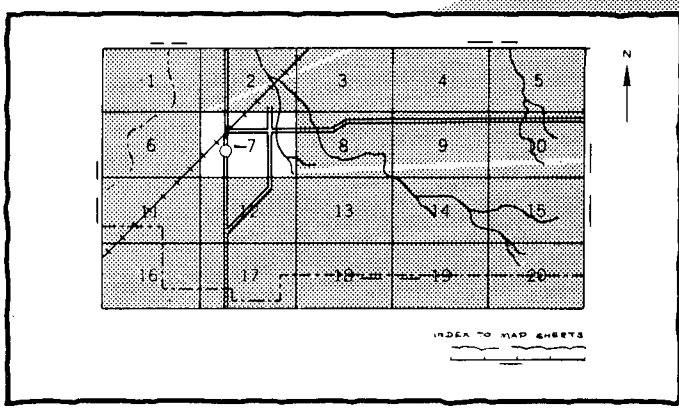
SOIL SURVEY OF

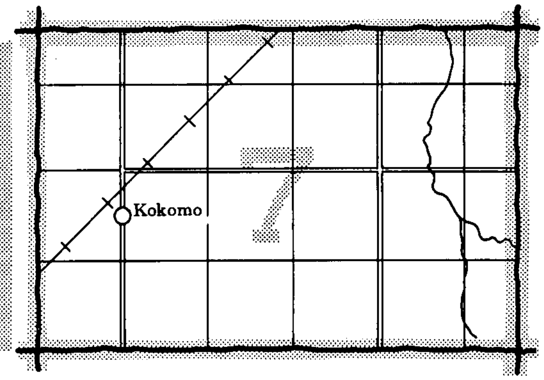
Lafayette County, Mississippi

United States Department of Agriculture
Soil Conservation Service and Forest Service
in cooperation with
Mississippi Agricultural and Forestry Experiment Station

HOW TO USE

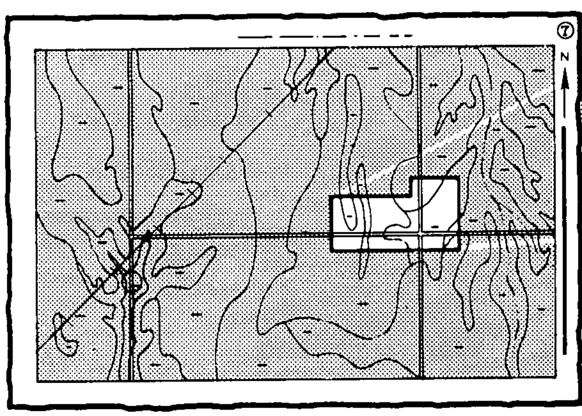
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

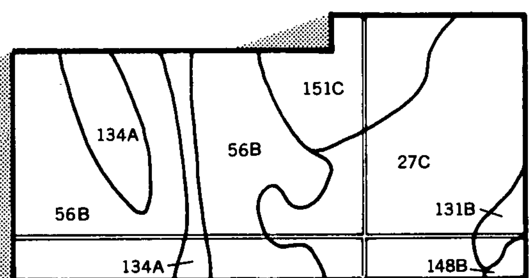




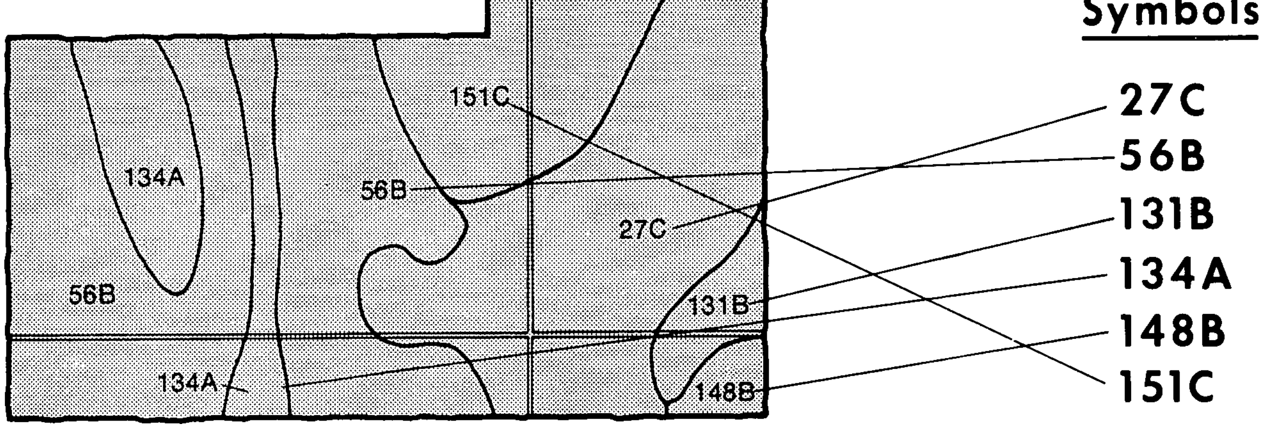
2. Note the number of the map sheet and turn to that sheet.

