YR 5/6) sandy clay loam; weak fine subangular blocky structure; few fine roots; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.
Bt2—47 to 66 inches; red (2.5YR 4/8) sandy clay loam; weak fine subangular blocky structure; few fine roots; thin patchy clay films on faces of peds; friable; strongly acid.

Thickness of the solum is more than 60 inches. These soils are strongly acid in the A and E horizons except where the surface layer has been limed and very strongly acid or strongly acid in the B horizon.

The A horizon plus the E horizon ranges from 20 to 40 inches thick. They are loamy sand or loamy fine sand. The A horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 or 3. The E horizon has hue of 10YR or 7.5YR, value of 4 to 7, and chroma of 3 to 8.

The BE horizon, if present, has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 6 to 8. It is sandy loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. In some pedons that do not have a BE horizon, the upper part of the Bt horizon has hue of 7.5YR, value of 4 or 5, and chroma of 6 to 8. The Bt horizon is dominantly sandy clay loam but includes sandy loam, fine sandy loam, or clay loam. Clay content of the control section averages between 20 and 30 percent.

Luverne Series

The Luverne series consists of deep, well drained, moderately slowly permeable soils on uplands in the northern part of the county. They formed in clayey marine sediments. Slopes range from 5 to 25 percent.

Luverne soils are associated with Arundel, Beatrice, and Halso soils. Arundel soils are on adjacent hill slopes and are moderately deep to bedrock. Beatrice and Halso soils are on similar or less sloping elevations and are moderately well drained and have more clay than Luverne soils.

Typical pedon of Luverne sandy loam, 5 to 10 percent slopes; in a forested area 5 miles northwest of Beatrice; 950 feet north and 1,250 feet west of the southeast corner of sec. 33, T. 10 N., R. 8 E.

Ap—0 to 4 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.
Bt1—4 to 16 inches; yellowish red (5YR 4/6) clay; moderate fine subangular blocky structure; firm; few fine roots; continuous distinct clay films on faces of peds; strongly acid; clear wavy boundary.
Bt2—16 to 26 inches; yellowish red (5YR 4/6) clay; few fine prominent yellowish brown mottles; friable; few fine roots; continuous distinct clay films on faces of peds; common medium prominent white (2.5Y 8/2) soft shale fragments; very strongly acid; clear smooth boundary.
C1—26 to 50 inches; stratified yellowish red (5YR 5/6), yellowish brown (10YR 5/6), and gray (10YR 6/1) sandy clay loam and sandy loam interbedded with thin layers of light brownish gray (2.5Y 6/2) clayey shale; very strongly acid; gradual smooth boundary.
C2—50 to 72 inches; thin layers of soft light brownish gray (2.5Y 6/2) clayey shale interbedded with red and brown sandy materials.

Thickness of the solum ranges from 20 to 50 inches, and depth to hard bedrock is more than 60 inches. These soils range from strongly acid to extremely acid. Some pedons contain a few ironstone fragments.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma 2 to 4. It is sandy loam, fine sandy loam, or loamy sand.

The Bt horizon has hue of 5YR, 2.5YR, or 10R, value of 3 to 5, and chroma of 4 to 8. It is clay loam, sandy clay, or clay. The clay content of the control section ranges from 35 to 60 percent, and the silt content is less than 30 percent.

The BC horizon, if present, has colors similar to those of the Bt horizon. It is clay loam or sandy clay loam.

The C horizon is stratified marine sediments. It ranges from loamy sand to clay. Thickness of strata ranges from a few millimeters to several centimeters or more. Colors are variable but generally the sandier textured strata has hue of 2.5YR, 5YR, or 7.5YR, value of 4 to 6, and chroma of 5 to 8. Clayey strata are generally gray. In some pedons, thin lenses of ironstone are in the upper part of the C horizon.

Malbis Series

The Malbis series consists of deep, moderately well drained, moderately slowly permeable soils on uplands in the southern and western part of the county. They formed in loamy marine and fluvial sediments. Slopes range from 0 to 8 percent.

Malbis soils are associated with Atmore, Bama, Escambia, Grady, Lucedale, and Poarch soils. Atmore, Escambia, and Grady soils are on lower elevations and are more poorly drained than Malbis soils. Bama and Lucedale soils are on similar or slightly higher elevations and are better drained. Poarch soils are on similar elevations but have an argillic horizon that has less clay.

Typical pedon of Malbis loam, 0 to 1 percent slopes; in a wooded area about 0.3 miles northwest of Palmers

Crossroads; 50 feet south and 2,640 feet west of the northeast corner of sec. 22, T. 4 N., R. 5 E.

A—0 to 9 inches; very dark grayish brown (10YR 3/2) loam; weak medium granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

Bt1—9 to 19 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; common fine roots; few fine pores; very strongly acid; clear wavy boundary.

Bt2—19 to 33 inches; yellowish brown (10YR 5/6) clay loam; weak medium subangular blocky structure; friable; few fine roots; few fine pores; about 2 percent by volume nodular plinthite; very strongly acid; clear wavy boundary.

Btv1—33 to 43 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct strong brown (7.5YR 5/6) and light yellowish brown (10YR 6/4) mottles; weak coarse angular blocky structure parting to moderate medium subangular blocky; friable; slightly brittle and compact; few fine roots; common fine and medium pores; about 17 percent by volume nodular plinthite; very strongly acid; clear smooth boundary.

Btv2—43 to 73 inches; reticulately mottled yellowish brown (10YR 5/6), yellowish red (5YR 5/6), and light gray (10YR7/1) clay loam; weak thick platy structure parting to moderate medium subangular; firm, brittle, and compact; few fine roots; common medium pores; about 8 percent by volume nodular plinthite; strongly acid; gradual wavy boundary.

Thickness of the solum is more than 60 inches. Depth to a horizon that has 5 percent or more plinthite ranges from 24 to 40 inches.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 or 3. Some pedons have a yellowish brown or light yellowish brown E horizon that is as much as 4 inches thick. The A and E horizons are sandy loam, fine sandy loam, or loam and are very strongly acid to medium acid.

The BA or BE horizon, if present, and the Bt horizon have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. They are loam, sandy clay loam, or clay loam. The BA or BE horizon and the Bt horizon are very strongly acid or strongly acid.

The Btv horizon has colors similar to the Bt horizon but includes hue of 10YR, value of 6, and chroma of 6 to 8 and mottles in shades of brown, yellow, or red. Nodules of Plinthite range from 5 to 25 percent by volume. The Btv horizon is very strongly acid or strongly acid.

Mantachie Series

The Mantachie series consists of deep, somewhat poorly drained, moderately permeable soils on alluvial flood plains in the northern part of the county. They formed in loamy alluvial and fluvial sediments. Slopes range from 0 to 2 percent.

Mantachie soils are associated with Iuka soils. Iuka soils are on slightly higher elevations and are better drained.

Typical pedon of Mantachie loam in an wooded area of Iuka and Mantachie soils, 0 to 2 percent slopes, frequently flooded; about 0.2 mile south of Keith and 0.3 mile north of Big Flat Creek; 2,100 feet north and 250 feet east of the southwest corner of sec. 10, T. 8 N., R. 7 E.

A—0 to 3 inches; brown (10YR 5/3) loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak fine granular structure; friable; common fine roots; very strongly acid; clear smooth boundary.

Bw1—3 to 10 inches; brown (10YR 4/3) clay loam; common medium distinct pale brown (10YR 6/3) and light gray (10YR 6/1) mottles; weak fine granular and subangular blocky structure; firm; common fine roots; very strongly acid; clear wavy boundary.

Bw2—10 to 20 inches; mottled brown (10YR 5/3), yellowish brown (10YR 5/4), and light gray (10YR 6/1) clay loam; weak medium subangular blocky structure; firm; common fine roots; very strongly acid; gradual wavy boundary.

Bw3—20 to 33 inches; mottled yellowish brown (10YR 5/4) and light gray (10YR 6/1) clay loam; common medium distinct brown (10YR 4/3) mottles; weak medium subangular blocky structure; firm; very strongly acid; gradual wavy boundary.

Bg—33 to 66 inches; light gray (10YR 7/1) clay loam; many large distinct pale olive (5Y 6/3) mottles; weak coarse subangular blocky structure; firm; very strongly acid.

Thickness of the solum ranges from 30 inches to more than 60 inches. These soils are very strongly acid or strongly acid in the A and B horizons except where the surface layer has been limed. Some pedons have as much as 5 percent gravel by volume throughout the soil.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 6. It is fine sandy loam, loam, or silt loam.

The Bw horizon is mottled in shades of gray, brown, and yellow; or it has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 6. The Bw horizon is clay loam, loam, or sandy clay loam. The particle-size control section ranges from 18 to 34 percent clay content.

The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is clay loam, loam, or sandy clay loam.

The C horizon, if present, has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It is clay loam, loam, or sandy clay loam.

Poarch Series

The Poarch series consists of deep, moderately well drained, moderately slowly permeable soils on uplands of the Coastal Plain in the southern part of the county. They formed in loamy marine and fluvial sediments. Slopes range from 0 to 1 percent.

Poarch soils are associated with Atmore, Escambia, and Malbis soils. Atmore and Escambia soils are on similar elevations as Poarch soils and are more poorly drained. Malbis soils are on similar elevations as Poarch soils but have a fine-loamy argillic horizon.

Typical pedon of Poarch very fine sandy loam, 0 to 1 percent slopes; in a wooded area 1 mile east of Chrysler, 0.2 mile north of Alabama Highway 59, and 75 feet east of a gravel road; 950 feet north and 1,000 feet west of the southeast corner of sec. 17, T. 4 N., R. 4 E.

A—0 to 4 inches; dark gray (10YR 4/1) very fine sandy loam; weak medium granular structure; very friable; many roots; extremely acid; clear smooth boundary.

BE—4 to 11 inches; light yellowish brown (2.5Y 6/4) loam; weak medium subangular blocky structure; very friable; common roots; few iron-manganese concretions; sand grains coated and bridged with clay; very strongly acid; clear wavy boundary.

Bt1—11 to 25 inches; yellowish brown (10YR 5/4) loam; common distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few roots; few iron-manganese concretions; few plinthite nodules; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

Bt2—25 to 34 inches; yellowish brown (10YR 5/4) loam; common medium distinct strong brown (7.5YR 5/6) mottles and few medium distinct very pale brown (10YR 7/3) mottles; weak medium subangular blocky structure; friable, slightly compact in places; few roots; few iron-manganese concretions; about 3 percent by volume plinthite nodules; sand grains well coated and bridged with clay; few patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btv1—34 to 53 inches; yellowish brown (10YR 5/6) clay loam; many medium prominent red (2.5YR 4/6) and gray (10YR 6/1) mottles and many medium faint strong brown (7.5YR 5/6) mottles; moderate medium blocky structure; firm, compact, and brittle; few iron-manganese concretions; about 10 percent volume plinthite nodules; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btv2—53 to 72 inches; mottled yellowish brown (10YR 5/6), reddish brown (2.5YR 4/4), and gray (10YR 6/1) clay loam; moderate medium blocky structure; very firm and compact; about 10 percent by volume plinthite nodules; patchy clay films on faces of peds; very strongly acid.

Thickness of the solum is more than 60 inches. The soils are very strongly acid or strongly acid except where the surface layer has been limed. Depth to a horizon that has 5 percent or more plinthite ranges from 24 to 50 inches.

The A horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 1 to 3. The E horizon, if present, has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2 to 4. The A and E horizons are sandy loam, fine sandy loam, very fine sandy loam, or loam.

The BE horizon has hue of 10YR to 5Y, value of 5 or 6, and chroma of 2 or 4. This horizon is loam, very fine sandy loam, or fine sandy loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 8. This horizon is sandy loam, fine sandy loam, or loam.

The Btv horizon has colors similar to the Bt horizon, or it is mottled in shades of red, brown, yellow, or gray. Depth to mottles that have chroma of 2 or less is more than 30 inches. Plinthite is 5 to 25 percent of the volume. The Btv horizon is sandy loam, fine sandy loam, or loam, and it includes clay loam and sandy clay loam below a depth of about 40 inches.

Prim Series

The Prim series consists of shallow, well drained, moderately slowly permeable soils on hill slopes between uplands and the Alabama River terraces and flood plains. They formed in calcareous limestone. Slopes range from 4 to 15 percent.

Prim soils are associated with Bama, Greenville, and Saffell soils. These soils are on higher elevations than Prim soils and are deep to bedrock.

Typical pedon of Prim very cobbly loam, 4 to 15 percent slopes; in a forested area about 2.5 miles west of Perdue Hill; 2,350 feet north and 1,000 feet west of the southeast corner of sec. 2, T. 6 N., R. 5 E.

A—0 to 9 inches; very dark grayish brown (10YR 3/2) very cobbly loam; moderate fine granular structure; friable; many fine, medium, and coarse roots; 40 percent by volume limestone fragments 5 mm to 150 mm across; strong effervescense; moderately alkaline; clear wavy boundary.

Cr—9 to 60 inches; white (10YR 8/1) soft limestone; few fine distinct yellow (2.5Y 7/6) mottles; massive; few roots in cracks in the upper part can be cut with spade; strong effervescense; moderately alkaline.

Thickness of the soil over continuous soft limestone ranges from 4 to 19 inches. The limestone has a hardness of less than 3 on Mohs scale and can be dug with a spade. Limestone fragments cover 20 to 60 percent of the surface. They range from 50 mm to 450 mm across. The soil is calcareous throughout.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 2 or 3. Content of limestone fragments ranges from 35 to 70 percent by volume. The fragments range from 2 mm to 300 mm across. The A horizon is very cobbly loam, extremely cobbly loam, very cobbly clay loam, or extremely cobbly clay loam.

The C horizon, if present, has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. Content of limestone fragments ranges from 40 to 80 percent by volume. The fragments range from 2 mm to 350 mm across. The C horizon is very cobbly loam, very cobbly clay loam, extremely cobbly loam, or extremely cobbly clay loam.

The Cr horizon has hue of 10YR to 5Y, value of 5 to 8, and chroma of 1 or 2. At various depths, it is interbedded with layers of fragmented, harder limestone. These layers are more difficult to cut with a spade. The Cr horizon extends to a depth of 60 inches or more.

Saffell Series

The Saffell series consists of deep, well drained, moderately permeable soils on uplands and hill slopes throughout the county. They formed in gravelly, loamy fluvial sediments. Slopes range from 5 to 35 percent.

Saffell soils are associated with Bama and Lucy soils. Bama and Lucy soils are on similar or higher, less sloping elevations and have an argillic horizon that has less gravel than the Saffell soils.

Typical pedon of Saffell very gravelly sandy loam, 5 to 8 percent slopes; in a forested area about 0.5 mile north of the Monroe County courthouse in Monroeville; 20 feet north and 1,600 feet west of the southeast corner of sec. 26, T. 7 N., R. 7 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very gravelly sandy loam; weak fine granular structure; very friable; many roots; 55 percent by volume quartz pebbles 2 mm to 30 mm across; strongly acid; clear smooth boundary.