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



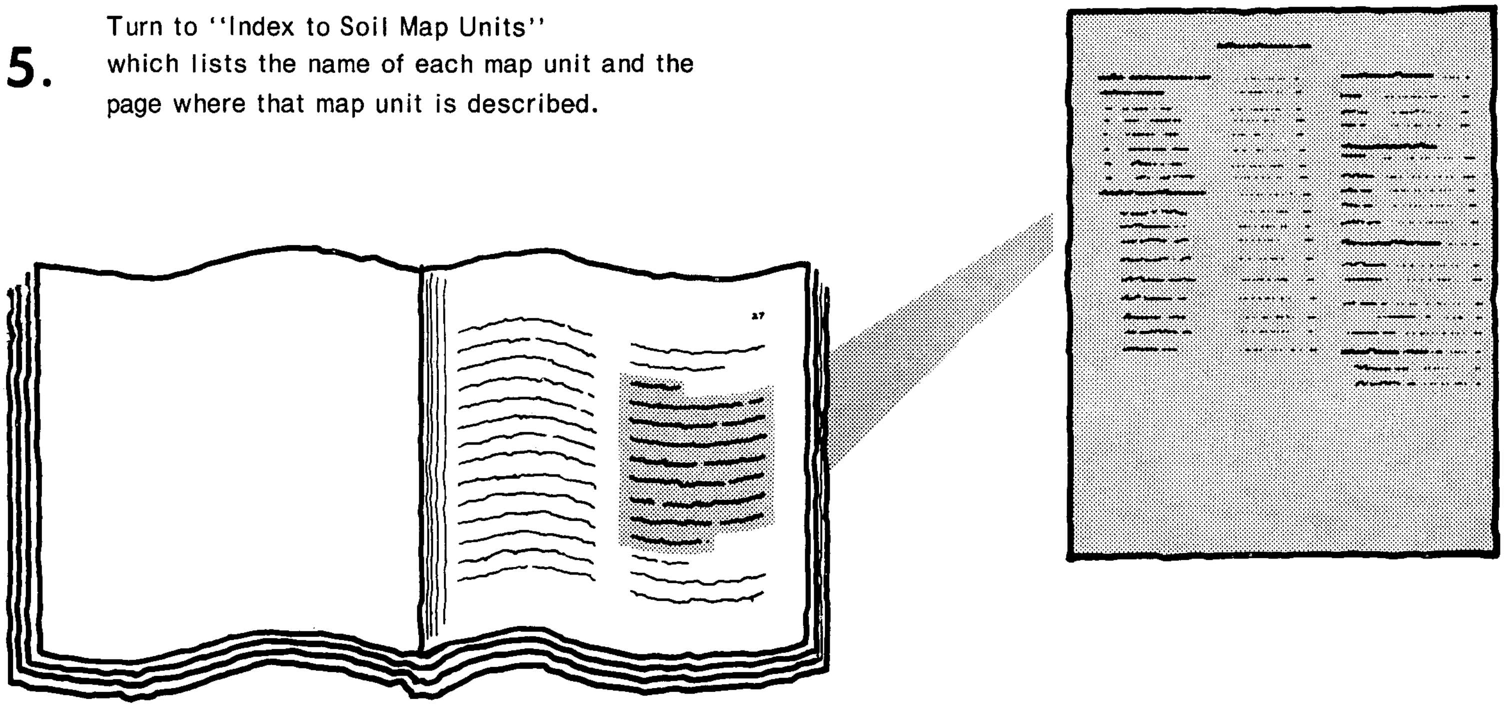


4. List the map unit symbols that are in your area

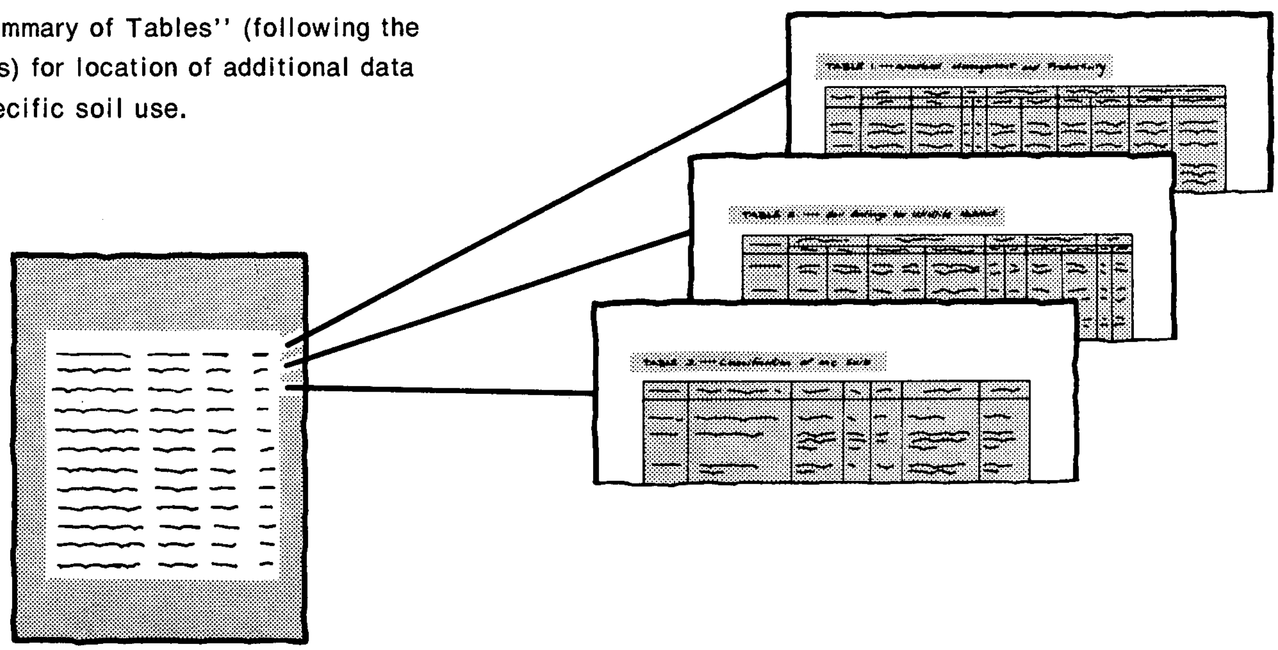


THIS SOIL SURVEY

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; for 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 performed in the period 1975-78. Soil names and descriptions were approved in 1979. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1979. This survey was made cooperatively by the Soil Conservation Service, the Forest Service, and the Mississippi Agricultural and Forestry Experiment Station. It is part of the technical assistance furnished to the Lafayette 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.

Cover: Cotton growing on Cascilla silt loam, occasionally flooded.

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Issued May 1981

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foreword

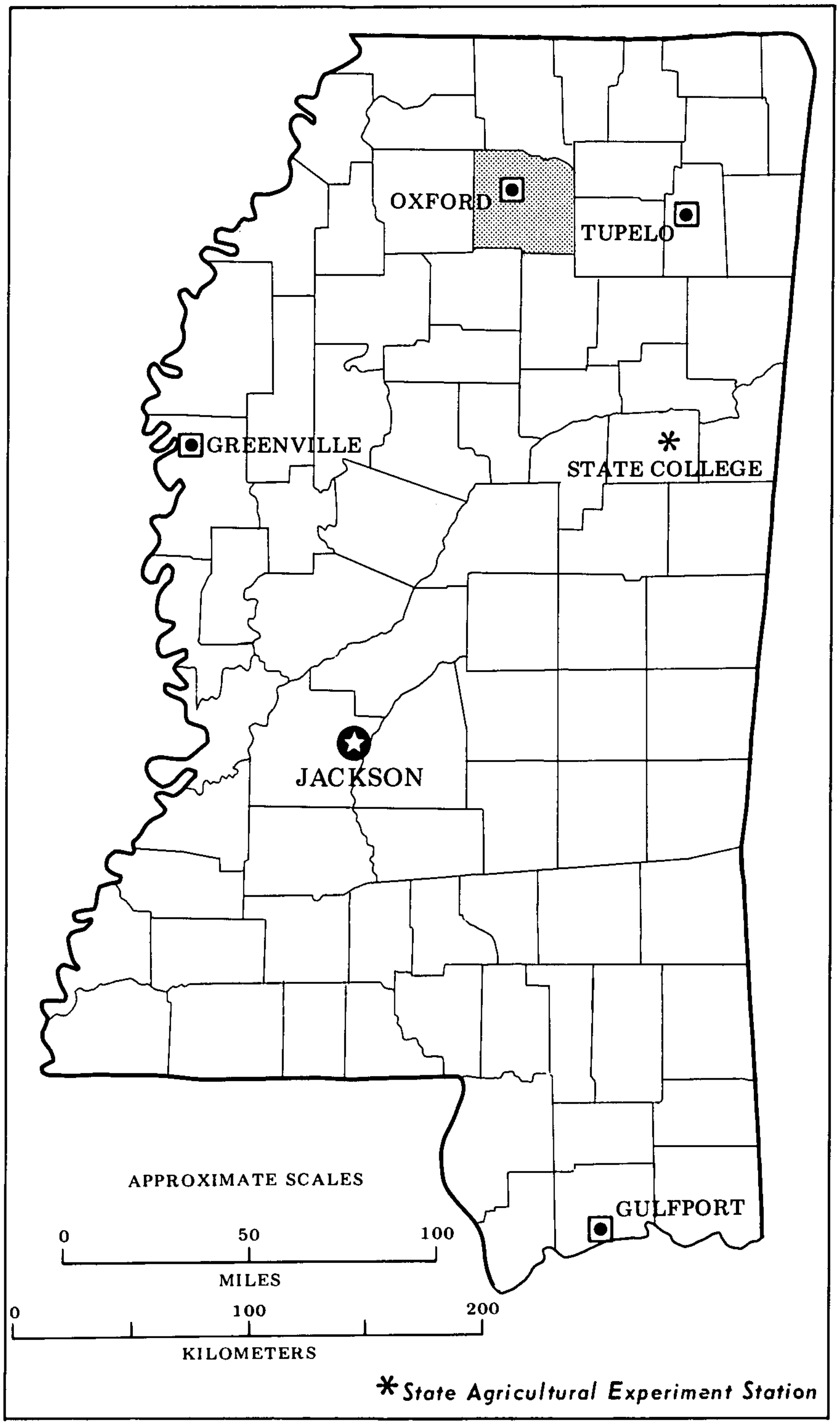
This soil survey contains information that can be used in land-planning programs in Lafayette County, Mississippi. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations,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

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to 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.

Chester F. Bellard
State Conservationist
Soil Conservation Service



Location of Lafayette County in Mississippi.

soil survey of
Lafayette County, Mississippi

By William M. Morris, Jr., Soil Conservation Service

Fieldwork by William M. Morris, Jr., Addison H. Wynn, Jr., and Mary L. Spann, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service and Forest Service, in cooperation with the Mississippi Agricultural and Forestry Experiment Station

LAFAYETTE COUNTY is in the north-central part of Mississippi. It has a land area of 409,160 acres, or about 639 square miles. The total area, including bodies of water of more than 40 acres, is 434,560 acres. Oxford, the county seat, is near the center of of the county. The population of the county in 1970 was about 24,000.

Lafayette County is hilly and has narrow ridges that are characterized by deeply entrenched drainageways. Soils on the ridges are dominantly silty and well drained to moderately well drained. Soils on the steep hills in the western two-thirds of the county are well drained and loamy or loamy and sandy. The erosion hazard is generally severe in this area. In the eastern third of the county, soils on the steep hills are dominantly well drained and many are clayey.

Farming is the main source of income in the county. The climate is favorable for growing most cash grain crops and raising livestock. The major crops are cotton, corn, and soybeans. Beef cattle are the main type of livestock. Industries include the manufacturing of electric motors, electrical appliances, and wood products.

An older soil survey of Lafayette County was published in 1914 (*7*). This soil survey updates the information and supplies larger maps that show the soils in greater detail.

The descriptions, names, and delineations of soils in this survey do not fully agree with those on soil maps for adjacent counties. Differences are the result of better knowledge of soils, modification in series concepts, intensity of mapping, or the extent of soils within the survey.

general nature of the survey area

This section provides information of general interest about the county. It discusses briefly climate, settlement and development, physiography, geology, relief and drainage, and farming of the area.

climate

Lafayette County has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short, with only a rare cold wave that moderates in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation, mainly afternoon thundershowers, is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area, as recorded at University, Mississippi, for the period 1951 to 1973. 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 43 degrees F, and the average daily minimum temperature is 32 degrees. The lowest temperature on record, which occurred at University on January 30, 1966 is -11 degrees. In summer the average temperature is 78 degrees, and the average daily maximum temperature is 90 degrees. The highest recorded temperature, which occurred on July 27, 1952, is 108 degrees.

Growing degree days, shown in table 1, 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.

Of the total annual precipitation, 25 inches, or 50 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 20 inches. The heaviest 1-day rainfall during the period of record was 6.66 inches at University on November 28, 1968. Thunderstorms occur on about 60 days of each year, and most occur in summer.

Average seasonal snowfall is 4 inches. The greatest snow depth at any one time during the period of record was 7 inches. On the average, 1 day will have at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The percentage of possible sunshine is 70 in summer and 50 in winter. The prevailing wind is from the south. Average windspeed is highest, 11 miles per hour, in winter.

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

Climatic data for this section were especially prepared for the Soil Conservation Service by the National Climatic Center, Ashville, North Carolina.

settlement and development

The area that is now Lafayette County was organized in February 1836 from land ceded by the Chickasaw Indians in the Treaty of Pontotoc in 1832. Oxford has been the county seat since 1836.

Early settlements included Oxford in the center of the county and Eton and Wyatt along the Little Tallahatchie River. The settlers came mostly from North Carolina, South Carolina, Virginia, Georgia, and Alabama. Early settlement was concentrated in the northwest quarter of the county on the Little Tallahatchie River, which provided a water route to transport goods.

Oxford was chosen as the site of the University of Mississippi by the legislature in 1841. In 1844 the University was granted a charter, and its doors were opened to students in 1848.

The population of the county in 1840 was 6,531, and by 1970 it had increased to 24,181.

physiography

Mississippi lies mostly within the East Gulf Coastal Plain physiographic region, and Lafayette County is entirely within the North Central Hills physiographic division of the state. This area consists of hills dissected by a well developed, dendritic (irregularly branched) drainage system and nearly level strips of bottom land along the rivers and creeks. Ridgetops are generally narrow and are covered with a thin mantle of silty material (loess) ranging in thickness from a few inches to several feet. The steep slopes consist of loamy and clayey material. Flood plains are relatively wide and silty, especially along the major streams.

geology

The bedrock of Lafayette County mainly consists of the Claiborne and Wilcox Groups of the Eocene Epoch. In many areas, this bedrock was covered with loess during the Pleistocene Epoch. The loess mantle is thickest on nearly level portions of the landscape in the western part of the county, and it thins out toward the eastern part. Also, during the Pleistocene and in recent times the bedrock was covered with alluvium in the valleys of the Yocona and Little Tallahatchie Rivers and their major tributaries.

The Wilcox Group consists of the Ackerman and Fern Springs Formations. The Ackerman Formation is more than 350 feet thick. It lies unconformably on the Fern Springs Formation, which is more than 150 feet thick. Both formations consist of sand, clay, silt, iron ore, and lignite. The Wilcox Group crops out in the eastern third of Lafayette County, and elsewhere it is overlain by the Claiborne Group (*21*).

The Claiborne Group consists of the Meridian, Tallahatta, and Kosciusko Formations. The Meridian Formation is more than 100 feet thick. It lies unconformably on the Ackerman and Fern Springs Formations of the Wilcox Group. The Tallahatta Formation consists of sands, clays, clay shale, and siltstone and is more than 50 feet thick. It lies conformably on the Meridian Formation. The Kosciusko Formation consists of sand and sandstone and is about 40 feet thick. It lies unconformably on the Tallahatta and Meridian Formations.

relief and drainage

Lafayette County is mostly 400 to 600 feet above sea level. The highest point is 623 feet at Thacker Mountain, about 3 miles southwest of Oxford. The lowest elevation is along Enid Reservoir, where the normal pool elevation is about 230 feet and the spillway crest has an elevation of 268 feet.

Lafayette County is drained by the Little Tallahatchie and Yocona Rivers, which are tributaries of the Yazoo River. The Little Tallahatchie River and its tributaries flow westward and drain approximately the northern half of the county. The Yocona River and its tributaries also flow westward and drain the southern part of the county.

farming

Early in the history of the county, crops of importance were cotton, corn, wheat, oats, and potatoes. In 1840 only 1,000 bales of cotton were produced in the county, but by 1860, 19,282 bales were produced. Most early farms were less than 250 acres, but by 1969, the majority of farms were less than 179 acres.

Dairying was an important early industry, but it has declined. Between 1965 and 1975 the number of dairy cattle in the county dropped from 1,500 to 350. During this same period the number of beef cattle increased from 13,700 to 21,700.

Between 1969 and 1976, land in cotton decreased from 11,371 acres to 7,100 acres. As cotton declined in importance, soybeans increased—from 7,505 acres in 1969 to 13,000 acres in 1976. Corn also decreased, from 4,274 acres in 1969 to 2,100 acres in 1976.

The census of 1860 listed 1,044 farms in the county. In 1969 there were only 948 farms, and by 1974 the number had declined to 694. In 1974 many farmers listed their principal occupation as other than farming. The average size of farms changed very little between 1969 and 1974.

Forests cover a large part of Lafayette County, where 259,200 acres is classified as commercial forest. Between 1958 and 1967 forest acreage increased from 190,200 acres to 205,100 acres.

The Yazoo-Little Tallahatchie Flood Prevention Project, under the United States Department of Agriculture, Soil Conservation Service and Forest Service, was responsible for planting some 83,500 acres to trees between 1948 and 1977. The trees, mainly loblolly pine, were planted on eroded hilly land to control erosion and produce timber.

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

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 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 potential for major land uses. Soil potential 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, woodland, urban uses,* and *wildlife habitat*. Cultivated crops are those grown extensively in the survey area. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments. Types of wildlife habitat rated include openland, woodland, and wetland. Soil names and delineations of the map units on the general soil map of Lafayette County do not fully agree with those on general soil maps for adjacent counties. Differences are the result of better knowledge of soils, modifications of series concepts, or differences in the extent of soils in the adjacent counties.

descriptions of the map units

1. Maben-Smithdale-Tippah

Gently sloping to steep, well drained to moderately well drained loamy and silty soils; on upland ridgetops and side slopes

This map unit is in the eastern part of the county. The landscape is hilly with narrow to medium ridgetops and narrow valleys. Slopes range from 2 to 40 percent.