E—3 to 10 inches; brown (7.5YR 4/4) gravelly sandy loam; weak fine granular structure; very friable; 35 percent by volume quartz pebbles 2 mm to 30 mm across; strongly acid; clear smooth boundary.

Bt1—10 to 14 inches; yellowish red (5YR 4/8) very gravelly sandy loam; weak medium subangular blocky structure; friable; 55 percent by volume quartz pebbles 5 mm to 40 mm across; sand grains coated and bridged with clay; strongly acid; clear smooth boundary.

Bt2—14 to 40 inches; red (2.5YR 5/8) very gravelly sandy clay loam; weak medium subangular blocky structure; friable; 55 percent by volume quartz pebbles 5 mm to 40 mm across; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

C—40 to 60 inches; yellowish red (5YR 4/8) stratified very gravelly loamy sand, very gravelly sandy loam, and very gravelly sand; massive; loose; 55 percent by volume quartz pebbles 5 mm to 50 mm across; strongly acid.

Thickness of the solum ranges from 35 to 60 inches. These soils are very strongly acid or strongly acid except where the surface layer has been limed. Coarse fragments, dominantly 2 mm to 75 mm across, range from 15 to 60 percent by volume in the A and E horizons and from 35 to 65 percent in the B and C horizons.

The A and E horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. They are very gravelly sandy loam, gravelly sandy loam, or very gravelly loamy fine sand.

The BE horizon, if present, has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. It is very gravelly sandy loam or very gravelly fine sandy loam.

The Bt horizon and, if present, the BC horizon have hue of 5YR and 2.5YR, value of 4 or 5, and chroma of 6 to 8. They are very gravelly sandy loam or very gravelly sandy clay loam.

The C horizon has colors in shades of red, brown, and yellow. It is very gravelly loamy sand or very gravelly sandy loam; or it is stratified very gravelly loamy sand, very gravelly sandy loam, and very gravelly sand.

Smithton Series

The Smithton series consists of deep, poorly drained, moderately slowly permeable soils on terraces of the Alabama River and its tributaries. They formed in loamy alluvial and fluvial sediments. Slopes range from 0 to 2 percent.

Smithton soils are associated with Bigbee, Cahaba, Izagora, and Stough soils. These soils are on higher elevations and are better drained than Smithton soils.

Typical pedon of Smithton sandy loam, 0 to 1 percent slopes, occasionally flooded; in a forested area about 1.5 miles northwest of Chrysler; 250 feet north and 2,400 feet east of the southwest corner of sec. 7, T. 4 N., R. 4 E.

A—0 to 5 inches; dark grayish brown (10YR 4/2) sandy loam; many medium distinct light gray (10YR 7/1) mottles; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

Btg1—5 to 42 inches; gray (10YR 6/1) sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; very friable; few slightly brittle peds; common fine and large roots; common fine and medium pores;

few small manganese concretions; about 1 percent by volume quartz pebbles 2 mm to 10 mm across; sand grains coated and bridged; very strongly acid; gradual wavy boundary.

Btg2—42 to 55 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/6) sandy clay loam; few medium prominent red (2.5YR 4/6) mottles; weak fine subangular blocky structure; firm; few thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—55 to 72 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/6) clay loam; few medium prominent red (2.5YR 4/6) mottles; weak fine subangular blocky structure; firm; few thin patchy clay films on faces of peds; very strongly acid.

Thickness of the solum is more than 60 inches. These soils are very strongly acid or strongly acid throughout except where the surface layer has been limed. Rounded or subrounded quartz gravel range from 0 to 5 percent by volume throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is loam, fine sandy loam, or sandy loam.

The E horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is loam, fine sandy loam, or sandy loam.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2 and has mottles in shades of brown or yellow; or it is mottled in shades of gray, brown, or yellow. It is loam, fine sandy loam, sandy loam, sandy clay loam, or clay loam.

Stough Series

The Stough series consists of deep, somewhat poorly drained, moderately slowly permeable soils on terraces of the Alabama River and its tributaries. They formed in loamy alluvial and fluvial deposits. Slopes range from 0 to 2 percent.

Stough soils are associated with Bigbee, Cahaba, Izagora, and Smithton soils. Bigbee, Cahaba, and Izagora soils are on higher elevations and are better drained than Stough soils. Smithton soils are on lower elevations and are more poorly drained.

Typical pedon of Stough sandy loam, 0 to 1 percent slopes; in a forested area about 1 mile west of Chrysler; 500 feet north and 50 feet west of the southeast corner of sec. 13, T. 4 N., R. 3 E.

A—0 to 6 inches; very dark gray (10YR 3/1) sandy loam; weak fine granular structure; very friable; many medium roots; strongly acid; clear smooth boundary.

E—6 to 10 inches; pale brown (10YR 6/3) sandy loam; weak fine granular structure; friable; few fine roots; strongly acid; clear smooth boundary.

Bt/E—10 to 16 inches; 80 percent by volume light yellowish brown (10YR 6/4) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; 20 percent by volume light brownish gray (10YR 6/2) sandy loam, weak medium granular structure; friable; strongly acid; gradual wavy boundary.

Bt1—16 to 25 inches; light yellowish brown (10YR 6/4) sandy loam; common medium faint light gray (10YR 7/2) and brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Bt2—25 to 32 inches; light yellowish brown (10YR 6/4) sandy loam; many medium distinct light gray (10YR 7/1) mottles and many medium faint brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Btx1—32 to 40 inches; mottled light yellowish brown (10YR 6/4), light gray (10YR 7/1), and brownish yellow (10YR 6/6) sandy clay loam; weak medium subangular blocky structure; friable; about 45 percent by volume brittle and compact; strongly acid; gradual wavy boundary.

Btx2—40 to 67 inches; mottled light yellowish brown (10YR 6/4), light grey (10YR 7/1), brownish yellow (10YR 6/6), and light red (2.5YR 6/6) sandy clay loam; weak medium subangular blocky structure; about 50 percent by volume brittle and compact; strongly acid.

Thickness of the solum is more than 60 inches. These soils are very strongly acid or strongly acid except where the surface layer has been limed.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 3. It is sandy loam, fine sandy loam, or loam.

The E horizon and the E part of the Bt/E horizon, if present, have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. They are sandy loam, fine sandy loam, or loam.

The Bt horizon and the Bt part of the Bt/E horizon have hue of 10YR, value of 5 or 6, and chroma of 4 to 8 and have mottles that have chroma of 2 or less in the lower part of the horizon. They are sandy loam, fine sandy loam, or loam.

The Btx horizon is mottled in shades of brown, yellow, gray, and red. It is sandy loam, sandy clay loam, or loam. The Btx horizon is 40 to 55 percent by volume brittle and compact.

Troup Series

The Troup series consists of deep, well drained, moderately permeable soils on uplands and hill slopes in the southern and central part of the county. They formed

in sandy and loamy marine and fluvial sediments. Slopes range from 3 to 25 percent.

Troup soils are associated with Bama, Lucedale, and Lucy soils. Bama and Lucedale soils are on higher elevations than Troup soils and do not have a sandy epipedon 20 inches thick. Lucy soils are on similar elevations as Troup soils but do not have a sandy epipedon 40 inches thick.

Typical pedon of Troup loamy sand in an area of Lucy-Troup loamy sands, 8 to 25 percent slopes; in a forested area about 0.5 mile southeast of old Scotland Church; 2,100 feet north and 200 feet west of the southeast corner of sec. 15, T. 8 N., R. 8 E.

Ap—0 to 7 inches; brown (10YR 5/3) loamy sand; single grained; loose; few fine roots; strongly acid; clear smooth boundary.
E1—7 to 20 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; loose; about 5 percent by volume pale brown (10YR 6/3) uncoated sand grains; strongly acid; gradual wavy boundary.
E2—20 to 33 inches; strong brown (7.5YR 5/8) loamy sand; weak medium granular structure; loose; few fine roots; strongly acid; gradual wavy boundary.
E3—33 to 54 inches; reddish yellow (7.5YR 6/6) loamy sand; weak fine granular structure; loose; 5 percent by volume pink (7.5YR 8/4) uncoated sand grains; strongly acid; clear wavy boundary.
Bt1—54 to 60 inches; strong brown (7.5YR 5/6) sandy loam; weak fine subangular blocky structure; very friable; sand grains coated and bridged with clay; strongly acid; clear smooth boundary.
Bt2—60 to 72 inches; yellowish red (5YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable; thin patchy clay films on faces of peds; clay coatings on sand grains; strongly acid.

Thickness of the solum is more than 80 inches. The A and E horizons are very strongly acid to medium acid except where the surface layer has been limed and are very strongly acid or strongly acid in the B horizon. Thickness of the A and E horizons ranges from 40 to 70 inches.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 2 to 4. It is loamy sand or loamy fine sand.

The E horizon has hue of 5YR to 10YR, value of 5 to 8, and chroma of 4 to 8. It is loamy sand or loamy fine sand. Most pedons have few to common uncoated sand grains.

The BE horizon, if present, has hue of 5YR to 10YR, value of 5 to 7, and chroma of 4 to 8. It is sandy loam or fine sandy loam.

The Bt horizon has hue of 10R to 5YR, value of 4 to 7, and chroma of 4 to 8. In some pedons, the Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The Bt horizon is sandy loam, fine sandy loam, or sandy clay loam.

The C or BC horizon, if present, is mottled or red sandy or loamy material.

Una Series

The Una series consists of deep, poorly drained, very slowly permeable soils in sloughs and depressed areas on flood plains of the Alabama River and its tributaries. They formed in clayey alluvial and fluvial sediments. Slopes range from 0 to 1 percent.

Una soils are associated with Congaree, Chrysler, Lenoir, and Urbo soils. These soils are on higher elevations and are better drained than Una soils.

Typical pedon of Una silty clay loam, 0 to 1 percent slopes, ponded; in a water tupelo and cypress tree swamp on the Alabama River flood plain about 5 miles. west of Perdue Hill; 900 feet south and 200 feet west of the northeast corner of sec. 8, T. 6 N., R. 5 E.

Ag—0 to 2 inches; gray (10YR 5/1) silty clay loam; many medium prominent brown (7.5YR 4/4) mottles; weak medium granular structure; firm and sticky; many fine, medium, and coarse roots; strongly acid; clear smooth boundary.
Bg1—2 to 10 inches; light gray (10YR 6/1) silty clay loam, many medium prominent yellowish red (5YR 4/6) mottles and common fine prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; firm and sticky; common fine and medium roots; very strongly acid; gradual smooth boundary.
Bg2—10 to 20 inches; gray (N 5/0) silty clay; few medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; very firm and very sticky; few fine, medium, and coarse roots; strongly acid; gradual smooth boundary.
Bg3—20 to 72 inches; gray (N 6/0) silty clay, common medium prominent yellowish brown (10YR 5/6) mottles and few fine prominent strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; very firm and very sticky; few fine, medium, and coarse roots; strongly acid.

Thickness of the solum is 60 inches or more. These soils are very strongly acid or strongly acid.

The Ag horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is silty clay loam or silty clay.

The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or less. It is silty clay loam, silty clay, or clay.

Urbo Series

The Urbo series consists of deep, somewhat poorly drained, very slowly permeable soils on flood plains of

the Alabama River. They formed in clayey alluvial and fluvial sediments. Slopes range from 0 to 3 percent.

Urbo soils are associated with Congaree, Chrysler, Lenoir, and Una soils. Congaree and Chrysler soils are on higher elevations and are better drained than Urbo soils. Lenoir soils are on similar elevations as Urbo soils but are not as frequently flooded and have an argillic horizon. Una soils are on lower elevations and are more poorly drained than Urbo soils.

Typical pedon of Urbo silty clay loam, 0 to 1 percent slopes, frequently flooded; in a wooded area about 5 miles west of Perdue Hill; 1,200 feet south and 500 feet east of the northwest corner of sec. 9, T. 6 N., R. 5 E.

A1—0 to 2 inches; dark brown (10YR 3/3) silty clay loam; moderate medium granular structure; firm; few fine roots; strongly acid; clear smooth boundary.

A2—2 to 6 inches; brown (10YR 4/3) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; weak medium granular structure; firm; few fine roots; strongly acid; clear smooth boundary.

Bw1—6 to 16 inches; brown (10YR 4/3) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; weak fine subangular blocky structure; firm; few fine roots; pale brown (10YR 6/3) silt coatings on faces of peds; strongly acid; gradual wavy boundary.

Bg1—16 to 25 inches; mottled brown (10YR 5/3), light brownish gray (10YR 6/2), and light gray (10YR 7/1) silty clay; weak fine subangular blocky structure; firm; few fine roots; strongly acid; gradual wavy boundary.

Bg2—25 to 66 inches; light gray (10YR 7/1) silty clay; many medium, distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; very firm; few fine roots; strong brown (7.5YR 5/6) soft iron stains and coatings; strongly acid.

Thickness of the solum is 60 inches or more. These soils are very strongly acid or strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 or 3. It is silty clay or silt loam.

The Bw horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is silty clay loam, clay loam, or silty clay.

The Bg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2; or it is mottled in shades of gray and brown. The Bg horizon is silty clay loam or silty clay.

Formation of the Soils

The main processes involved in the formation of soil horizons are accumulation of organic matter, leaching of calcium carbonate and bases, reduction and transfer of iron, and formation and translocation of silicate clay minerals. These processes can occur in combination or individually, depending on the integration of the factors of soil formation.

Most soils have four main horizons: A, E, B, and C. The A horizon is the surface layer. It is the horizon of maximum accumulation of organic matter. Organic matter has accumulated in the surface layer of all soils in the county to form the A horizon. The content of organic matter varies in different soils because of differences in relief, wetness, and inherent fertility. The E horizon is the subsurface layer. It is the horizon of maximum loss of soluble or suspended material. Stough soils have both an A horizon and an E horizon. Lucedale soils have an A horizon but do not have an E horizon.

The B horizon is the subsoil. It lies immediately below the A or E horizon and is the horizon of maximum accumulation of dissolved or suspended materials, such as organic matter, iron, or clay. In very young soils, such as Congaree soils, the B horizon has not yet developed.

The C horizon is the substratum. It has been affected very little by soil forming processes, but it may be somewhat modified by weathering.

Gleying is the chemical reduction and transfer of iron. It is evident in the wet soils of the county. Gleying is indicated by gray in the subsoil and gray mottles in other horizons. Some horizons have reddish brown mottles and concretions. This indicates a segregation of iron. Poarch soils have reddish brown mottles and concretions in the Btv2 horizon.

Leaching of carbonates and bases has occurred in most of the soils of the county. This contributes to the development of the horizons and to the low fertility and acid reaction of these soils.

In uniform materials, the difference in natural soil drainage generally is closely associated with slope or relief. Soil drainage gently affects the color and natural drainage of the soil. Soils, such as Bama soils, that formed under good drainage conditions have a subsoil that is uniformly bright in color. Soils that formed under poor drainage conditions, such as Atmore soils, are grayish. In soils that formed where drainage is intermediate, such as Escambia and Stough soils, the subsoil is mottled in shades of gray and brown. The grayish color persists even after the soils are artificially drained.