This map unit covers about 19 percent of the county. It is about 38 percent Maben soils, 27 percent Smithdale soils, and 21 percent Tippah soils. The remaining 14 percent is minor soils.

The Maben soils are well drained and steep. They are on side slopes. They formed in stratified layers of shaly clay and loamy material.

The Smithdale soils are well drained and steep. They are on side slopes, and they formed in loamy marine deposits.

The Tippah soils are moderately well drained and gently sloping to sloping. They are on ridgetops, and they formed in a thin mantle of silty loess underlain by clay.

The minor soils in this unit include the somewhat poorly drained Wilcox soils and the well drained Lucy soils on hillsides, the well drained Lexington soils and the moderately well drained Providence soils on ridges, and the somewhat poorly drained Arkabutla and Chenneby soils on narrow flood plains.

The soils of this map unit are used mostly for woodland. Some small areas on ridgetops and side slopes are used for pasture and row crops. These soils are poorly suited to row crops because of steep slopes, rapid runoff, and a severe erosion hazard. Because they have steep slopes and rapid runoff, the Maben and Smithdale soils are poorly suited to pasture. The gently sloping to sloping Tippah soils, however, are well suited to pasture.

The soils of this unit are moderately suited to woodland. The use of equipment on the Maben soils is moderately limited by poor trafficability. Plant competition is moderate on the Smithdale and Tippah soils.

The wetness and high shink-swell properties of the Maben and Tippah soils and the steep slopes of the Smithdale soils are severe limitations for urban uses. The low strength of the Maben and Tippah soils severely limits their use for streets and roads.

These soils have good potential for openland and woodland wildlife habitat but have poor potential for wetland wildlife habitat.

2. Smithdale-Lucy-Lexington

Gently sloping to steep, well drained loamy, sandy, and silty soils; on winding upland ridgetops and side slopes

This map unit is in the central and western parts of the county. The hilly landscape is broken by narrow, winding ridgetops and valleys. Slopes range from 2 to 40 percent.

This map unit covers about 41 percent of the county. It is about 50 percent Smithdale soils, 17 percent Lucy soils, and 9 percent Lexington soils. The remaining 24 percent is minor soils.

The Smithdale soils are well drained and steep and are on side slopes. They formed in loamy marine deposits.

Lucy soils are well drained, sandy, and steep. They are on the middle and lower parts of side slopes. They formed in thick beds of loamy marine deposits.

The Lexington soils are well drained and are on ridges. They formed in a thin mantle of silty loess underlain by loamy material.

The minor soils in this unit are the well drained Maben soils on side slopes, the moderately well drained Loring and Providence soils on ridges, and the well drained Cascilla and Ochlockonee soils on narrow flood plains.

Most of this map unit is used for woodland. Some small tracts on narrow flood plains and small areas of gently sloping soils on uplands are used for pasture and row crops. Smithdale and Lucy soils are poorly suited to row crops and pasture because of steep slopes and the erosion hazard. Lexington soils are moderately suited to row crops and pasture.

These soils are moderately suited to woodland. Plant competition is moderate on Smithdale and Lexington soils. The use of equipment on Lucy soils is moderately limited, but conventional equipment can be used.

Smithdale and Lucy soils are severely limited for urban uses, mainly by steep slopes (fig. 1). Lexington soils are slightly limited for urban use.

Smithdale and Lucy soils have fair potential for openland wildlife habitat. Lexington soils have good potential for openland wildlife habitat. All of these soils have good potential for woodland wildlife habitat but have poor potential for wetland wildlife habitat.

Figure 1.—Roadbank erosion stabilized by bermudagrass in the Smithdale-Lucy-Lexington map unit.

3. Chenneby-Arkabutla-Cascilla

Nearly level, somewhat poorly drained and well drained silty soils; on flood plains

This map unit is mainly on flood plains of the Little Tallahatchie and Yocona Rivers and their major tributaries. The flood plains are broad and subject to flooding, especially in winter and early in spring. Slopes range from 0 to 2 percent.

This map unit covers about 12 percent of the county. It is about 52 percent Chenneby soils, 33 percent Arkabutla soils, and 10 percent Cascilla soils. The remaining 5 percent is minor soils.

The Chenneby soils are somewhat poorly drained and nearly level. They are on the slightly higher parts of broad flood plains. They formed in silty alluvium.

Arkabutla soils are somewhat poorly drained and nearly level and are on the lower parts of wide flood plains. They formed in silty alluvium.

The Cascilla soils are well drained and are on the higher natural levees along the stream channels and old river runs. They formed in silty alluvium.

The minor soils in this unit are the somewhat poorly drained Gillsburg soils, the well drained Jena soils, and the moderately well drained Kirkville and Oaklimeter soils. They are all on flood plains.

The soils of this map unit are used mostly for row crops and pasture. The lower areas are frequently flooded and are used for woodland. The soils are well suited to row crops and pasture. Soil wetness and flooding are the main limitations for farming and a good drainage system is needed to produce good yields. An occasional flood may cause only slight to moderate damage to crops, but crops in frequently flooded areas can be severely damaged.

The soils of this map unit are well suited to woodland. Although the use of equipment is moderately limited by wetness and flooding, these limitations can be partially offset by logging during the drier seasons.

Soil wetness and flooding are severe limitations for urban uses and are difficult to overcome.

These soils have good potential for openland and woodland wildlife habitat. Chenneby and Arkabutla soils have fair potential for wetland wildlife habitat, and Cascilla soils have poor potential.

4. Ochlockonee-Oaklimeter-Kirkville

Nearly level, well drained or moderately well drained loamy and silty soils; on flood plains

This map unit is on flood plains of major streams mainly in the western part of the county. The flood plains are moderately broad and subject to flooding, especially in winter and early in spring. Slopes range from 0 to 2 percent.

This map unit covers about 5 percent of the county. It is approximately 60 percent Ochlockonee soils, about 18 percent Oaklimeter soils, and about 11 percent Kirkville soils. The remaining 11 percent is minor soils.

The Ochlockonee soils are well drained and are on the higher parts of the flood plains. They formed in stratified layers of loamy material.

The Oaklimeter soils are moderately well drained and are on the lower parts of the flood plains. They formed in silty material.

The Kirkville soils are moderately well drained and are also on the lower parts of the flood plains. They formed in loamy material.

Minor soils in the unit are the well drained Cascilla and Jena soils and the somewhat poorly drained Gillsburg soils. They are all on flood plains.

The soils of this map unit are used mostly for row crops and pasture. The remaining areas are frequently flooded and are used for woodland. These soils are well suited to row crops and pasture. Flooding is the main limitation for farming, and a good surface drainage system is needed. An occasional flood may cause only slight to moderate damage to crops. Some lower areas flood more frequently, however, and crops can be severely damaged.

Soils in this unit are well suited to woodland. Moderate plant competition is the main limitation. There are also moderate limitations to the use of equipment in certain frequently flooded areas.

All of the soils in this unit are severely limited for urban use by the flood hazard.

All of the soils have good potential for openland and woodland wildlife habitat and have poor potential for wetland wildlife habitat.

5. Smithdale-Udorthents

Sloping to steep, well drained loamy soils; on upland ridges and side slopes with many deep, branching gullies

This map unit is in the western part of the county. The landscape is rough and hilly. The narrow ridges and steep side slopes are broken by gullies of various sizes and shapes and by the narrow valleys. Slopes range from 8 to 40 percent.

This map unit covers about 9 percent of the county. The Smithdale soils make up about 45 percent of the unit, and about 34 percent is Udorthents, gullied. The remaining 21 percent is minor soils.

The well drained Smithdale soils are on ridges and steep side slopes. They formed in loamy marine sediments.

Udorthents are in the gullied areas on uplands. These soils have been so severely eroded that the upper soil horizons cannot be identified. Texture is variable but is dominantly loamy with a large amount of sand.

The minor soils of this unit include the well drained Lucy soils on side slopes. Also included, on narrow ridges, are the well drained Lexington soils and the moderately well drained Loring and Providence soils.

Almost all of this unit is used for woodland. A small part is used for pasture.

The soils in this unit are poorly suited to row crops and pasture. Deep, rough gullies and a severe erosion hazard limit the use of the soils for farming and other purposes.

The soils in this map unit are moderately suited to woodland. Udorthents have a severe seedling mortality; but once established, trees have a moderate growth rate. The steep gully walls and the somewhat inaccessable ridges between gullies are severe limitations for woodland management and logging. These limitations can be partially overcome by using special equipment such as long-lead cable hitches and stickloaders.

The soils in this unit are severely limited for urban uses by the rough gullies and steep slopes.

Soils of this map unit have good potential for woodland wildlife habitat but have poor potential for openland and wetland wildlife habitat.

6. Lexington-Loring-Providence

Gently sloping to moderately steep, moderately well drained silty soils with a fragipan and well drained silty soils on upland ridgetops and side slopes

This map unit is scattered throughout most of the county. The landscape is undulating to rolling, with wide, gently sloping to sloping ridgetops and strongly sloping side slopes. Slopes range from 2 to 15 percent.

The map unit covers about 9 percent of the county. It is about 36 percent Lexington soils, 17 percent Loring soils, and 13 percent Providence soils. The remaining 34 percent is minor soils.

The Lexington soils are well drained and are on the higher ridges and side slopes. They formed in a thin mantle of loess over loamy material.

Loring soils, which have a fragipan, are moderately well drained and are on the lower parts of the uplands. They formed in a thick mantle of loess.

Providence soils, which also have a fragipan, are moderately well drained and are on upland ridges and side slopes. They formed in a thin mantle of loess over loamy material.

The minor soils in this unit are mostly moderately well drained Grenada and Tippah soils and somewhat poorly drained Calloway soils on upland ridges and stream terraces. Also included are well drained Smithdale soils on side slopes.

The soils of this map unit are used mostly for row crops and pasture. A small acreage is in woodland. The soils are moderately suited to row crops and pasture. The hazard of erosion is the main limitation. Good cropping systems with contour farming, terraces, and minimum tillage help control erosion.

All of these soils are moderately suited to woodland. The limitations are slight.

The gently sloping Lexington soils are slightly limited for urban use. Loring and Providence soils are moderately limited by wetness and, for streets and roads, by low strength. Proper design and careful installations will offset these limitations.

All of the soils of this unit have good potential for openland and woodland wildlife habitat but have poor potential for wetland wildlife habitat.

7. Providence-Tippah-Maben

Gently sloping to steep, moderately well drained silty soils with a fragipan, moderately well drained silty soils, and well drained loamy soils; on upland ridgetops and side slopes

This map unit is in the eastern part of the county. The landscape is undulating to rolling with gently sloping to sloping ridgetops and strongly sloping to steep side slopes. Slopes range from 2 to 35 percent.

This map unit covers about 5 percent of the county. It is about 43 percent Providence soils, 33 percent Tippah soils, and 13 percent Maben soils. The remaining 11 percent is minor soils.

The Providence soils are moderately well drained and have a fragipan. They formed in a thin mantle of loess underlain by loamy material on ridges.

Tippah soils are moderately well drained and are generally on ridges. They formed in a thin mantle of loess underlain by clay.

The Maben soils are well drained and are on the steeper side slopes. They formed in stratified layers of shaly clay and loamy material.

The minor soils in this unit are mostly well drained Lexington and Smithdale soils on upland ridges and side slopes. Also included are moderately well drained Grenada soils and somewhat poorly drained Calloway soils on upland ridges and stream terraces.

This map unit is used mostly for pasture and woodland. A small part is in row crops. Providence and Tippah soils are moderately suited to row crops. Maben soils are poorly suited to row crops because of steepness of slopes and the severe erosion hazard. All of the soils are well suited to pasture, except for the Maben soils which are poorly suited because of steep slopes and low productivity.

The soils of this unit are moderately suited to woodland. Maben soils have moderate limitations to the use of equipment. This can be offset by logging during the dry periods.

Soil wetness and the high shrink-swell properties of the Maben and Tippah soils are severe limitations for urban uses.

The soils of this unit have good potential for openland and woodland wildlife habitat, but they have poor potential for wetland wildlife habitat.

broad land use considerations

The soils in the survey area vary widely in their suitability for major land uses. Approximately 7 percent of the land in the county is used for cultivated crops. This cropland is scattered throughout the county, but it is mostly concentrated in three general soil map units on soils that are moderately suited or well suited to crops. These are identified as map units 3, 4, and 6 on the general soil map. Map units 3 and 4 are occasionally flooded in winter and in spring. Wetness is the major limitation in growing crops. However, the downstream areas that are affected by Enid Reservoir and Sardis Reservoir are frequently flooded and may have severe crop damage. The principal soils of map units 3 and 4 are in the Arkabutla, Cascilla, Chenneby, Oaklimeter, Ochlockonee, and Kirkville series. Lexington, Loring, and Providence soils are the principal soils of map unit 6. The erosion hazard and steep slopes are the chief limitations to growing crops. However, the gently sloping soils on ridges are well suited to crops, and the sloping soils on ridges are suited to this use.

About 17 percent of the land in the county is in hay and pasture. All of the soils in map units 3, 4, and 7, except Maben soils, are well suited or moderately suited to hay and pasture. Maben soils are poorly suited to this use. Soils in map unit 6 are moderately suited to hay and pasture. The major soils of these map units are Chenneby, Arkabutla, Ochlockonee, and Oaklimeter soils on flood plains and Lexington, Loring, Providence, and Tippah soils on uplands.

Approximately 57 percent of the land in the county is used for woodland. All of the soils in map units 3 and 4 are well suited to this use. All soils in map units 1, 2, 5, 6, and 7 are moderately suited to woodland, except Udorthents, which are poorly suited. Some of the soils have moderate equipment limitations that can be overcome by using special equipment or by logging during dry periods.

About 14,000 acres in the county is urban or built-up areas. The gently sloping to sloping Lexington and Loring soils are slightly to moderately limited for urban use by wetness and for streets and roads by low strength. These soils are in map unit 6. Loring and Providence soils have a fragipan. Their moderately slow permeability severely limits use for septic tank absorption fields. Most of these limitations can be partially overcome by special design, larger absorption fields, and careful installation procedures. The soils of map units 3, 4, 1, and 7 are severely limited for urban use. Map unit 3 is limited by flooding and soil wetness; unit 4 by flooding; and units 1 and 7 by steep slopes, wetness, and high shrink-swell properties. Hilly areas of Smithdale and Lucy soils are severely limited, mainly by steep slopes. Map units 2 and 5 are also in these hilly areas. Sites can often be selected however, that are suitable for dwellings and small commercial buildings.

The limitations for recreation range from slight to severe, depending upon the intensity of the expected use. Map unit 6 is moderately limited for intensive recreational development by the steepness of slopes. Map units 3 and 4 are severely limited by flooding. Map units 1, 2, 5, and 7 are hilly, and steep slopes limit their suitability for intensive recreation. All of these, however, are suitable for extensive recreational uses such as hunting, hiking, or horseback riding. Small areas suitable for intensive recreation can often be selected from within map units that have severe limitations. Suitability for wildlife is discussed in the section "Use and management of the soils."

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, 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, Lexington silt loam, 2 to 5 percent slopes, eroded, is one of several phases in the Lexington series.

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

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. Ochlockonee-Bruno complex, frequently flooded, is an example.

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

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

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

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

soil descriptions

51—Arkabutla silt loam, occasionally flooded. This is a nearly level, somewhat poorly drained soil. It formed in silty alluvium on broad flood plains. This soil is subject to occasional flooding lasting from a few hours to about 2 or 3 days. Flooding occurs in winter or early in spring before crops are planted. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsoil extends to a depth of 60 inches or more. To a depth of about 15 inches, it is yellowish brown silt loam mottled in shades of gray and brown. To a depth of about 22 inches, it is light brownish gray silt loam mottled in shades of brown. The lower part is grayish brown silty clay loam mottled in shades of brown and gray.