In areas of steep soils, geological erosion removes the surface layer. In low-lying or depressional areas, soil material accumulates and adds to the thickness of the surface layer. In other areas, the formation of soil material and rate of removal are in equilibrium with the soil development. Relief also relates to the elevation of clay from the E horizon and to the Bt horizon.

Factors of Soil Formation

In this section, the major factors and processes of the formation and morphology of the soils of Monroe County are described. Soil, as used in this discussion, is a natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effects of climate and living matter acting on earthy parent material as conditioned by relief over periods of time.

Soils are formed through the interaction of five major factors. These factors are climate, plant and animal life, parent material, relief, and time. The relative influence of each factor varies from place to place, and, in some places, one factor dominates in the formation of a soil and determines most of its properties.

Climate

Climate influences the variety of plants and largely determines the type of weathering that takes place. The warm, humid climate of Monroe County has favored strong weathering and rapid leaching of the soils. Almost all of the soils are acid. Because of weathering and leaching, the natural level of plant nutrients is low in most of the soils.

Soil temperatures vary somewhat throughout the county. Temperature influences the rate of physical and chemical reactions in the soil. The well drained Cahaba and Congaree soils on terraces of the Alabama River are slightly warmer than the soils in the remainder of the county. The Arundel soils on north- and east-facing slopes at the highest elevations are cooler. More detailed information on climate is available in the section, "General Nature of the Survey Area."

Plant and Animal Life

Trees, grasses, rodents, earthworms, micro-organisms, and other forms of plant and animal life are important factors in soil formation. Climate and relief acting on parent material throughout a period of time affect the degree to which plant and animal life contribute to soil formation. If the effects of climate and relief are favorable, plants and animals can grow.

As a result of root penetration into the soil, water and air can move into the soil more rapidly. This improves soil structure and contributes to more chemical reactions. Roots also help to recycle needed plant nutrients. Bases are returned to the surface and are not lost into the ground water by leaching if there are sufficient roots to take the bases up as they pass through the soil. The coarser textured soils, such as Bigbee, Troup, Lucy, and Saffell soils, generally have sparse vegetation in wooded areas, and leaching has removed all but trace amounts of soluble bases from these soils. Grasses reduce leaching and recycle calcium more efficiently than trees. Most of the soils in Monroe County formed under forest vegetation. As a result, soils, such as Escambia soils, developed a light colored surface layer. Prim soils have a darker surface layer that was influenced by the presence of grasses during the formation of these soils.

Most animal life in the soil is in the surface layer. Earthworms and rodents continuously mix the soil. This helps water infiltration, which in turn helps chemical weathering. Micro-organisms, such as fungi and bacteria, help the weathering of the parent material, which affects the amount of minerals in the soil. They also help to break down organic matter and to return organic acids and inorganic acids as plant nutrients into the soil. These nutrients are then used by the plants, or they are leached out of the soil.

Parent Material

Parent material is the unconsolidated mass from which a soil forms. It influences the mineral and chemical composition of the soil and, to a large extent, the rate at which soil formation takes place. Most of the parent material of Monroe County consists of water-deposited sediments. Textures of the material vary and are related to the energy of the water at the time of deposition. Congaree soils are young, medium textured soils that have been recently deposited by water from the Alabama River. Urbo soils are fine textured soils that were deposited in slack water areas. Some of the soils in Monroe County formed mainly in residuum. Prim soils formed in weathered limestone.

Relief

Relief influences soil formation. It controls surface drainage and affects the percolation of water through the soil. Relief affects the depth of the soil, the plant and animal life, and some of the soil-forming processes. Soils on steeper slopes, such as Arundel soils, are more subject to erosion because of concentrated, rapid runoff. These soils generally are not as deep as other soils. Soils, such as Atmore and Grady soils, in depressional areas are generally wet; and soils, such as Bama and Lucedale soils, on higher convex surfaces are better drained. Differences in relief cause free water to leave drained soils and to accumulate in the poorly drained soils.

The relief, or shape of the landscape, in Monroe County ranges from level to steep. Elevations range from about 20 feet above sea level in the southwest part of the county near the Alabama River to about 580 feet in the northeast part near Midway. Much of the nearly level and gently sloping relief is on flood plains and terraces and on the Citronelle Formation south of Monroeville. The Citronelle Formation is flat to gently rolling and the elevation ranges from about 420 feet at Ollie to about 360 feet at Vocation in the southeast part of the county. Other areas that have relatively smooth ridgetops are located west of the Citronelle Formation and parallel to the Alabama River. The recent Alabama River alluvium is about 50 feet in elevation at the Wilcox County line, north of Monroe Country, and is about 20 feet at the Baldwin County line, south of Monroe County. All the upland soil formations are losing elevation from north to south except the Chrysler soils on terraces between the uplands and the flood plain of the Alabama River. The Chrysler soils peak at about 75 feet both north and south. This indicates some possible lacustrine influence during the time of deposit.

Except for some of the gently sloping, clayey soils in the northern part of Monroe County, most of the soils are highly dissected with narrow ridges and sloping to moderately steep side slopes. The gently sloping and sloping, clayey Beatrice, Halso, and Luverne soils in the northern part of the county are bounded on three sides by the moderately steep Arundel soil on the Tallahatta Formation. The formation is about 150 to 200 feet higher in elevation than the Beatrice, Halso, and Luverne soils. Big Flat Creek cuts through the southwest part of the Tallahatta Formation and drains the Beatrice and Luverne soils in this basin.

Time

Time is required for parent material to be changed into soil. The change takes place slowly. Soils that formed in similar parent material can differ in maturity. Maturity of a soil determines the degree of profile development. Immature soils have little or no evidence of profile

development. Mature soils have well developed horizons. Congaree and Lucedale soils formed in loamy material. Congaree soils on terraces are younger than Lucedale soils. They are still accumulating material deposited by flood water and do not have well developed horizons. Lucedale soils on uplands are mature. The time since deposition has been long enough to develop a well defined profile.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well-aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
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.

Bedding planes. Fine stratifications, less than 5 mm thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

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 mm in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 mm to 25 cm (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 cm (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). The volume of soft soil decreases excessively under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—
Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

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.

Deferred grazing. Postponing grazing or resting grazingland for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of 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.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The movement of water into the soil is rapid.

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.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Fragile (in tables). The soil is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 mm to 7.5 cm) 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.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

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 upper case letter represents the major horizons. Numbers or lower case 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.

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.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Large stones (in tables). Rock fragments that are 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

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 mm (about 0.2 inch); *medium*, from 5 to 15 mm (about 0.2 to 0.6 inch); and *coarse*, more than 15 mm (about 0.6 inch).

Munsell notation. A designation of color by degrees of the 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.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). 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 of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). In these areas, surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

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 degree of acidity or alkalinity is expressed as—

	pH
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.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that

accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 mm or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). There is a shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 mm to 2.0 mm in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

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 underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 mm) to the lower limit of very fine sand (0.05 mm). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slippage (in tables). The soil mass is susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 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.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

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.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). An excessive amount of toxic substances in the soil, such as sodium or sulfur, severely hinders the establishment of vegetation or severely restricts plant growth.

Trace elements. Chemical elements, such as zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

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.

Well graded. Refers to soil material consisting of course grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. This contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Data were recorded in the period 1951-80 at Frisco City, Alabama]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	58.6	36.5	47.6	79	13	130	5.06	3.26	6.68	8	.3
February---	62.6	38.6	50.5	81	18	153	4.98	2.69	6.98	7	.2
March------	69.6	45.6	57.6	85	25	266	6.22	3.31	8.77	8	.0
April------	78.3	53.7	66.0	89	35	480	5.43	2.19	8.16	6	.0
May--------	84.9	61.1	73.0	96	44	713	4.85	1.46	7.59	6	.0
June-------	90.4	67.0	78.7	100	54	861	4.97	2.40	7.18	8	.0
July-------	91.6	69.6	80.6	100	62	949	6.18	3.78	8.34	10	.0
August-----	91.4	69.1	80.3	99	59	939	4.58	2.21	6.62	8	.0
September--	87.8	65.3	76.6	98	49	798	4.97	2.31	7.25	7	.0
October----	79.0	53.3	66.2	92	33	502	2.92	.42	4.80	4	.0
November---	68.5	43.7	56.1	85	22	208	3.68	2.01	5.15	5	.0
December---	61.5	38.6	50.1	79	16	119	5.43	2.94	7.62	7	.0
Yearly:											
Average--	77.0	53.5	65.3	---	---	---	---	---	---	---	---
Extreme--	---	---	---	102	12	---	---	---	---	---	---
Total----	---	---	---	---	---	6,118	59.27	49.22	68.53	84	.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 °F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data were recorded in the period 1951-80 at Frisco City, Alabama]

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--	March 8	March 23	April 4
2 years in 10 later than--	February 25	March 14	March 29
5 years in 10 later than--	February 5	February 24	March 17
First freezing temperature in fall:			
1 year in 10 earlier than--	November 14	November 4	October 27
2 years in 10 earlier than--	November 21	November 11	November 2
5 years in 10 earlier than--	December 5	November 25	November 11

TABLE 3.--GROWING SEASON

[Data were recorded in the period 1951-80 at Frisco City, Alabama]

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	265	237	217
8 years in 10	278	250	224
5 years in 10	302	273	239
2 years in 10	328	297	253
1 year in 10	344	309	261

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP FOR MAJOR LAND USES

General soil map unit	Extent of area (percent)	Cultivated farm crops	Pasture	Woodland	Urban uses	Intensive recreation areas	Extensive recreation areas
1. Lucedale-Malbis-Escambia	10	Suited----------	Suited---------	Suited----------	Fair: wetness.	Suited--------	Suited.
2. Malbis-Bama	7	Suited----------	Suited---------	Suited----------	Suited----------	Suited--------	Suited.
3. Saffell-Bama-Bibb	30	Fair to poor: slope, wetness, small stones.	Fair to poor: slope, wetness, small stones.	Suited to fair: slope, wetness, small stones.	Fair to poor: slope, wetness, stones.	Fair to poor: slope, wetness, small stones.	Suited.
4. Saffell-Lucy-Greenville	12	Fair to poor: slope, small stones.	Suited to fair: slope.	Fair to suited: slope.	Fair to poor: slope.	Fair to poor: slope, small stones.	Suited.
5. Luverne-Beatrice-Halso	17	Poor: slope, depth to rock.	Suited---------	Fair: too clayey.	Poor: Low strength*, shrink-swell.	Fair: slope, percs slowly.	Fair: too clayey.
6. Arundel-Luverne	6	Poor: slope, depth to rock.	Poor: depth to rock.	Suited to fair: slope.	Poor: Slope, low strength*, shrink-swell, percs slowly.	Poor: percs slowly, slope.	Fair to poor: slope, too clayey.
7. Iuka-Mantachie	8	Poor: wetness, floods.	Suited---------	Suited----------	Poor: wetness, floods.	Poor: wetness, floods.	Fair: wetness, floods.
8. Urbo-Chrysler-Congaree	10	Fair to poor: wetness, floods.	Suited---------	Suited----------	Poor: wetness, floods.	Poor: wetness, floods.	Fair: wetness, floods.

* Low strength is a limitation only to local roads and streets and to roadfill.

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
ArF	Arundel loam, 8 to 35 percent slopes	32,600	5.0
AtA	Atmore silt loam, 0 to 1 percent slopes	3,200	0.5
BaB	Bama sandy loam, 1 to 5 percent slopes	31,400	4.8
BaC	Bama sandy loam, 5 to 10 percent slopes	25,900	4.0
BbC	Bama-Urban land complex, 1 to 10 percent slopes	2,700	0.4
BeB	Beatrice silt loam, 1 to 5 percent slopes	5,300	0.8
BeC	Beatrice silt loam, 5 to 10 percent slopes	25,300	3.9
BnB	Benndale sandy loam, 1 to 5 percent slopes	2,140	0.3
BrA	Bibb loam, 0 to 1 percent slopes, frequently flooded	38,400	5.9
BsB	Bigbee sand, 0 to 5 percent slopes, occasionally flooded	1,120	0.2
CaA	Cahaba sandy loam, 0 to 2 percent slopes, occasionally flooded	3,860	0.6
ChB	Chrysler silt loam, 0 to 5 percent slopes,occasionally flooded	11,500	1.8
CnB	Congaree loam, 0 to 4 percent slopes, occasionally flooded	7,000	1.1
EcA	Escambia very fine sandy loam, 0 to 1 percent slopes	7,230	1.1
EsC	Esto sandy loam, 3 to 10 percent slopes	815	0.1
GdA	Grady loam, 0 to 2 percent slopes	2,560	0.4
GrB	Greenville sandy loam, 2 to 5 percent slopes	4,460	0.7
GrC	Greenville sandy loam, 5 to 8 percent slopes	6,350	1.0
HaB	Halso sandy loam, 1 to 5 percent slopes	3,300	0.4
HaC	Halso sandy loam, 5 to 10 percent slopes	7,200	1.1
ImA	Iuka and Mantachie soils, 0 to 2 percent slopes, frequently flooded	51,300	7.9
IrB	Izagora fine sandy loam, 0 to 4 percent slopes, occasionally flooded	4,250	0.7
LaA	Lenoir loam, 0 to 2 percent slopes, frequently flooded	6,740	1.0
LcA	Lucedale loam, 0 to 1 percent slopes	18,000	2.8
LcB	Lucedale fine sandy loam, 1 to 5 percent slopes	4,210	0.6
LnB	Lucy loamy sand, 1 to 5 percent slopes	4,140	0.6
LnC	Lucy loamy sand, 5 to 8 percent slopes	9,950	1.5
LtE	Lucy-Troup loamy sands, 8 to 25 percent slopes	9,320	1.4
LvC	Luverne sandy loam, 5 to 10 percent slopes	15,670	2.4
LvE	Luverne sandy loam, 10 to 25 percent slopes	46,900	7.2
MaA	Malbis loam, 0 to 1 percent slopes	19,100	2.9
MaB	Malbis fine sandy loam, 1 to 5 percent slopes	46,900	7.2
MaC	Malbis fine sandy loam, 5 to 8 percent slopes	8,300	1.3
PoA	Poarch very fine sandy loam, 0 to 1 percent slopes	4,830	0.7
PrD	Prim very cobbly loam, 4 to 15 percent slopes	2,600	0.4
SfC	Saffell very gravelly sandy loam, 5 to 8 percent slopes	4,500	0.7
SfD	Saffell very gravelly sandy loam, 8 to 15 percent slopes	42,200	6.5
SgF	Saffell-Lucy complex, 15 to 35 percent slopes	103,400	15.9
SmA	Smithton sandy loam, 0 to 1 percent slopes, occasionally flooded	1,290	0.2
StA	Stough sandy loam, 0 to 1 percent slopes	4,140	0.6
UdC	Udorthents, loamy, 0 to 8 percent slopes	480	0.1
UnA	Una silty clay loam, 0 to 1 percent slopes, ponded	2,680	0.4
UrA	Urbo silty clay loam, 0 to 1 percent slopes, frequently flooded	18,560	2.8
		500	0.1
	Total	652,295	100.0