This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is high. Runoff is slow, and the erosion hazard is slight. The seasonal high water table is within 1.5 to 2.5 feet of the surface in winter and early in spring.

Included in mapping are small areas of Chenneby, Gillsburg, and Kirkville soils on flood plains. Also included are some small areas of poorly drained silty soils in low depressions.

Most areas of this Arkabutla soil are used as cropland and pasture except for a small acreage in woodland. This soil is well suited to row crops and small grains. Seedbed preparation and cultivation are sometimes delayed by wetness of the soil. Occasional floods may cause slight to moderate damage to crops in wet years. Field ditches are needed and plant rows should be arranged to remove excess surface water. The return of crop residue to the soil improves soil fertility and tilth and increases water infiltration.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Proper stocking, controlled grazing, and weed and brush control improve tilth and reduce compaction.

This soil is well suited to cherrybark oak, eastern cottonwood, green ash, loblolly pine, Nuttall oak, sweetgum, and water oak. Wetness and flooding are the main limitations in managing the woodland and harvesting the tree crop. Logging during the drier seasons helps to overcome these limitations.

This soil is severely limited for urban uses by flooding and wetness. Flooding and wetness also severely limit use for septic tank absorption fields.

This soil is in capability subclass IIw and woodland suitability group 1w8.

18—Arkabutla-Chenneby association, frequently flooded. This unit consists of somewhat poorly drained soils that formed in silty alluvium. These soils are on broad, nearly level flood plains dissected by meandering stream channels and in a few small, shallow sloughs and lakes. Debris, such as uprooted trees, and sediment have partially blocked the natural drainage channels, causing very slow runoff and ponding of water in low places. These soils are usually flooded for periods of a few hours to several weeks in winter and during the crop season (fig. 2). These soils occur in a regular and repeating pattern on the landscape. Individual areas of each soil are large enough to map separately, but because of similar present or predicted uses they were mapped as one unit. Individual mapped areas are relatively wide and long and range from 800 to 2,500 acres. Slopes range from 0 to 2 percent.

Figure 2.—Japanese millet for waterfowl in beaver pond on Arkabutla-Chenneby association, frequently flooded.

The somewhat poorly drained Arkabutla soil is on the lower parts of the flood plain and makes up about 50 percent of the map unit. Typically, the surface layer is dark brown silt loam about 4 inches thick. The upper part of the subsoil, to a depth of about 14 inches, is yellowish brown silt loam with light brownish gray mottles. The lower part to a depth of about 60 inches is light brownish gray silt loam with yellowish brown mottles.

This Arkabutla soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is high. Runoff is very slow, and the erosion hazard is slight. The seasonal high water table is within 1.5 to 2.5 feet of the surface during winter and spring.

The somewhat poorly drained Chenneby soil is on the higher parts of the flood plain and along natural levees of streams. It makes up about 35 percent of the map unit. Typically, the surface layer is dark yellowish brown silt loam about 5 inches thick. The subsoil extends to a depth of about 45 inches. To a depth of about 16 inches, it is dark brown silt loam with grayish brown mottles. To a depth of about 28 inches, it is silt loam mottled in shades of gray and brown. Below that, it is gray silt loam mottled in shades of brown. The underlying material to a depth of 60 inches is gray silt loam mottled in shades of brown.

This Chenneby soil ranges from very strongly acid to medium acid throughout. Permeability is moderate. The available water capacity is high. Runoff is slow, and the erosion hazard is slight. The seasonal high water table is within 1.0 to 2.5 feet of the surface in winter and spring.

About 15 percent of this association consists of small areas of minor soils. These include Cascilla and Oaklimeter soils on the higher natural levee of streams, Gillsburg soils and poorly drained silty and sandy soils in low depressions, soils immediately upstream from major flood control reservoirs which are flooded for longer than a month, and small, higher lying soils which flood less frequently.

Most of the association is in woodland, but some areas are used for row crops and pasture. These soils are poorly suited to row crops because of the frequent flooding. They are moderately suited to growing most grasses and legumes for hay and pasture.

These soils are well suited to cherrybark oak, eastern cottonwood, green ash, Nuttall oak, sweetgum, water oak, and American sycamore. Managing the woodland and harvesting the tree crop are moderately limited by flooding and wetness. These limitations can be partially overcome by logging during the drier periods.

These soils are poorly suited to urban uses because of the frequent flooding and wetness. Septic tank absorption fields are likely to malfunction because the water table is seasonally high.

These soils are in capability subclass IVw and woodland suitability group 1w9.

6A—Calloway silt loam, 0 to 1 percent slopes. This is a somewhat poorly drained, nearly level soil that has a fragipan. It formed in silty material on low ridgetops and terraces.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil extends to a depth of 65 inches or more. To a depth of about 17 inches, it is mottled yellowish brown, light brownish gray, and pale brown silt loam. To a depth of about 21 inches, it is pale brown silt loam mottled in shades of brown. Below this is a firm, brittle, and compact yellowish brown silty clay loam fragipan mottled in shades of gray and brown.

The soil ranges from very strongly acid to medium acid throughout. Permeability is moderate in the upper part of the subsoil and slow in the fragipan. The available water capacity is medium. Runoff is slow, and the erosion hazard is slight. A perched water table is within 1.0 to 2.0 feet of the surface and above the fragipan during periods of heavy rainfall. The surface layer is easily tilled through a medium range of moisture content. It tends to crust and pack after hard rains.

Included in mapping are small areas of Grenada soils on uplands and terraces and small areas of Providence soils on uplands. Also included are small areas of somewhat poorly drained soils that are sandy below a depth of 30 to 48 inches.

Most areas of this Calloway soil are used as cropland and pasture. A small acreage is in woodland. This soil is well suited to row crops and small grains. Proper arrangement of plant rows, grassed waterways, and surface field ditches are needed to remove excess surface water. The return of crop residue to the soils improves soil fertility and tilth and reduces crusting and packing.

This soil is moderately suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction. Proper stocking, controlled grazing, and weed and brush control are needed.

This soil is well suited to cherrybark oak, loblolly pine, shortleaf pine, sweetgum, and water oak. Seasonal wetness limits woodland management and harvesting of the tree crop. This can be partially offset by logging during the dry periods.

This soil is poorly suited to urban uses. Wetness and slow permeability are the main limitations. These limitations can be offset by special design and careful installation of structures. Slow permeability in the fragipan severely limits the use of this soil for septic tank absorption fields.

This soil is in capability subclass IIw and woodland suitability group 2w8.

16—Cascilla silt loam, occasionally flooded. This is a well drained, nearly level soil that formed in silty alluvium on the higher parts of broad flood plains. This soil is subject to occasional flooding lasting from a few hours to about 2 days. Flooding occurs in winter and early in spring before crops are planted. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsoil extends to a depth of 65 inches or more. To a depth of about 28 inches, it is dark yellowish brown silt loam. Below this, it is yellowish brown silt loam mottled in shades of brown and gray.

This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is high. Runoff is slow, and the erosion hazard is slight. The seasonal high water table is more than 6 feet below the surface. The surface layer is friable and easily tilled through a fairly wide range of moisture content. The soil tends to crust and pack after hard rains.

Included in mapping are small areas of Arkabutla, Chenneby, and Jena soils on flood plains. Also included are some small areas of well drained soils that are coarse-silty.

Most areas of this Cascilla soil are used as cropland and pasture. The soil is well suited to crops (fig. 3) and small grains. Field ditches are needed and plant rows should be arranged to remove excess surface water. The return of crop residue to the soil improves soil fertility and tilth and reduces crusting and packing.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes poor tilth and surface compaction. Proper stocking, controlled grazing, and weed and brush control reduce compaction.

Cascilla soil is well suited to cherrybark oak, eastern cottonwood, loblolly pine, water oak, sweetgum, and yellow-poplar. Woodland management limitations are slight.