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS ANT PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Corn	Soybeans	Grain sorghum	Cotton lint	Wheat	Improved bermudagrass	Bahiagrass
		Bu	Bu	Bu	Lbs	Bu	Tons	AUM*
ArF---------- Arundel	VIIe	---	---	---	---	---	---	---
AtA---------- Atmore	IVw	40	20	---	---	---	---	6.0
BaB---------- Bama	IIe	90	35	90	750	40	6.5	9.5
BaC---------- Bama	IIIe	70	30	80	650	30	6.0	9.0
BbC---------- Bama-Urban land	---	---	---	---	---	---	---	---
BeB---------- Beatrice	IIIe	50	30	40	500	---	4.0	6.5
BeC---------- Beatrice	IVe	---	---	---	---	---	3.5	5.0
BnB---------- Benndale	IIe	75	30	80	600	35	6.0	8.5
BrA---------- Bibb	Vw	---	---	---	---	---	---	---
BsB---------- Bigbee	IIIs	50	---	---	---	---	3.0	7.5
CaA---------- Cahaba	IIw	90	35	90	800	40	6.5	8.5
ChB---------- Chrysler	IIe	90	40	85	750	35	5.5	8.5
CnB---------- Congaree	IIw	125	45	110	800	45	6.5	9
EcA---------- Escambia	IIw	100	40	90	---	25	4.0	---
EsC---------- Esto	IVe	---	---	---	---	---	4.0	4.5
GdA---------- Grady	Vw	---	---	---	---	---	---	---
GrB---------- Greenville	IIe	95	35	90	800	40	6.5	9.0
GrC---------- Greenville	IIIe	85	25	70	700	35	6.0	8.5
HaB---------- Halso	IIIe	---	---	---	---	---	4.5	6.2

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Grain sorghum	Cotton lint	Wheat	Improved bermudagrass	Bahiagrass
		Bu	Bu	Bu	Lbs	Bu	Tons	AUM*
HaC--Halso	IVe	---	---	---	---	---	4.0	5.5
ImA--Iuka and Mantachie	Vw	---	---	---	---	---	3.0	7.3
IrB--Izagora	IIw	90	30	90	500	35	6.5	9.5
LaA--Lenoir	Vw	---	---	---	---	---	---	---
LcA--Lucedale	I	125	40	110	900	50	6.5	10.0
LcB--Lucy	IIe	110	35	90	800	40	6.5	10.0
LnB--Lucy	IIs	80	33	60	550	30	5.0	8.5
LnC--Lucy	IIIs	70	25	60	500	30	5.0	8.5
LtE:								
Lucy	VIs	---	---	---	---	---	---	6.0
Troup	VIIs	---	---	---	---	---	---	5.0
LvC--Luverne	IVe	70	40	65	600	30	4.0	8.0
LvE--Luverne	VIIe	---	---	---	---	---	---	---
MaA--Malbis	I	115	40	110	800	40	6.5	9.0
MaB--Malbis	IIe	95	37	90	750	35	6.0	8.5
MaC--Malbis	IIIe	80	30	70	650	30	5.5	8.0
PoA--Poarch	I	90	40	100	700	40	6.0	9.5
PrD--Prim	VIs	---	---	---	---	---	---	4.0
SfC--Saffell	IIIe	45	---	---	---	30	3.0	5.0
SfD--Saffell	IVe	---	---	---	---	---	2.5	4.5
SgF:								
Saffell	VIIe	---	---	---	---	---	---	---
Lucy	VIIs	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Grain sorghum	Cotton lint	Wheat	Improved bermudagrass	Bahiagrass
		Bu	Bu	Bu	Lbs	Bu	Tons	AUM*
SmA---------- Smithton	IVw	---	20	---	---	---	---	7.0
StA---------- Stough	IIw	80	25	90	---	25	4.0	8.0
UdC---------- Udorthents	VIs	---	---	---	---	---	---	---
UnA---------- Una	VIIw	---	---	---	---	---	---	---
UrA---------- Urbo	IVw	---	---	---	---	---	---	6.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 7.--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]

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
ArF---------- Arundel	3c	Moderate	Moderate	Moderate	Moderate	Loblolly pine-------	70	Loblolly pine.
						Shortleaf pine------	60	
AtA---------- Atmore	2w	Slight	Severe	Moderate	Severe	Loblolly pine-------	90	Loblolly pine, slash pine, sweetgum.
						Slash pine----------	90	
						Longleaf pine-------	72	
						Sweetgum------------	90	
BaB, BaC---------- Bama	2o	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	Loblolly pine, longleaf pine, slash pine.
						Slash pine----------	90	
						Longleaf pine-------	75	
BeB, BeC---------- Beatrice	2c	Slight	Moderate	Slight	Severe	Loblolly pine-------	89	Loblolly pine, water oak, sweetgum.
						Shortleaf pine------	80	
						Water oak-----------	90	
						Sweetgum------------	90	
BnB---------- Benndale	2o	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	Loblolly pine, slash pine, longleaf pine.
						Longleaf pine-------	75	
						Slash pine----------	90	
						Shortleaf pine------	80	
BrA---------- Bibb	2w	Slight	Severe	Severe	Severe	Loblolly pine-------	90	Eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
						Sweetgum------------	90	
						Water oak-----------	90	
						Blackgum------------	---	
BsB---------- Bigbee	2s	Slight	Moderate	Severe	Slight	Loblolly pine-------	86	Loblolly pine, longleaf pine.
						Longleaf pine-------	76	
CaA---------- Cahaba	2o	Slight	Slight	Slight	Moderate	Loblolly pine-------	95	Loblolly pine, slash pine, yellow-poplar, sweetgum, American sycamore.
						Slash pine----------	95	
						Yellow-poplar-------	105	
						Sweetgum------------	95	
						American sycamore---	105	
						Water Oak-----------	95	
ChB---------- Chrysler	1w	Slight	Moderate	Slight	Severe	Loblolly pine-------	96	Loblolly pine, slash pine, sweetgum, water oak, American sycamore, yellow-poplar.
						Shortleaf pine------	90	
						Slash pine----------	100	
						Sweetgum------------	90	
						Water oak-----------	100	
						Yellow-poplar-------	110	
						American sycamore---	110	
CnB---------- Congaree	1o	Slight	Slight	Slight	Moderate	Sweetgum------------	100	Loblolly pine, slash pine, yellow-poplar, American sycamore, sweetgum.
						Yellow-poplar-------	107	
						Loblolly pine-------	95	
						American sycamore---	110	
						Willow oak----------	95	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
EcA---------- Escambia	2w	Slight	Moderate	Slight	Slight	Loblolly pine-------	95	Loblolly pine, slash pine, sweetgum.
						Longleaf pine-------	85	
						Slash pine----------	95	
						Sweetgum------------	95	
EsC---------- Esto	3o	Slight	Slight	Slight	Moderate	Loblolly pine-------	82	Loblolly pine, longleaf pine.
						Longleaf pine-------	66	
						Slash pine----------	82	
GdA---------- Grady	4w	Slight	Severe	Severe	Severe	Baldcypress---------	68	American sycamore, water tupelo.
						Blackgum------------	65	
						Water oak-----------	65	
GrB, GrC---------- Greenville	3o	Slight	Slight	Slight	Moderate	Loblolly pine-------	85	Loblolly pine, longleaf pine, slash pine.
						Longleaf pine-------	70	
						Slash pine----------	85	
HaB, HaC---------- Halso	2c	Slight	Slight	Slight	Severe	Loblolly pine-------	86	Loblolly pine, slash pine, water oak, sweetgum.
						Slash pine----------	86	
						Shortleaf pine------	80	
						Water oak-----------	90	
						Sweetgum------------	90	
ImA:* Iuka----------	1w	Slight	Moderate	Moderate	Severe	Loblolly pine-------	100	Loblolly pine, eastern cottonwood, yellow-poplar.
						Sweetgum------------	100	
						Eastern cottonwood--	105	
						Water oak-----------	100	
Mantachie---------	1w	Slight	Severe	Severe	Severe	Green ash-----------	80	Green ash, eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
						Eastern cottonwood--	90	
						Loblolly pine-------	98	
						Sweetgum------------	95	
						Yellow-poplar-------	95	
IrB---------- Izagora	2w	Slight	Moderate	Slight	Severe	Loblolly pine-------	90	Loblolly pine, slash pine, sweetgum, yellow-poplar, water oak, American sycamore.
						Slash pine----------	90	
						Sweetgum------------	90	
						Yellow-poplar-------	100	
						Water oak-----------	90	
						American sycamore---	100	
LaA---------- Lenoir	2w	Slight	Severe	Moderate	Severe	Loblolly pine-------	90	Loblolly pine, slash pine, longleaf pine, sweetgum, American sycamore.
LcA, LcB---------- Lucedale	2o	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	Loblolly pine, slash pine, longleaf pine.
						Longleaf pine-------	75	
						Slash pine----------	90	
LnB, LnC---------- Lucy	3s	Slight	Moderate	Moderate	Moderate	Slash pine----------	84	Slash pine, longleaf pine, loblolly pine.
						Longleaf pine-------	70	
						Loblolly pine-------	80	
LtE:* Lucy----------	3s	Moderate	Moderate	Severe	Moderate	Longleaf pine-------	71	Longleaf pine, loblolly pine.
						Loblolly pine-------	84	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
Troup	3s	Moderate	Moderate	Severe	Moderate	Slash pine Longleaf pine	84 70	Slash pine, longleaf pine.
LvC Luverne	2c	Slight	Moderate	Slight	Moderate	Loblolly pine Slash pine Longleaf pine	88 85 70	Loblolly pine, slash pine, longleaf pine.
LvE Luverne	2c	Moderate	Moderate	Slight	Moderate	Loblolly pine Slash pine Longleaf pine	88 85 70	Loblolly pine, slash pine, longleaf pine.
MaA, MaB, MaC Malbis	2o	Slight	Slight	Slight	Moderate	Loblolly pine Slash pine Longleaf pine	90 90 80	Loblolly pine, slash pine.
PoA Poarch	2o	Slight	Slight	Slight	Moderate	Slash pine Loblolly pine Longleaf pine	94 94 70	Slash pine, loblolly pine, longleaf pine.
PrD Prim	3d	Slight	Severe	Moderate	Slight	Eastern redcedar	47	Eastern redcedar.
SfC, SfD Saffell	4f	Slight	Slight	Moderate	Slight	Loblolly pine Longleaf pine Southern red oak	67 --- ---	Loblolly pine.
SgF:* Saffell	4f	Moderate	Moderate	Moderate	Slight	Loblolly pine Longleaf pine Southern red oak	67 --- ---	Loblolly pine.
Lucy	3s	Moderate	Moderate	Severe	Moderate	Longleaf pine Loblolly pine	71 84	Longleaf pine, loblolly pine.
SmA Smithton	2w	Slight	Severe	Severe	Moderate	Loblolly pine Shortleaf pine Sweetgum Water oak Slash pine	90 80 90 90 90	Loblolly pine, sweetgum, slash pine.
StA Stough	2w	Slight	Moderate	Slight	Moderate	Loblolly pine Slash pine Sweetgum Water oak	90 86 85 80	Loblolly pine, slash pine, sweetgum, water oak.
UdC Udorthents	5s	Moderate	Slight	Moderate	Slight	Loblolly pine	50	Loblolly pine.
UnA Una	3w	Slight	Severe	Severe	Severe	Baldcypress Water tupelo Swamp tupelo	--- 70 ---	
UrA Urbo	1w	Slight	Severe	Severe	Moderate	Green ash Eastern cottonwood Cherrybark oak Sweetgum Water oak	93 108 99 98 100	Water oak, sweetgum.

* See description of the map unit for composition and behavior characteristsics of the map unit.