Figure 3.—Soybeans growing on Cascilla silt loam, occasionally flooded.

This soil is severely limited for urban uses by the flood hazard. Flooding and wetness also severely limit use for septic tank absorption fields.

This soil is in capability subclass IIw and woodland suitability group 1o7.

10—Chenneby silt loam, occasionally flooded. This is a somewhat poorly drained, nearly level soil that formed in silty alluvium on broad flood plains. This soil is subject to occasional flooding lasting from a few hours to about 2 or 3 days. Flooding occurs in winter or early in spring before crops are planted. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil extends to a depth of 46 inches. To a depth of about 18 inches, it is dark brown silt loam. To a depth of about 31 inches, it is yellowish brown silty clay loam mottled in shades of gray and brown. Below this is silt loam mottled in shades of gray and brown. The underlying material to a depth of 65 inches is light brownish gray silt loam mottled in shades of brown.

This soil ranges from very strongly acid to medium acid throughout. Permeability is moderate. The available water capacity is high. Runoff is slow, and the erosion hazard is slight. The seasonal high water table is within 1.0 to 2.5 feet of the surface in winter and early in spring. The surface layer is friable and easily tilled through a medium range of moisture content. It tends to crust and pack after hard rains.

Included in mapping are small areas of Arkabutla soils that occur in low areas on flood plains. Also included are Cascilla and Oaklimeter soils in higher areas near streams.

Most areas of the Chenneby soil are used as cropland and pasture except for a small acreage in woodland. It is well suited to row crops and small grains. Field ditches are needed and plant rows should be arranged to remove excess surface water. The return of crop residue to the soil improves soil fertility and tilth and reduces crusting and packing.

This soil is moderately suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes poor tilth and surface compaction. Proper stocking, controlled grazing, and weed and brush control improve tilth and reduce surface compaction.

This soil is well suited to loblolly pine, sweetgum, water oak, and yellow-poplar. It is moderately limited for managing the woodland and harvesting the tree crop by wetness and flooding. Logging during the drier periods helps to offset these limitations.

Chenneby soils are severely limited for urban uses by flooding and wetness. Flooding and wetness also severely limit use for septic tank absorption fields.

This soil is in capability subclass IIw and woodland suitability group 1w8.

12—Gillsburg silt loam, occasionally flooded. This is a somewhat poorly drained, nearly level soil that formed in silty alluvium on broad flood plains. This soil is subject to occasional flooding lasting from a few hours to about 2 or 3 days. Flooding occurs in winter or early in spring before crops are planted. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsoil extends to a depth of 60 inches or more. To a depth of about 15 inches, it is a brown silt loam mottled in shades of brown and gray. To a depth of 46 inches, it is light brownish gray silt loam mottled in shades of brown. Below this, it is mottled light gray and yellowish brown silt loam.

This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is high. Runoff is slow, and the erosion hazard is slight. The seasonal high water table is within 1.0 to 1.5 feet of the surface in winter and in spring.

Included in the mapping are small areas of Arkabutla, Kirkville, and Oaklimeter soils on flood plains. Also included are some small areas of poorly drained silty soils in depressions.

Most areas of this Gillsburg soil are used as cropland and pasture. A small acreage is in woodland. It is well suited to row crops and small grains. Seedbed preparation and cultivation are sometimes delayed by wetness of the soil. Field ditches are needed and plant rows should be arranged to remove excess surface water. Returning crop residue to the soil improves soil fertility and tilth and increases water infiltration.

This Gillsburg soil is moderately suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Good pasture management, such as proper stocking, controlled grazing, and weed and brush control, improves tilth and reduces surface compaction.

This soil is well suited to American sycamore, cherrybark oak, eastern cottonwood, green ash, loblolly pine, sweetgum, and water oak. Soil wetness and flooding are moderate limitations for managing the woodland and harvesting the tree crop. Logging during drier periods helps to offset these limitations.

This soil is severely limited for urban uses by soil wetness and the hazard of flooding. Soil wetness and flooding severely limit use for septic tank absorption fields.

This soil is in capability subclass IIw and woodland suitability group 2w8.

6B—Grenada silt loam, 1 to 3 percent slopes. This is a moderately well drained, very gently sloping soil that has a fragipan. It formed in silty material on broad upland ridgetops and stream terraces.

Typically, the surface layer is dark yellowish brown silt loam about 6 inches thick. The subsoil extends to a depth of 65 inches or more. To a depth of about 21 inches, it is yellowish brown silty clay loam and silt loam. To a depth of about 24 inches, it is very pale brown silt loam mottled in shades of brown. Below this, it is a firm, brittle and compact, dark yellowish brown silty clay loam or silt loam fragipan mottled in shades of gray and brown.

This soil ranges from very strongly acid to medium acid throughout, except where the surface layer has been limed. Permeability is moderate above the fragipan and slow in the fragipan. The available water capacity is medium. Runoff is medium to slow, and the erosion hazard is moderate to slight. In winter and early in spring, the fragipan supports a perched water table that rises to within 1.5 to 2.5 feet of the surface. The surface layer is friable and easily tilled through a fairly wide range of moisture content. It does, however, tend to crust and pack after hard rains. The fragipan restricts the rooting depth and also limits the amount of water available to plants.

Included in mapping are small areas of soils on uplands and terraces that are sandy below a depth of 30 to 48 inches. Also included are small areas of Calloway, Loring, and Providence soils.

Most areas of this Grenada soil are used as cropland and pasture. A small acreage is in woodland. This soil is well suited to row crops and small grains. Minimum tillage, grassed waterways, and contour farming help control erosion on cultivated fields. Returning crop residue to the soil improves soil fertility and tilth and reduces crusting.

This soil is moderately suited to grasses and legumes for hay pasture. This use of the soil effectively controls erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Proper stocking, controlled grazing, and weed and brush control help maintain good tilth and reduce surface compaction.

This soil is moderately suited to cherrybark oak, southern red oak, loblolly pine, shortleaf pine, sweetgum, water oak, and white oak. Woodland management limitations are slight.

This Grenada soil is moderately limited for urban uses by wetness and by slow permeability in the fragipan and, for streets and roads, by low strength. Special design and careful installation procedures help overcome these limitations. The slow permeability of the fragipan severely limits use for septic tank absorption fields. This limitation is partially overcome by enlarging the size of the absorption field.

This soil is in capability subclass IIe and woodland suitability group 3o7.

20—Grenada-Calloway association, frequently flooded. This association consists of moderately well drained and somewhat poorly drained, nearly level and very gently sloping soils that have a fragipan. The soils formed in silty material on broad ridges and terraces at low elevations bordering on the Enid and Sardis Reservoirs. These soils are flooded for periods of a few days to sometimes longer than a month each winter through early summer. The soils occur in a regular and repeating pattern on the landscape. Individual areas of each soil are large enough to map separately, but because of similar present and predicted use they were mapped as one unit. The mapped areas are irregular in width and length and range from 200 to 400 acres. Slopes range from 0 to 3 percent.

The moderately well drained Grenada soil is at the higher elevations and makes up about 45 percent of the map unit. Typically, the surface layer is yellowish brown silt loam about 6 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of about 25 inches, it is yellowish brown silty clay loam in the upper part and silt loam in the lower part. To a depth of about 29 inches, it is light gray silt loam mottled in shades of brown. Below this is a firm, brittle and compact, yellowish brown silty clay loam fragipan mottled in shades of gray and brown.

This Grenada soil ranges from very strongly acid to medium acid throughout, except where the surface layer has been limed. Permeability is moderate above the fragipan and slow in the fragipan. The available water capacity is medium. Runoff is medium to slow, and the erosion hazard is moderate to slight. In winter and spring, the fragipan supports a perched water table that rises to within 1.5 to 2.5 feet of the surface.