TABLE 8.--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]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ArF---- Arundel	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
AtA---- Atmore	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
BaB---- Bama	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
BaC---- Bama	Slight----	Slight----	Severe: slope.	Slight----	Slight.
BhC:* Bama----	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
Urban land.					
BeB---- Beatrice	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
BeC---- Beatrice	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Slight.
BnB---- Benndale	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
BrA---- Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
BsB---- Bigbee	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, flooding, too sandy.
CaA---- Cahaba	Severe: flooding.	Slight----	Moderate: flooding.	Slight----	Moderate: flooding.
ChB---- Chrysler	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, flooding.	Severe: erodes easily.	Moderate: wetness, flooding.
CnB---- Congaree	Severe: flooding.	Slight----	Moderate: flooding, slope.	Slight----	Moderate: flooding.
EcA---- Escambia	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
EsC---- Esto	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----	Slight.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GdA---------- Grady	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
GrB---------- Greenville	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
GrC---------- Greenville	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
HaB---------- Halso	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight----------	Slight.
HaC---------- Halso	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight----------	Slight.
ImA:* Iuka----------	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
Mantachie----------	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
IrB---------- Izagora	Severe: flooding.	Moderate: wetness.	Moderate: slope, wetness, flooding.	Slight----------	Moderate: flooding.
LaA---------- Lenoir	Severe: wetness, flooding.	Moderate: flooding, wetness, percs slowly.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
LcA---------- Lucedale	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
LcB---------- Lucedale	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
LnB---------- Lucy	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
LnC---------- Lucy	Slight----------	Slight----------	Severe: slope.	Slight----------	Moderate: droughty.
LtE:* Lucy----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Troup----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
LvC---------- Luverne	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight.
LvE---------- Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MaA---------- Malbis	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
MaB---------- Malbis	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
MaC---------- Malbis	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
PoA---------- Poarch	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
PrD---------- Prim	Severe: large stones, small stones.	Severe: large stones, small stones.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: small stones, large stones.
SfC, SfD---------- Saffell	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Severe: small stones.	Severe: small stones.
SgF:* Saffell----------	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
Lucy----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SmA---------- Smithton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
StA---------- Stough	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
UdC.* Udorthents					
UnA---------- Una	Severe: flooding, ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
UrA---------- Urbo	Severe: flooding, wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	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
ArF---- Arundel	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
AtA---- Atmore	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
BaB---- Bama	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BaC---- Bama	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BbC:* Bama----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
BeB---- Beatrice	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
BeC---- Beatrice	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BnB---- Benndale	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BrA---- Bibb	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
BsB---- Bigbee	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.
CaA---- Cahaba	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ChB---- Chrysler	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CnB---- Congaree	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
EcA---- Escambia	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
EsC---- Esto	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GdA---- Grady	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
GrB---- Greenville	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GrC---- Greenville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	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
HaB---------- Halso	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HaC---------- Halso	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ImA:*										
Iuka----------	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Mantachie----------	Poor	Fair	Fair	Good	---	Fair	Fair	Fair	Good	Fair.
IrB---------- Izagora	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LaA---------- Lenoir	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
LcA, LcB---------- Lucedale	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LnB, LnC---------- Lucy	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
LtE:*										
Lucy----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Troup----------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
LvC---------- Luverne	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LvE---------- Luverne	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MaA---------- Malbis	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MaB---------- Malbis	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MaC---------- Malbis	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PoA---------- Poarch	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
PrD---------- Prim	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
SfC, SfD---------- Saffell	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SgF:*										
Saffell----------	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Lucy----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	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
SmA---------- Smithton	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
StA---------- Stough	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
UdC.* Udorthents										
UnA---------- Una	Poor	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Very poor.	Good.
UrA---------- Urbo	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Fair	Fair.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--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]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ArF---------- Arundel	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
AtA---------- Atmore	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BaB---------- Bama	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
BaC---------- Bama	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
BbC:* Bama----------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
Urban land.						
BeB, BeC---------- Beatrice	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
BnB---------- Benndale	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
BrA---------- Bibb	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
BsB---------- Bigbee	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: droughty, flooding, too sandy.
CaA---------- Cahaba	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
ChB---------- Chrysler	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Moderate: wetness, flooding.
CnB---------- Congaree	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
EcA---------- Escambia	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
EsC---------- Esto	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
GdA--- Grady	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
GrB--- Greenville	Moderate: too clayey.	Slight---	Slight---	Slight---	Moderate: low strength.	Slight.
GrC--- Greenville	Moderate: too clayey.	Slight---	Slight---	Moderate: slope.	Moderate: low strength.	Slight.
HaB, HaC--- Halso	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
ImA:*						
Iuka---	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
Mantachie---	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
IrB--- Izagora	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
LaA--- Lenoir	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: low strength, wetness, flooding.	Severe: flooding.
LcA, LcB--- Lucedale	Slight---	Slight---	Slight---	Slight---	Slight---	Slight.
LnE--- Lucy	Moderate: cutbanks cave.	Slight---	Slight---	Slight---	Slight---	Moderate: droughty.
LnC--- Lucy	Moderate: cutbanks cave.	Slight---	Slight---	Moderate: slope.	Slight---	Moderate: droughty.
LtE:*						
Lucy---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Troup---	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
LvC--- Luverne	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
LvE--- Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
MaA, MaB--- Malbis	Moderate: wetness.	Slight---	Moderate: wetness.	Slight---	Moderate: low strength.	Slight.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MaC---------- Malbis	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Moderate: low strength.	Slight.
PoA---------- Poarch	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
PrD---------- Prim	Severe: depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: small stones, large stones.
SfC---------- Saffell	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: small stones.
SfD---------- Saffell	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones.
SgF:* Saffell----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Lucy----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SmA---------- Smithton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
StA---------- Stough	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
UdC.* Udorthents						
UnA---------- Una	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
UrA---------- Urbo	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding.	Severe: flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--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]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ArF---------- Arundel	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
AtA---------- Atmore	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
BaB---------- Bama	Slight----------	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
BaC---------- Bama	Slight----------	Severe: slope.	Slight----------	Slight----------	Good.
BbC:* Bama----------	Slight----------	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
Urban land.					
BeB---------- Beatrice	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
BeC---------- Beatrice	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
BnB---------- Benndale	Slight----------	Moderate: seepage, slope.	Severe: seepage.	Slight----------	Good.
BrA---------- Bibb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
BsB---------- Bigbee	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
CaA---------- Cahaba	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding.	Fair: thin layer.
ChB---------- Chrysler	Severe: flooding, wetness, percs slowly.	Moderate: slope.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CnB---------- Congaree	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
EcA---------- Escambia	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Fair: wetness.
EsC---------- Esto	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, hard to pack.
GdA---------- Grady	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: ponding.
GrB, GrC---------- Greenville	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
HaB---------- Halso	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
HaC---------- Halso	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
ImA:*					
Iuka----------	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Mantachie----------	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
IrB---------- Izagora	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Fair: too clayey, wetness, thin layer.
LaA---------- Lenoir	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
LcA---------- Lucedale	Slight----------	Moderate: seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
LcB---------- Lucedale	Slight----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
LnB, LnC---------- Lucy	Slight----------	Severe: seepage.	Slight----------	Severe: seepage.	Good.
LtE:*					
Lucy----------	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LtE:* Troup	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: seepage, slope.
LvC Luverne	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
LvE Luverne	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
MaA Malbis	Severe: wetness, percs slowly.	Slight	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
MaB, MaC Malbis	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
PoA Poarch	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Moderate: wetness.	Fair: wetness.
PrD Prim	Severe: depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock.	Poor: area reclaim, large stones.
SfC Saffell	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Poor: small stones.
SfD Saffell	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Poor: small stones.
SgF:* Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
Lucy	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.
SmA Smithton	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
StA Stough	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
UdC.* Udorthents					

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
UnA---------- Una	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
UrA---------- Urbo	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--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]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
ArF---- Arundel	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
AtA---- Atmore	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BaB, BaC---- Bama	Good----	Improbable: excess fines.	Improbable: excess fines.	Good.
BbC:* Bama----	Good----	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
BeB, BeC---- Beatrice	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
BnB---- Benndale	Good----	Improbable: excess fines.	Improbable: excess fines.	Good.
BrA---- Bibb	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BsB---- Bigbee	Good----	Probable----	Improbable: too sandy.	Poor: too sandy.
CaA---- Cahaba	Good----	Probable----	Improbable: excess fines.	Fair: small stones.
ChB---- Chrysler	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CnB---- Congaree	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
EcA---- Escambia	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
EsC---- Esto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
GdA---- Grady	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
GrB, GrC---- Greenville	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
HaB, HaC---------- Halso	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
ImA:*				
Iuka----------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Mantachie----------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
IrB---------- Izagora	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
LaA---------- Lenoir	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
LcA, LcB---------- Lucedale	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
LnB, LnC---------- Lucy	Good----------	Improbable: excess fines, thin layer.	Improbable: excess fines.	Fair: too sandy.
LtE:*				
Lucy----------	Fair: slope.	Improbable: excess fines, thin layer.	Improbable: excess fines.	Poor: slope.
Troup----------	Fair: slope.	Probable----------	Improbable: too sandy.	Poor: slope.
LvC---------- Luverne	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
LvE---------- Luverne	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
MaA, MaB, MaC--------- Malbis	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
PoA---------- Poarch	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
PrD---------- Prim	Poor: area reclaim, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, large stones.
SfC, SfD---------- Saffell	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SgF:*				
Saffell----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
SgF:* Lucy	Poor: slope.	Improbable: excess fines, thin layer.	Improbable: excess fines.	Poor: slope.
SmA Smithton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
StA Stough	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
UdC.* Udorthents				
UnA Una	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
UrA Urbo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--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]

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
ArF---------- Arundel	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
AtA---------- Atmore	Moderate: seepage.	Severe: piping, wetness.	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
BaB, BaC---------- Bama	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
BbC:* Bama----------	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
Urban land.						
BeB, BeC---------- Beatrice	Moderate: slope.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
BnB---------- Benndale	Moderate: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
BrA---------- Bibb	Moderate: seepage.	Severe: piping, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
BsB---------- Bigbee	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
CaA---------- Cahaba	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable------	Favorable------	Favorable.
ChB---------- Chrysler	Slight---------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
CnB---------- Congaree	Moderate: seepage.	Severe: piping.	Flooding-------	Wetness--------	Erodes easily, wetness.	Erodes easily.
EcA---------- Escambia	Moderate: seepage.	Severe: wetness.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Percs slowly.
EsC---------- Esto	Moderate: slope.	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
GdA---------- Grady	Slight---------	Severe: ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
GrB, GrC---------- Greenville	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
HaB, HaC---------- Halso	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
ImA:* Iuka----------	Moderate: seepage.	Severe: piping, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
Mantachie--------	Moderate: seepage.	Severe: piping, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
IrB---------- Izagora	Moderate: seepage.	Moderate: piping, wetness.	Flooding-------	Wetness, percs slowly, flooding.	Wetness--------	Favorable.
LaA---------- Lenoir	Slight---------	Severe: wetness.	Wetness, percs slowly, erodes easily.	Percs slowly, erodes easily, flooding.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
LcA---------- Lucedale	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Favorable------	Favorable.
LcB---------- Lucedale	Moderate: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
LnB, LnC---------- Lucy	Severe: seepage.	Moderate: piping.	Deep to water	Droughty, fast intake, slope.	Too sandy------	Droughty.
LtE:* Lucy----------	Severe: seepage.	Moderate: piping.	Deep to water	Droughty, fast intake, slope.	Too sandy, slope.	Slope, droughty.
Troup----------	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
LvC---------- Luverne	Moderate: slope.	Severe: piping, hard to pack.	Deep to water	Slope----------	Favorable------	Favorable.
LvE---------- Luverne	Severe: slope.	Severe: piping, hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
MaA---------- Malbis	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Favorable------	Favorable.
MaB, MaC---------- Malbis	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
PoA---------- Poarch	Moderate: seepage.	Severe: piping.	Favorable------	Wetness--------	Wetness--------	Favorable.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
PrD---------- Prim	Severe: depth to rock, slope.	Severe: thin layer, large stones.	Deep to water	Large stones, depth to rock.	Slope, large stones, slope.	Large stones, slope.
SfC---------- Saffell	Moderate: seepage, slope.	Moderate: thin layer.	Deep to water	Droughty, slope.	Favorable------	Droughty.
SfD---------- Saffell	Severe: slope.	Moderate: thin layer.	Deep to water	Droughty, slope.	Slope----------	Slope, droughty.
SgF:* Saffell----------	Severe: slope.	Moderate: thin layer.	Deep to water	Droughty, slope.	Slope----------	Slope, droughty.
Lucy----------	Severe: seepage, slope.	Moderate: piping.	Deep to water	Droughty, fast intake, slope.	Too sandy, slope.	Slope, droughty.
SmA---------- Smithton	Slight---------	Severe: piping, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
StA---------- Stough	Slight---------	Moderate: piping, wetness.	Favorable------	Wetness, droughty.	Erodes easily, wetness.	Wetness, erodes easily, droughty.
UdC.* Udorthents						
UnA---------- Una	Slight---------	Severe: ponding.	Ponding, percs slowly, flooding.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
UrA---------- Urbo	Slight---------	Severe: wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils may have Unified classifications and USDA textures in addition to those shown. In general, the dominant classifications and textures are shown]

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
ArF---------- Arundel	0-5	Loam----------	ML, CL, CL-ML	A-4	0-6	85-100	77-98	75-98	60-90	<30	NP-10
	5-22	Silty clay loam, silty clay, clay.	CL, CH	A-7	0-15	85-98	80-95	80-95	65-90	44-65	22-40
	22-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
AtA---------- Atmore	0-6	Silt loam--------	ML	A-4	0	90-100	90-100	85-100	60-90	<32	NP-7
	6-50	Loam, silt loam	ML, CL-ML	A-4	0	80-100	80-100	80-96	55-80	<25	NP-7
	50-68	Silt loam, clay loam, silty clay loam.	ML, CL, SM, SC	A-4, A-6	0	78-100	75-100	70-96	40-70	20-40	2-18
BaB, BaC--------- Bama	0-13	Sandy loam-------	SM, SC, SM-SC, CL-ML	A-4	0	95-100	85-100	70-95	40-70	<30	NP-10
	13-40	Loam, sandy clay loam.	SM, SC, SM-SC, CL-ML	A-4, A-6	0	90-100	85-100	80-95	36-70	16-35	2-15
	40-65	Loam, sandy clay loam, clay loam.	SC, CL	A-4, A-6	0	85-100	80-100	80-95	40-70	20-40	8-18
BtC:*											
Bama----------	0-13	Sandy loam-------	SM, SC, SM-SC, CL-ML	A-4	0	95-100	85-100	70-95	40-70	<30	NP-10
	13-40	Loam, sandy clay loam.	SM, SC, SM-SC, CL-ML	A-4, A-6	0	90-100	85-100	80-95	36-70	16-35	2-15
	40-65	Loam, sandy clay loam, clay loam.	SC, CL	A-4, A-6	0	85-100	80-100	80-95	40-70	20-40	8-18
Urban land.											
BeB, BeC--------- Beatrice	0-3	Silt loam--------	CL-ML, CL	A-4, A-6	0	95-100	94-100	80-100	60-85	20-35	5-15
	3-50	Clay----------	MH	A-7	0	95-100	95-100	95-100	95-100	60-82	24-42
	50-72	Stratified clay to sandy clay loam.	---	---	---	---	---	---	---	---	---
BnB---------- Benndale	0-10	Sandy loam-------	ML, SM, CL-ML, SM-SC	A-4, A-2-4	0	100	100	60-96	30-55	<25	NP-7
	10-57	Loam, sandy loam, fine sandy loam.	ML, SM, CL-ML, SM-SC	A-4	0	100	100	70-95	40-75	18-22	3-7
	57-64	Loam, sandy loam, sandy clay loam.	ML, SM, CL-ML, SM-SC	A-4, A-6	0	100	100	70-98	40-75	18-38	3-15
BrA---------- Bibb	0-8	Loam----------	ML, CL-ML	A-4	0-5	95-100	90-100	80-90	50-80	<25	NP-7
	8-60	Sandy loam, loam, silt loam.	SM, SM-SC, ML, CL-ML	A-2, A-4	0-10	60-100	50-100	40-100	30-90	<30	NP-7

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BsB---------- Bigbee	0-13	Sand----------	SM, SP-SM	A-2-4, A-3	0	100	95-100	50-75	5-20	---	NP
	13-80	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	85-100	85-100	50-75	5-20	---	NP
CaA---------- Cahaba	0-9	Sandy loam-------	SM	A-4, A-2-4	0	95-100	95-100	65-90	30-45	---	NP
	9-50	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6	0	90-100	80-100	75-90	40-75	22-35	8-15
	50-65	Sand, loamy sand, sandy loam.	SM, SP-SM	A-2-4	0	95-100	90-100	60-85	10-35	---	NP
ChB---------- Chrysler	0-7	Silt loam--------	CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	69-90	20-35	5-20
	7-72	Silty clay loam, silty clay, clay.	CL, ML, CH, MH	A-7	0	95-100	95-100	90-100	85-100	45-70	15-35
	72-96	Variable---------	---	---	---	---	---	---	---	---	---
CnB---------- Congaree	0-6	Loam----------	CL-ML, ML, CL	A-4	0	95-100	95-100	70-100	51-90	20-35	3-10
	6-34	Silty clay loam, fine sandy loam, loam.	SC, ML, CL, SM	A-4, A-6, A-7	0	95-100	95-100	70-100	40-90	25-50	3-22
	34-60	Variable---------	---	---	---	---	---	---	---	---	---
EcA---------- Escambia	0-9	Very fine sandy loam.	SM, SM-SC, ML, CL-ML	A-4	0	95-100	95-100	70-90	40-65	<25	NP-7
	9-43	Fine sandy loam, loam, silt loam.	SC, SM-SC, CL, CL-ML	A-4, A-6	0	95-100	95-100	70-95	40-75	20-30	4-15
	43-61	Fine sandy loam, loam, silt loam.	SC, CL, SM-SC	A-4, A-6	0	87-95	87-95	60-95	35-80	20-35	4-20
EsC---------- Esto	0-4	Sandy loam-------	SM, SM-SC, ML, CL-ML	A-4, A-2	0	95-100	85-100	70-96	25-55	<25	NP-6
	4-10	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	0	95-100	85-100	85-100	45-90	35-50	12-25
	10-61	Clay loam, clay, sandy clay.	CL, CH	A-7	0	95-100	85-100	85-100	51-98	40-80	18-52
GdA---------- Grady	0-6	Loam----------	ML, CL-ML, CL	A-4, A-6	0	100	99-100	85-100	50-75	<30	NP-15
	6-13	Clay loam, sandy clay loam, loam.	CL	A-6	0	100	100	90-100	51-80	25-40	11-20
	13-65	Clay, sandy clay	CL, ML, CH	A-6, A-7	0	100	100	90-100	55-90	30-51	12-25
GrB, GrC--------- Greenville	0-6	Sandy loam-------	SM, SC, SM-SC, CL-ML	A-2, A-4	0	95-100	90-100	65-85	30-55	<25	NP-10
	6-72	Clay loam, sandy clay, clay.	CL, SC, ML	A-6, A-7, A-4	0	98-100	95-100	80-95	40-80	28-50	7-25

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HaB, HaC----------	0-5	Sandy loam-------	SM, ML	A-4	0	95-100	95-100	70-100	40-70	<20	NP
Halso	5-31	Clay, silty clay	ML, MH	A-7	0	95-100	95-100	90-100	80-98	45-70	15-35
	31-47	Very channery clay loam, channery sandy clay loam, very channery clay.	GC, CL, CL-ML, GM-GC	A-2, A-4, A-6	0-10	40-65	30-60	28-58	26-56	21-40	4-16
	47-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
ImA:*											
Iuka----------	0-5	Loamy sand-------	SM	A-2	0	100	95-100	50-75	10-30	---	NP
	5-30	Fine sandy loam, loam, sandy loam.	SM, SM-SC, ML, CL-ML	A-4	0	95-100	85-100	65-100	36-75	<30	NP-7
	30-66	Sandy loam, fine sandy loam, loam.	SM, ML	A-2, A-4	0	95-100	90-100	70-100	25-60	<30	NP-7
Mantachie-------	0-3	Loam-------------	CL-ML, SM-SC, SM, ML	A-4	0-5	95-100	90-100	60-85	40-60	<20	NP-5
	3-66	Loam, clay loam, sandy clay loam.	CL, SC, SM-SC, CL-ML	A-4, A-6	0-5	95-100	90-100	80-95	45-80	20-40	5-15
IrB---------------	0-12	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	95-100	95-100	70-95	40-65	<25	NP-5
Izagora	12-35	Loam, clay loam, silty clay loam.	CL	A-4, A-6, A-7	0	95-100	95-100	85-100	60-95	25-45	8-25
	35-63	Clay loam, clay	CL, CH	A-6, A-7	0	95-100	95-100	90-100	70-95	35-60	20-40
LaA---------------	0-4	Loam-------------	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	20-35	4-10
Lenoir	4-66	Clay, silty clay, clay loam.	CL, CH	A-6, A-7	0	100	100	85-95	55-95	30-55	11-35
LcA---------------	0-8	Loam-------------	SM, ML	A-2, A-4	0	100	95-100	80-95	25-65	<30	NP-3
Lucedale	8-68	Sandy clay loam, clay loam, loam.	CL-ML, SC, CL, SM-SC	A-4, A-6, A-2	0	95-100	95-100	80-100	30-75	25-40	4-15
LcB---------------	0-8	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	80-95	25-65	<30	NP-3
Lucedale	8-68	Sandy clay loam, clay loam, loam.	CL-ML, SC, CL, SM-SC	A-4, A-6, A-2	0	95-100	95-100	80-100	30-75	25-40	4-15
LnB, LnC----------	0-25	Loamy sand-------	SM, SP-SM	A-2	0	98-100	95-100	50-87	10-30	---	NP
Lucy	25-34	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	<30	NP-15
	34-66	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, SM	A-2, A-6, A-4	0	100	95-100	60-95	20-50	20-40	3-20
LtE:*											
Lucy----------	0-25	Loamy sand-------	SM, SP-SM	A-2	0	98-100	95-100	50-87	10-30	---	NP
	25-34	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	<30	NP-15
	34-66	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, SM	A-2, A-6, A-4	0	100	95-100	60-95	20-50	20-40	3-20

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LtE:*											
Troup----------	0-54	Loamy sand-------	SM, SP-SM	A-2, A-4	0	95-100	90-100	50-90	10-40	---	NP
	54-72	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2, A-6	0	95-100	90-100	60-90	24-55	19-40	4-20
LvC, LvE---------	0-4	Sandy loam-------	ML, SM	A-4, A-2	0-5	87-100	84-100	80-100	30-60	<20	NP
Luverne	4-26	Clay loam, sandy clay, clay.	ML, MH	A-5, A-7, A-4	0-5	95-100	90-100	85-100	50-95	38-70	8-30
	26-50	Clay loam, sandy clay loam.	ML, MH, SM	A-4, A-5, A-7	0-5	95-100	85-100	85-100	36-76	32-56	2-14
	50-72	Stratified loamy sand to sandy clay loam.	SM, ML	A-4, A-6, A-2, A-7	0-5	90-100	85-100	70-100	25-65	28-49	3-16
MaA, MaB, MaC----	0-9	Loam------------	SM, ML	A-4	0	100	97-100	91-97	40-62	<30	NP-5
Malbis	9-33	Loam, sandy clay loam, clay loam.	CL-ML, CL	A-4, A-6	0	99-100	95-100	89-100	55-70	21-35	5-11
	33-43	Sandy clay loam, clay loam.	ML, CL	A-4, A-5, A-6, A-7	0	98-100	96-100	90-100	56-80	29-49	4-15
	43-72	Sandy clay loam, clay loam.	ML, CL	A-4, A-5, A-6, A-7	0	98-100	96-100	90-100	56-80	30-49	4-15
PoA----------	0-4	Very fine sandy loam.	ML, CL-ML	A-4	0	95-100	95-100	80-95	51-75	<25	NP-5
Poarch	4-34	Loam, fine sandy loam, silt loam.	ML, CL-ML, CL	A-4	0	95-100	95-100	85-95	51-75	20-30	NP-10
	34-72	Loam, fine sandy loam, silt loam.	ML, CL, CL-ML	A-4	0	85-100	85-100	85-95	51-75	20-30	2-10
PrD----------	0-9	Very cobbly loam	CL, GC, SC	A-4, A-6, A-7	30-63	70-90	45-75	40-75	40-70	30-44	8-20
Prim	9-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
SfC, SfD---------	0-10	Very gravelly sandy loam.	GM	A-1, A-2	0-15	40-60	30-50	25-50	15-30	<20	NP-3
Saffell	10-14	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	14-35	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
	35-60	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
SgF:*											
Saffell	0-10	Very gravelly sandy loam.	GM	A-1, A-2	0-15	40-60	30-50	25-50	15-30	<20	NP-3
	10-14	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	14-35	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
	35-60	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
Lucy	0-25	Loamy sand	SM, SP-SM	A-2	0	98-100	95-100	50-87	10-30	---	NP
	25-34	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	<30	NP-15
	34-60	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, SM	A-2, A-6, A-4	0	100	95-100	60-95	20-50	20-40	3-20
SmA	0-5	Sandy loam	ML, SM	A-2, A-4	0	95-100	95-100	60-95	30-65	---	NP
Smithton	5-42	Fine sandy loam, loam.	ML, CL-ML	A-4	0	95-100	95-100	85-95	55-80	16-25	2-7
	42-72	Fine sandy loam, loam, silt loam.	CL-ML, CL	A-4, A-6	0	95-100	95-100	90-100	60-90	20-30	5-15
StA	0-25	Sandy loam	SM-SC, SM, ML, CL-ML	A-4	0	100	100	65-85	35-65	<25	NP-7
Stough	25-32	Loam, fine sandy loam.	ML, CL, CL-ML	A-4	0	100	100	75-95	50-75	<25	NP-8
	32-67	Sandy loam, sandy clay loam, loam.	SC, CL	A-4, A-6	0	100	100	65-90	40-65	25-40	8-15
UdC.*											
Udorthents											
UnA	0-2	Silty clay loam	CH, CL	A-7	0	100	94-100	90-100	75-95	41-65	20-40
Una	2-72	Clay, silty clay loam, silty clay.	CH, CL	A-7	0	100	94-100	90-100	75-95	41-65	20-40
UrA	0-6	Silty clay loam	CL	A-6	0	100	100	95-100	95-100	30-40	15-25
Urbo	6-66	Silty clay, clay loam, silty clay loam.	CL, CH	A-7	0	100	100	95-100	80-98	44-62	20-36

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--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]

Map symbol and soil name	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
ArF	0-5	15-25	1.40-1.50	0.6-2.0	0.14-0.17	3.6-5.5	Low	0.37	3	.5-1
Arundel	5-22	35-78	1.55-1.65	<0.06	0.12-0.18	3.6-4.4	High	0.32		
	22-60	---	---	---	---	---	---	---		
AtA	0-6	2-12	1.35-1.60	0.6-2.0	0.16-0.24	3.6-5.5	Low	0.37	3	.5-3
Atmore	6-50	6-18	1.35-1.60	0.6-2.0	0.16-0.24	3.6-5.5	Low	0.37		
	50-68	15-40	1.45-1.65	0.2-0.6	0.18-0.22	3.6-5.5	Low	0.32		
BaB, BaC	0-13	7-22	1.30-1.60	0.6-6.0	0.08-0.15	4.5-6.0	Low	0.24	5	1-2
Bama	13-40	18-32	1.40-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.32		
	40-60	20-35	1.40-1.60	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.32		
BbC:*										
Bama	0-13	7-22	1.30-1.60	0.6-6.0	0.08-0.15	4.5-6.0	Low	0.24	5	.5-1
	13-40	18-32	1.40-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.32		
	40-60	20-35	1.40-1.60	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.32		
Urban land.										
BeB, BeC	0-3	10-25	1.20-1.50	0.6-2.0	0.15-0.24	3.6-6.0	Low	0.37	4	.5-1
Beatrice	3-50	60-80	1.05-1.40	<0.06	0.12-0.18	3.6-5.0	High	0.32		
	50-72	---	---	---	---	---	---	---		
BnB	0-10	6-14	1.45-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.20	5	1-2
Benndale	10-57	10-18	1.55-1.65	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.28		
	57-64	14-28	1.55-1.65	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.32		
	68-73	6-20	1.55-1.65	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.28		
BrA	0-8	2-18	1.20-1.55	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.28	5	1-2
Bibb	8-40	2-18	1.30-1.60	0.6-2.0	0.12-0.20	4.5-5.5	Low	0.37		
BsB	0-13	1-10	1.40-1.50	6.0-20	0.05-0.10	4.5-6.0	Low	0.10	5	.5-1
Bigbee	13-80	1-10	1.40-1.50	6.0-20	0.05-0.08	4.5-6.0	Low	0.17		
CaA	0-9	7-17	1.35-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low	0.24	5	1-2
Cahaba	9-50	18-35	1.35-1.60	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.28		
	50-65	4-20	1.40-1.70	2.0-20	0.05-0.10	4.5-6.0	Low	0.24		
ChB	0-7	10-20	1.35-1.55	0.6-2.0	0.14-0.20	4.5-5.5	Low	0.37	5	1-2
Chrysler	7-72	35-60	1.20-1.50	0.06-0.2	0.14-0.18	4.5-5.5	Moderate	0.32		
	72-96	10-40	1.35-1.65	0.2-0.6	0.14-0.18	4.5-5.5	Low	0.32		
CnB	0-6	10-25	1.20-1.40	0.6-2.0	0.12-0.20	4.5-7.3	Low	0.37	5	2-4
Congaree	6-34	18-35	1.20-1.50	0.6-2.0	0.12-0.20	4.5-7.3	Low	0.37		
	34-60	---	---	---	---	---	---	---		
EcA	0-9	5-14	1.35-1.55	2.0-6.0	0.11-0.15	5.1-5.5	Low	0.24	4	1-2
Escambia	9-43	8-18	1.35-1.55	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.24		
	43-61	8-10	1.45-1.65	0.06-0.6	0.10-0.18	4.5-5.5	Low	0.28		
EsC	0-4	8-20	1.45-1.65	2.0-6.0	0.11-0.15	4.5-5.5	Low	0.28	3	<1
Esto	4-10	26-45	1.55-1.65	0.6-2.0	0.12-0.17	4.5-5.5	Moderate	0.32		
	10-61	35-60	1.50-1.65	0.06-0.2	0.12-0.18	4.5-5.5	Moderate	0.32		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	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
GdA----------	0-6	20-30	1.20-1.45	0.6-2.0	0.10-0.18	3.6-5.5	Low----------	0.24	5	1-2
Grady	6-13	20-35	1.40-1.55	0.2-0.6	0.10-0.15	3.6-5.5	Low----------	0.10		
	13-65	45-65	1.50-1.60	0.06-0.2	0.12-0.16	3.6-5.5	Moderate-----	0.10		
GrB, GrC---------	0-6	5-20	1.30-1.65	0.6-6.0	0.07-0.14	4.5-6.0	Low----------	0.24	5	.5-1
Greenville	6-72	35-55	1.35-1.55	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.17		
HaB, HaC---------	0-5	7-20	1.30-1.60	0.6-2.0	0.11-0.15	3.6-5.5	Low----------	0.28	3	.5-2
Halso	5-31	45-70	1.10-1.40	<0.06	0.12-0.18	3.6-5.5	High---------	0.32		
	31-47	25-50	1.30-1.65	<0.06	0.04-0.08	3.6-5.5	Moderate-----	0.24		
	47-60	---	---	---	---	---	----------	----		
ImA:*										
Iuka----------	0-5	2-10	1.20-1.40	6.0-20	0.06-0.10	5.1-6.0	Low----------	0.17	5	.5-1
	5-30	8-18	1.20-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.28		
	30-66	5-15	1.20-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.20		
Mantachie-------	0-3	8-20	1.50-1.60	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.28	5	1-2
	3-66	18-34	1.50-1.60	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.28		
IrB----------	0-12	8-20	1.40-1.65	2.0-6.0	0.11-0.20	3.6-6.0	Low----------	0.28	4	.5-1
Izagora	12-35	18-30	1.40-1.60	0.6-2.0	0.12-0.20	3.6-5.5	Low----------	0.32		
	35-63	35-55	1.30-1.60	0.06-0.2	0.16-0.20	3.6-5.5	Moderate-----	0.32		
LaA----------	0-4	6-20	1.30-1.50	0.6-2.0	0.14-0.18	3.6-5.5	Low----------	0.37	5	2-3
Lenoir	4-66	35-60	1.20-1.35	0.06-0.2	0.13-0.15	3.6-5.5	Moderate-----	0.32		
LcA, LcB---------	0-8	1-10	1.40-1.55	0.6-2.0	0.15-0.20	5.1-6.5	Low----------	0.24	5	1-2
Lucedale	8-68	20-30	1.55-1.70	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.24		
LnB, LnC---------	0-25	1-12	1.30-1.70	6.0-20	0.06-0.10	5.1-6.0	Low----------	0.15	5	.5-1
Lucy	25-34	10-30	1.40-1.60	2.0-6.0	0.10-0.12	4.5-5.5	Low----------	0.24		
	34-66	15-35	1.40-1.60	0.6-2.0	0.12-0.14	4.5-5.5	Low----------	0.28		
LtE:*										
Lucy----------	0-25	1-12	1.30-1.70	6.0-20	0.06-0.10	5.1-5.5	Low----------	0.15	5	.5-1
	25-34	10-30	1.40-1.60	2.0-6.0	0.10-0.12	4.5-5.5	Low----------	0.24		
	34-66	15-35	1.40-1.60	0.6-2.0	0.12-0.14	4.5-5.5	Low----------	0.28		
Troup----------	0-54	2-12	1.30-1.70	6.0-20	0.08-0.12	4.5-5.5	Very low-----	0.17	5	<1
	54-72	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.20		
LvC, LvE---------	0-4	7-20	1.35-1.65	2.0-6.0	0.11-0.15	4.5-5.5	Low----------	0.24	3	.5-1
Luverne	4-26	35-50	1.25-1.55	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	26-50	20-40	1.35-1.65	0.2-0.6	0.12-0.18	3.6-5.5	Low----------	0.28		
	50-72	10-35	1.35-1.65	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.28		
MaA, MaB, MaC----	0-9	10-25	1.30-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.24	5	.5-1
Malbis	9-33	18-33	1.30-1.70	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.28		
	33-43	20-35	1.40-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.28		
	43-72	20-35	1.45-1.70	0.2-0.6	0.06-0.12	4.5-5.5	Low----------	0.28		
PoA----------	0-4	7-15	1.35-1.55	2.0-6.0	0.10-0.15	4.5-5.5	Low----------	0.24	5	.5-1
Poarch	4-34	8-18	1.35-1.55	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.24		
	34-72	10-25	1.45-1.65	0.2-0.6	0.10-0.20	4.5-5.5	Low----------	0.24		
PrD----------	0-9	25-35	1.40-1.50	0.2-0.6	0.10-0.15	7.4-8.4	Moderate-----	0.24	1	2-5
Prim	9-60	---	---	---	---	---	----------	----		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	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
SfC, SfD---------	0-10	5-15	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.15	4	<2
Saffell	10-14	10-35	1.25-1.60	0.6-2.0	0.06-0.10	4.5-5.5	Low----------	0.28		
	14-35	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
	35-60	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.17		
SgF:*										
Saffell---------	0-10	5-15	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.15	4	<2
	10-14	10-35	1.25-1.60	0.6-2.0	0.06-0.10	4.5-5.5	Low----------	0.28		
	14-35	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
	35-60	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.17		
Lucy------------	0-25	1-12	1.30-1.70	6.0-20	0.06-0.10	5.1-6.0	Low----------	0.15	5	.5-1
	25-34	10-30	1.40-1.60	2.0-6.0	0.10-0.12	4.5-5.5	Low----------	0.24		
	34-60	15-35	1.40-1.60	0.6-2.0	0.12-0.14	4.5-5.5	Low----------	0.28		
SmA--------------	0-5	5-18	1.30-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.32	5	1-2
Smithton	5-42	12-18	1.30-1.50	0.2-0.6	0.11-0.20	4.5-5.5	Low----------	0.32		
	42-72	15-25	1.25-1.45	0.2-0.6	0.11-0.24	4.5-5.5	Low----------	0.37		
StA--------------	0-25	5-15	1.40-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.37	3	1-2
Stough	25-32	8-18	1.45-1.60	0.2-0.6	0.07-0.11	4.5-5.5	Low----------	0.37		
	32-67	5-27	1.55-1.65	0.2-0.6	0.07-0.11	4.5-5.5	Low----------	0.37		
UdC.*										
Udorthents										
UnA--------------	0-2	28-45	1.40-1.60	<0.06	0.15-0.20	4.5-5.5	High---------	0.32	5	1-2
Una	2-72	35-55	1.40-1.60	<0.06	0.15-0.20	4.5-5.5	High---------	0.28		
UrA--------------	0-6	12-35	1.40-1.50	0.06-0.2	0.19-0.21	4.5-5.5	Low----------	0.49	5	1-2
Urbo	6-66	35-55	1.45-1.55	<0.06	0.18-0.20	4.5-5.5	Moderate-----	0.28		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
ArF---------- Arundel	C	None--------	---	---	>6.0	---	---	20-40	Soft	High-----	High.
AtA---------- Atmore	B/D	None--------	---	---	0-1.0	Perched	Oct-Mar	>60	---	High-----	High.
BaB, BaC---------- Bama	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
BbC:* Bama----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Urban land.											
BeB, BeC---------- Beatrice	D	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
BnB---------- Benndale	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
BrA---------- Bibb	C	Frequent----	Brief-----	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60	---	High-----	Moderate.
BsB---------- Bigbee	A	Occasional	Brief-----	Jan-Mar	3.5-6.0	Apparent	Jan-Mar	>60	---	Low------	Moderate.
CaA---------- Cahaba	B	Occasional	Very brief	Nov-Feb	>6.0	---	---	>60	---	Moderate	Moderate.
ChB---------- Chrysler	C	Occasional	Brief-----	Dec-Apr	1.5-3.0	Apparent	Jan-Mar	>60	---	High-----	High.
CnB---------- Congaree	B	Occasional	Brief-----	Nov-Apr	2.5-4.0	Apparent	Nov-Apr	>60	---	Moderate	Moderate.
EcA---------- Escambia	C	None--------	---	---	1.5-2.5	Apparent	Dec-Mar	>60	---	Moderate	High.
EsC---------- Esto	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
GdA**---------- Grady	D	None--------	---	---	+2-1.0	Apparent	Dec-Jun	>60	---	High-----	High.
GrB, GrC---------- Greenville	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High.
HaB, HaC---------- Halso	D	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
ImA:* Iuka----------	C	Frequent----	Very brief to brief.	Jan-Apr	1.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	High.
Mantachie--------	C	Frequent----	Brief-----	Jan-Apr	1.0-1.5	Apparent	Dec-Apr	>60	---	High-----	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
IrB---------- Izagora	C	Occasional	Brief-----	Dec-Mar	2.0-3.0	Apparent	Dec-Mar	>60	---	Moderate	High.
LaA---------- Lenoir	D	Frequent----	Brief to long.	Dec-Jun	1.0-2.5	Apparent	Dec-May	>60	---	High-----	High.
LcA, LcB---------- Lucedale	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
LnB, LnC---------- Lucy	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
LtE:*											
Lucy----------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
Troup----------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
LvC, LvE---------- Luverne	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
MaA, MaB, MaC----- Malbis	B	None--------	---	---	2.5-4.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
PoA---------- Poarch	B	None--------	---	---	2.5-5.0	Apparent	Dec-Mar	>60	---	Low------	High.
PrD---------- Prim	D	None--------	---	---	>6.0	---	---	4-20	Soft	Moderate	Low.
SfC, SfD---------- Saffell	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
SgF:*											
Saffell----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Lucy----------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
SmA---------- Smithton	D	Occasional	Brief to long.	Dec-May	0-1.0	Perched	Dec-May	>60	---	High-----	High.
StA---------- Stough	C	None--------	---	---	1.0-1.5	Perched	Jan-Apr	>60	---	Moderate	High.
UdC.* Udorthents											
UnA**---------- Una	D	Frequent----	Very long	Jan-Dec	+2-0.5	Apparent	Jan-Dec	>60	---	High-----	High.
UrA---------- Urbo	D	Frequent----	Brief to long.	Jan-Mar	1.0-2.0	Apparent	Jan-Mar	>60	---	High-----	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

** In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water rises above the surface of the soil. The first number indicates how high the water rises above the surface. The second number indicates the depth below the surface.

TABLE 17.--PHYSICAL ANALYSIS OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2.0 mm)		
			Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (0.002 mm)
Arundel 1/					
(S78AL-099-1)	0- 5	A	36.1	47.6	16.3
	5-18	Bt1	34.5	25.1	40.4
	18-22	Bt2	26.5	37.5	36.0
Beatrice 1/					
(S79AL-099-13)	0- 3	Ap	27.6	52.5	19.9
	3-16	Bt1	2.2	27.4	70.4
	16-24	Bt2	2.5	30.7	66.8
	24-41	Bt3	3.8	33.7	62.5
	41-50	BC	3.7	36.1	60.2
	50-72	C	2.3	29.7	68.0
Chrysler 1/					
(S79AL-099-18)	0- 7	Ap	33.6	53.9	12.5
	7-14	Bt1	17.7	40.4	41.9
	14-27	Bt2	12.8	36.2	51.0
	27-72	Bt3	7.7	32.5	59.8
Chrysler 2/					
(S79AL-099-22)	6-18	Bt1	17.4	42.7	39.9
	29-96	Bt2	15.3	35.5	49.2
Escambia 1/					
(S79AL-099-22)	0- 9	Ap	61.0	34.4	4.6
	9-18	Bt1	54.9	39.0	6.1
	18-28	Bt2	49.8	41.4	8.8
	28-43	Btv1	43.2	40.0	16.8
	43-61	Btv2	33.1	35.3	31.6
Esto 1/					
(S79AL-099-15)	0- 4	A	73.4	20.9	5.7
	4-10	Bt1	35.5	25.8	38.7
	10-19	Bt2	25.4	23.2	51.4
	19-50	Bt3	21.3	28.7	50.0
	50-61	Bt4	28.9	25.3	45.8
	61-78	C	66.0	6.2	27.8
Greenville 3/					
(S77AL-099-3)	0- 3	A	51.6	33.7	14.7
	3- 6	A/B	49.2	29.6	21.2
	6-10	Bt1	42.1	26.3	31.6
	10-18	Bt2	34.6	20.2	45.2
	18-75	Bt3	42.2	7.5	50.3
Greenville 4/					
(S77AL-099-4)	8-20	Bt1	38.1	12.2	49.7
	20-40	Bt2	44.6	9.9	45.5
	40-74	Bt3	43.7	6.1	50.2
Lenoir 1/					
(S79AL-099-14)	0- 4	A	42.4	46.1	11.5
	4- 9	Bt1	31.4	39.0	29.6
	9-23	Bt2	22.8	38.6	38.6
	23-42	Btg1	20.3	35.6	44.1
	42-66	Btg2	16.3	30.4	53.3
Lucedale 5/					
(S69AL-099-1)	0- 8	Ap	51.7	31.5	16.8
	8-13	Bt1	50.1	25.0	24.9
	13-74	Bt2	45.7	20.0	34.3

TABLE 17.--PHYSICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2.0 mm)		
			Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (0.002 mm)
Lucedale 6/					
(S78AL-099-10)	0- 6	Ap	61.8	21.0	17.2
	6-12	AB	47.7	26.6	25.7
	12-23	Bt1	42.7	25.5	31.8
	23-40	Bt2	49.9	18.0	32.1
	40-52	Bt3	56.0	14.1	29.9
	52-64	Bt4	57.7	14.5	27.8
	64-71	Bt5	64.1	11.7	24.2
Lucedale 1/					
(S79AL-099-20)	0- 8	Ap	33.5	42.1	24.4
	8-16	Bt1	46.3	32.6	21.1
	16-28	Bt2	41.1	27.7	31.2
	28-42	Bt3	41.4	24.2	34.4
	42-68	Bt4	45.2	20.0	34.8
Lucedale 7/					
(S79AL-099-24)	0-10	Ap	63.4	24.2	12.4
	10-17	Bt1	47.1	20.9	32.0
	17-30	Bt2	48.6	19.7	31.7
	30-44	Bt3	49.3	18.1	32.6
	44-70	Bt4	53.0	12.1	34.9
	70-80	Bt5	56.5	8.6	34.9
Luverne 1/					
(S79AL-099-26)	0- 4	Ap	60.3	27.0	12.7
	4-16	Bt1	27.2	14.5	58.3
	16-26	Bt2	24.8	18.1	57.1
	26-50	C1	34.1	24.0	41.9
	50-72	C2	24.8	34.6	40.6
Malbis 1/					
(S79AL-099-21)	0- 9	A	47.8	41.5	10.7
	9-19	Bt1	45.6	25.6	28.8
	19-33	Bt2	40.0	30.4	29.6
	33-43	Btv1	41.2	23.1	35.7
	43-73	Btv2	41.8	19.2	39.0
Malbis 8/					
(S79AL-099-23)	0-10	Ap	64.9	23.9	11.2
	10-19	Bt1	50.3	28.5	21.2
	19-31	Bt2	49.9	25.0	25.1
	31-43	Btv1	57.8	6.1	36.1
	43-72	Btv2	51.6	19.7	28.7
Malbis 9/					
(S79AL-099-25)	0- 8	Ap	59.5	29.0	11.5
	8-19	Bt1	50.6	24.4	25.0
	19-32	Bt2	56.2	20.1	23.7
	32-44	Bt3	57.9	15.3	26.8
	44-54	Btv1	56.7	14.4	28.9
	54-72	Btv2	55.2	11.0	33.8
Poarch 1/					
(S79AL-099-16)	0- 4	A	48.0	44.5	7.5
	4-11	BE	49.8	40.8	9.4
	11-25	Bt1	46.0	40.0	14.0
	25-34	Bt2	40.7	38.7	20.0
	34-53	Btv1	36.4	33.6	30.0
	53-72	Btv2	35.9	36.9	27.2

TABLE 17.--PHYSICAL ANALYSIS OF SELECTED SOILS--Continued

1/ See the section "Soil Series and Their Morphology" for pedon location. These are the typical pedons for the soil series in this survey area and the typical pedon for the official Beatrice and Chrysler series.

2/ About 0.5 mile south of the Alabama River and Waller's Creek at Eureka Landing; 1,600 feet north and 2,500 feet east of the southeast corner of sec. 17, T. 5 N., R. 4 E.

3/ About 6.0 miles north of Monroeville, 200 feet north and 980 feet west of the southeast corner of sec. 3, T. 7 N., R. 7 E.

4/ About 2.2 miles south of Midway; 1,500 feet south and 400 feet east of the northwest corner of sec. 10, T. 8 N., R. 10 E.

5/ Near Ollie; 240 feet south and 1,200 feet west of the northeast corner of sec. 23, T. 6 N., R. 7 E.

6/ About 5 miles north of Monroeville; 700 feet north and 50 feet east of the southwest corner of sec. 1, T. 7 N., R. 7 E.

7/ About 4 miles southwest of Palmer's Crossroads; 1,300 feet south and 2,040 feet east of the northwest corner of sec. 30, T. 4 N., R. 5 E.

8/ About 3.5 miles southeast of Chrysler; 2,340 feet south and 657 feet east of the northwest corner of sec. 34, T. 4 N., R. 4 E.

9/ About 3.75 miles southwest of Palmer's Crossroads; 1,300 feet south and 1,440 feet west of the northeast corner of sec. 30, T. 4 N., R. 5 E.

TABLE 18.--CHEMICAL ANALYSIS OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases			Extractable acidity	Base saturation	Reaction	Cation exchange capacity
			Ca	Mg	K				
			Meg/100g				PCT	pH	
Arundel 1/									
(S78AL-099-1)	0- 5	A	3.38	1.18	0.19	7.28	39.50	4.3	12.03
	5-18	Bt1	1.92	1.40	0.17	28.64	10.90	3.9	32.14
	18-22	Bt2	1.32	1.18	0.18	31.12	7.94	4.1	33.80
Beatrice 1/									
(S79AL-099-13)	0- 3	Ap	3.32	1.18	0.05	2.48	64.76	5.8	7.03
	3-16	Bt1	0.84	1.40	0.10	28.80	7.55	5.0	31.15
	16-24	Bt2	0.30	1.37	0.11	27.20	6.17	4.9	28.99
	24-41	Bt3	0.26	1.41	0.14	30.48	5.63	5.0	32.29
	41-50	BC	0.32	1.39	0.15	13.28	12.35	4.6	15.15
	50-72	C	0.58	1.82	0.27	30.96	7.97	4.6	33.64
Chrysler 1/									
(S79AL-099-18)	0- 7	Ap	1.08	0.16	0.07	2.24	36.95	5.2	3.55
	7-14	Bt1	0.58	0.66	0.07	3.52	27.24	5.0	4.83
	14-27	Bt2	0.28	0.74	0.04	3.84	21.77	5.2	4.90
	27-72	Bt3	0.20	0.77	0.04	4.96	16.98	5.0	5.97
Escambia 1/									
(S79AL-099-22)	0- 9	Ap	0.15	0.05	0.02	4.08	5.08	4.5	4.30
	9-18	Bt1	0.10	0.03	0.01	2.72	4.68	4.5	2.85
	18-28	Bt2	0.14	0.07	0.01	3.12	6.82	4.7	3.35
	28-43	Btv1	0.16	0.11	0.02	4.72	5.65	4.9	5.00
	43-61	Btv2	0.16	0.12	0.04	7.52	4.08	4.7	7.84
Esto 1/									
(S79AL-099-15)	0- 4	A	0.54	0.19	0.09	3.36	19.67	4.5	4.18
	4-10	Bt1	0.18	0.21	0.03	3.68	10.51	4.7	4.11
	10-19	Bt2	0.16	0.30	0.03	4.96	9.02	4.9	5.45
	19-50	Bt3	0.14	0.24	0.02	5.04	7.60	4.8	5.45
	50-61	Bt4	0.16	0.16	0.02	5.04	6.50	4.9	5.39
	61-78	C	0.16	0.10	0.02	3.68	7.23	4.8	3.96
Greenville 2/									
(S77AL-099-3)	0- 3	A	4.26	0.78	0.20	3.60	59.32	5.7	8.85
	3- 6	A/B	2.18	0.52	0.15	3.60	44.25	5.9	6.45
	6-10	Bt1	1.58	0.91	0.15	3.36	44.10	5.3	6.01
	10-18	Bt2	0.86	1.21	0.26	4.40	34.70	5.2	6.73
	18-75	Bt3	1.38	0.46	0.08	3.72	33.84	5.3	5.61
	70-75	---	1.56	0.29	0.03	3.84	32.93	5.4	5.72
Greenville 3/									
(S77AL-099-4)	8-20	Bt1	0.18	0.52	0.03	4.16	15.02	4.9	4.89
	20-40	Bt2	0.14	0.16	0.02	5.60	5.47	4.8	5.92
	40-74	Bt3	0.12	0.09	0.02	5.76	3.98	4.7	5.99
Lenoir 1/									
(S79AL-099-14)	0- 4	A	0.40	0.20	0.05	4.24	13.50	4.6	4.90
	4- 9	Bt1	0.22	0.35	0.02	4.88	10.80	4.8	5.47
	9-23	Bt2	0.18	0.48	0.02	5.44	11.29	5.0	6.13
	23-42	Btg1	0.18	0.70	0.03	10.48	8.70	5.1	11.40
	42-66	Btg2	0.32	1.29	0.05	12.48	11.44	5.1	14.54
Lucedale 4/									
(S69AL-099-1)	0- 8	Ap	2.68	0.54	0.24	4.48	43.60	5.2	7.94
	8-13	Bt1	2.32	0.47	0.13	3.20	47.70	5.1	6.12
	13-74	Bt2	2.20	0.44	0.07	3.60	43.00	4.5	6.31
	72	---	0.28	0.25	0.04	4.24	20.20	5.4	4.81

TABLE 18.--CHEMICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases			Extractable acidity	Base saturation	Reaction	Cation exchange capacity
			Ca	Mg	K				
			Meq/100g				PCT	pH	
Lucedale 5/ (S78AL-099-10)	0- 6	Ap	2.60	0.60	0.1	7.00	32.00	5.6	10.30
	6-12	AB	2.80	0.80	---	7.80	32.00	5.5	11.40
	12-23	Bt1	2.20	1.20	---	6.10	36.00	5.5	9.60
	23-40	Bt2	0.40	0.90	---	5.60	19.00	5.0	6.90
	40-52	Bt3	0.20	0.70	---	4.40	17.00	4.9	5.30
	52-64	Bt4	0.10	0.30	---	3.90	11.00	5.3	4.40
	64-71	Bt5	0.10	0.20	---	3.20	9.00	5.6	3.50
Lucedale 1/ (S79AL-099-20)	0- 8	Ap	7.90	1.50	0.50	6.48	41.08	5.4	15.70
	8-16	Bt1	2.10	0.50	0.40	3.84	29.80	5.5	6.70
	16-28	Bt2	2.20	0.50	0.30	4.00	40.00	5.3	5.60
	28-42	Bt3	1.30	0.40	0.10	4.80	26.08	5.1	5.00
	42-68	Bt4	0.50	0.40	0.10	4.88	14.49	4.9	5.00
Lucedale 6/ (S79AL-099-24)	0-10	Ap	2.00	0.81	0.22	3.36	47.35	5.9	6.38
	10-17	Bt1	1.55	0.59	0.14	3.76	37.78	5.2	6.04
	17-30	Bt2	1.24	0.71	0.08	4.56	30.80	5.1	6.59
	30-44	Bt3	0.50	0.52	0.04	5.04	17.52	5.0	6.11
	44-70	Bt4	0.26	0.31	0.03	5.28	10.24	5.1	5.88
	70-80	Bt5	0.11	0.36	0.02	4.88	9.04	5.4	5.36
Luverne 1/ (S79AL-099-26)	0- 4	Ap	0.44	0.60	0.08	6.56	14.58	4.9	7.68
	4-16	Bt1	0.12	2.92	0.24	15.20	17.75	4.9	18.48
	16-26	Bt2	0.08	2.08	0.24	19.84	10.79	4.8	22.24
	26-50	C1	0.08	1.64	0.20	23.12	7.67	4.5	25.04
	50-72	C2	0.08	1.76	0.20	22.24	8.40	4.3	24.28
Malbis 1/ (S79AL-099-21)	0- 9	A	1.40	0.44	0.08	6.64	22.43	4.9	8.56
	9-19	Bt1	0.72	0.36	0.04	4.80	18.92	4.8	5.92
	19-33	Bt2	0.20	0.16	0.04	5.84	6.41	4.8	6.24
	33-43	Btv1	0.16	0.20	0.04	5.92	6.33	4.9	6.32
	43-73	Btv2	0.16	0.20	0.04	4.80	7.69	5.1	5.20
Malbis 7/ (S79AL-099-23)	0-10	Ap	0.24	0.08	0.04	3.68	8.91	4.4	4.04
	10-19	Bt1	0.96	0.32	0.04	4.88	21.29	4.7	6.20
	19-31	Bt2	1.12	0.24	0.04	5.28	20.96	4.8	6.68
	31-43	Btv1	0.16	0.28	0.04	5.76	7.69	5.0	6.24
	43-72	Btv2	0.27	0.29	0.02	5.68	9.13	5.0	6.25
Malbis 8/ (S79AL-099-25)	0- 8	Ap	1.10	0.32	0.10	4.32	26.07	4.8	5.84
	8-19	Bt1	0.82	0.22	0.07	5.12	17.75	5.0	6.23
	19-32	Bt2	0.43	0.22	0.03	4.96	11.94	4.8	5.63
	32-44	Bt3	0.27	0.21	0.03	5.60	8.34	4.8	6.11
	44-54	Btv1	0.22	0.20	0.03	6.00	6.99	4.6	6.45
	54-72	Btv2	0.16	0.23	0.02	5.60	6.97	4.7	6.02
Poarch 1/ (S79AL-099-16)	0- 4	A	0.24	0.10	0.04	6.32	5.75	4.1	6.70
	4-11	BE	0.14	0.02	0.09	4.40	3.76	4.6	4.57
	11-25	Bt1	0.14	0.06	0.01	2.88	6.87	4.8	3.09
	25-34	Bt2	0.14	0.11	0.01	5.60	4.62	4.9	5.87
	34-53	Btv1	0.16	0.15	0.01	5.76	5.29	5.0	6.08
	53-72	Btv2	0.12	0.10	0.09	4.16	5.25	5.0	4.39

TABLE 18.--CHEMICAL ANALYSIS OF SELECTED SOILS--Continued

1/ See the section "Soil Series and Their Morphology" for pedon location. These are the typical pedons for the soil series in this survey area. For the Beatrice and Chrysler series, it is the typical pedon for the official series.

2/ About 6.0 miles north of Monroeville; 200 feet north and 980 feet west of the southeast corner of sec. 3, T. 7 N., R. 7 E. The 70- to 75-inch depth sample is a subsample of the Bt3 horizon; it was taken specifically to determine base saturation at this depth.

3/ About 2.2 miles south of Midway; 1,500 feet south and 400 feet east of the northwest corner of sec. 10, T. 8 N., R. 10 E.

4/ Near Ollie; 240 feet south and 1,200 feet west of the northeast corner of sec. 23, T. 6 N., R. 7 E. The 72-inch depth sample is a subsample of the Bt2 horizon; it was taken specifically to determine base saturation at this depth.

5/ About 5 miles north of Monroeville; 700 feet north and 50 feet east of the southwest corner of sec. 1, T. 7 N., R. 7 E.

6/ About 4 miles southeast of Palmer's Crossroads; 1,300 feet south and 2,040 feet east of the northwest corner of sec. 30, T. 4 N., R. 5 E.

7/ About 3.5 miles southeast of Chrysler; 2,340 feet south and 675 feet east of the northwest corner of sec. 34, T. 4 N., R. 4 E.

8/ About 3.75 miles southwest of Palmer's Crossroads; 1,300 feet south and 1,440 feet west of the northeast corner of sec. 30, T. 4 N., R. 5 E.

TABLE 19.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon and depth in inches	Classification		Grain-size distribution										Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--							Percentage smaller than--					Max-dry density	Optimum Moisture
	AASHTO	Unified	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm				
													PCT		Lb/Ft3	PCT
Beatrice 1/ (S79AL-099-13)																
Ap -- 0 to 3	A-4	ML	100	100	100	99	94	90	76	---	---	---	29	7	105	15
Bt2 -- 16 to 24	A-7-5	MH	100	100	100	100	100	99	98	---	88	---	71	29	88	29
C -- 50 to 72	A-7-5	MH	100	100	100	100	100	100	99	---	92	---	77	39	89	26
Chrysler 1/ (S79AL-099-18)																
A -- 0 to 7	A-4	CL-ML	100	100	100	99	99	96	69	---	30	---	25	5	102	16
Bt2 -- 14 to 27	A-7-5	MH	100	100	100	100	100	97	96	---	---	---	62	29	94	24
Malbis 2/ (S79AL-099-27)																
Ap -- 0 to 7	A-4	ML	100	100	100	98	97	91	56	---	31	---	20	2	110	13
Bt2 -- 10 to 25	A-4	CL-ML	100	100	100	97	95	89	55	---	40	---	21	5	120	12
Btv2-- 43 to 72	A-4	CL-ML	100	100	100	99	98	93	58	---	36	---	31	7	112	14

1/ See the section "Soil Series and Their Morphology" for pedon location. These are the typical pedons for the official soil series.

2/ About 1.8 miles south of Megargel; 1,500 feet south and 2,400 feet west of the northeast corner of sec. 35, T. 5 N., R. 6 E.

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Arundel	Clayey, montmorillonitic, thermic Typic Hapludults
Atmore	Coarse-loamy, siliceous, thermic Plinthic Paleaquults
Bama	Fine-loamy, siliceous, thermic Typic Paleudults
Beatrice	Clayey, montmorillonitic, thermic Vertic Hapludults
Benndale	Coarse-loamy, siliceous, thermic Typic Paleudults
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Bigbee	Thermic, coated Typic Quartzipsamments
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
Chrysler	Clayey, mixed, thermic Aquic Paleudults
Congaree	Fine-loamy, mixed, nonacid, thermic Typic Udifluvents
Escambia	Coarse-loamy, siliceous, thermic Plinthaquic Paleudults
Esto	Clayey, kaolinitic, thermic Typic Paleudults
Grady	Clayey, kaolinitic, thermic Typic Paleaquults
Greenville	Clayey, kaolinitic, thermic Rhodic Paleudults
Halso	Clayey, montmorillonitic, thermic Aquic Hapludults
Iuka	Coarse-loamy, siliceous, acid, thermic Aquic Udifluvents
Izagora	Fine-loamy, siliceous, thermic Aquic Paleudults
Lenoir	Clayey, mixed, thermic Aeric Paleaquults
Lucedale	Fine-loamy, siliceous, thermic Rhodic Paleudults
Lucy	Loamy, siliceous, thermic Arenic Paleudults
Luverne	Clayey, mixed, thermic Typic Hapludults
Malbis	Fine-loamy, siliceous, thermic Plinthic Paleudults
Mantachie	Fine-loamy, siliceous, acid, thermic Aeric Fluvaquents
Poarch	Coarse-loamy, siliceous, thermic Plinthic Paleudults
Prim	Loamy-skeletal, carbonatic, thermic, shallow Typic Rendolls
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
Smithton	Coarse-loamy, siliceous, thermic Typic Paleaquults
Stough	Coarse-loamy, siliceous, thermic Fragiaquic Paleudults
Troup	Loamy, siliceous, thermic Grossarenic Paleudults
Udorthents	Loamy, thermic Typic Udorthents
Una	Fine, mixed, acid, thermic Typic Haplaquepts
Urbo	Fine, mixed, acid, thermic Aeric Haplaquepts

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