The somewhat poorly drained Calloway soil is on the broad flats and in depressional areas. It makes up about 20 percent of the map unit. Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil extends to a depth of about 60 inches. To a depth of about 19 inches, it is yellowish brown silt loam mottled in shades of brown and gray. To a depth of about 27 inches, it is light brownish gray silt loam mottled in shades of brown. Below this, it is a firm, brittle and compact, yellowish brown silty clay loam fragipan mottled in shades of gray and brown.

This Calloway soil ranges from very strongly acid to medium acid throughout. Permeability is moderate in the upper part of the subsoil and slow in the fragipan. The available water capacity is medium. Runoff is slow and the erosion hazard is slight. During periods of heavy rainfall, the fragipan supports a perched water table that rises to within 1.0 to 2.0 feet of the surface.

About 35 percent of the association consists of small areas of minor soils. These include Loring and Providence soils on the higher ridges and Arkabutla and Chenneby soils in low depressional areas on flood plains.

Most of the acreage is idle and covered with low-growing annual weeds and summer legumes. The soils are poorly suited to cultivated crops and pasture because of flooding. Soybeans are sometimes planted in the higher parts, however, after the floodwater has receded.

The association is poorly suited to woodland because of the duration of the flooding.

These soils are severely limited for urban uses by flooding. The slow permeability of the fragipan and flooding severely limit use for septic tank absorption fields.

These soils are in capability subclass IVw and are not assigned to a woodland suitability group.

11—Jena fine sandy loam, occasionally flooded. This is a well drained, nearly level soil that formed in loamy alluvium on broad flood plains. The soil is subject to occasional flooding lasting from a few hours to about 2 days. Flooding occurs in winter or early in spring before crops are planted. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown fine sandy loam about 7 inches thick. The subsoil, to a depth of about 38 inches, is yellowish brown fine sandy loam. The underlying material to a depth of 60 inches is yellowish brown sandy loam.

This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is medium, and the erosion hazard is slight. The seasonal high water table is more than 6 feet below the surface.

Included in the mapping are a few small areas of Cascilla, Kirkville, and Ochlockonee soils on flood plains. Also included are small areas of Oaklimeter soils in the lower parts of the flood plains.

Most areas of this Jena soil are used as cropland and pasture except for a small acreage in woodland. The soil is well suited to row crops and small grains. Occasional flooding may cause slight to moderate damage to crops. Returning crop residue to the soil improves soil fertility and tilth.

This soil is moderately suited to grasses and legumes for hay and pasture. Good management practices, such as proper stocking, controlled grazing, and weed and brush control, help maintain soil fertility and tilth.

This soil is well suited to loblolly pine, sweetgum, southern red oak, water oak, and white oak. Woodland management limitations are slight.

This soil is severely limited for urban uses by the flood hazard. Also, use for septic tank absorption fields is severely limited by the flood hazard.

The soil is in capability subclass IIw and woodland suitability group 1o7.

13—Kirkville fine sandy loam, occasionally flooded. This is a moderately well drained, nearly level soil that formed in loamy alluvium on broad flood plains. The soil is subject to occasional flooding lasting from a few hours to about 2 days. Flooding occurs in winter and early in spring before crops are planted. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark yellowish brown fine sandy loam about 9 inches thick. The subsoil extends to a depth of about 60 inches. To a depth of about 33 inches, it is light olive brown loam mottled in shades of brown and gray. Below this, it is light brownish gray loam mottled in shades of brown.

This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is slow, and the erosion hazard is slight. The seasonal high water table is within 1.5 to 2.5 feet of the surface in winter and spring.

Included in mapping are small areas of Jena, Gillsburg, and Ochlockonee soils on flood plains. Also included are a few areas of soils that have a surface layer of brown silt loam.

Most areas of this Kirkville soil are used as cropland and pasture except for a small acreage in woodland. The soil is well suited to row crops and small grains. Occasional flooding may cause slight to moderate damage to crops. Field ditches are needed and plant rows should be arranged to remove excess surface water. Returning crop residue to the soil maintains soil fertility and tilth.

This soil is well suited to grasses and legumes for hay and pasture. Proper stocking, controlled grazing, and weed and brush control help maintain soil fertility and tilth.

This soil is well suited to cherrybark oak, loblolly pine, sweetgum, and water oak. Flooding and soil wetness are moderate limitations to managing the woodland and harvesting the tree crop. These limitations can be partially overcome by logging during the drier seasons.

Kirkville soil is severely limited for urban use by wetness and flood hazard. Wetness and flooding severely limit use for septic tank absorption fields.

This soil is in capability subclass IIw and woodland suitability group 1w8.

3B—Lexington silt loam, 2 to 5 percent slopes, eroded. This is a well drained, gently sloping soil that formed in a mantle of silty material over loamy material on upland ridgetops.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil extends to a depth of about 72 inches. To a depth of about 24 inches, it is dark brown silty clay loam. To a depth of about 34 inches, it is strong brown silt loam. To a depth of about 56 inches, it is yellowish red loam. Below this, it is red sandy loam with yellowish red mottles.

In most areas, part of the original surface layer has been removed by erosion, and tillage has mixed the topsoil and material from the subsoil. In some places all of the plow layer is original topsoil, and in other places the plow layer is mainly material from the subsoil. Some areas have a few rills and shallow gullies.

This soil ranges from very strongly acid to medium acid throughout, except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately rapid in the lower part. The available water capacity is medium. Runoff is medium, and the erosion hazard is moderate. The seasonal high water table is more than 6 feet below the surface. The surface layer is friable and easily tilled through a relatively wide range of moisture content. The soil tends to crust and pack after hard rains.

Included in mapping are small areas of Loring, Providence, and Smithdale soils on uplands. Also included are areas of severely eroded soils that have a silty clay loam surface layer.

Most areas of this Lexington soil are used as cropland and pasture except for a small acreage in woodland. This Lexington soil is well suited to row crops (fig. 4) and small grains. The erosion hazard and runoff are increased by cultivation. Minimum tillage, terraces (fig. 5), contour farming, and grassed waterways control erosion and slow runoff. Returning crop residue to the soil improves soil fertility, increases infiltration, and reduces crusting and packing of the soil.

This soil is moderately suited to grasses and legumes for hay and pasture. Hay and pasture effectively control erosion. Overgrazing increases the erosion hazard, runoff, and surface compaction. Proper stocking, control of grazing, and weed and brush control help control erosion, slow runoff, and reduce surface compaction.

This soil is moderately suited to cherrybark oak, loblolly pine, shortleaf pine, southern red oak, sweetgum, and yellow-poplar. Woodland management limitations are slight.

This soil is slightly limited for urban uses. The limitations for septic tank absorption fields are slight.

This soil is in capability subclass IIe and woodland suitability group 3o7.

3C—Lexington silt loam, 5 to 8 percent slopes, eroded. This is a well drained, sloping soil that formed in a mantle of silty material underlain by loamy material on upland ridges and side slopes.

Typically, the surface layer is yellowish brown silt loam about 4 inches thick. The subsoil extends to a depth of about 72 inches. To a depth of about 42 inches, it is strong brown silt loam. To a depth of about 50 inches, it is yellowish red loam. Below this, it is red sandy loam.

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the topsoil and material from the subsoil. In some places all of the plow layer is the original topsoil, and in other places the plow layer is mainly material from the subsoil. Some areas have a few rills and shallow gullies.

This soil ranges from very strongly acid to medium acid throughout, except where the surface layer has been limed. Permeability is moderate in the upper part and moderately rapid in the lower part. The available water capacity is medium. Runoff is medium, and the erosion hazard is moderate. The seasonal high water table is more than 6 feet below the surface. The surface layer is friable and easily tilled over a relatively wide range of moisture content. The soil tends to crust and pack after hard rains.

Included in mapping are small areas of Loring soils on ridges on uplands. Also included are small areas of Smithdale soils and severely eroded soils.

Most areas of this Lexington soil are used as pasture and cropland, except for some small acreage in woodland. The soil is moderately suited to cultivated

Figure 4.—Soybeans growing on Lexington silt loam, 2 to 5 percent slopes, eroded.

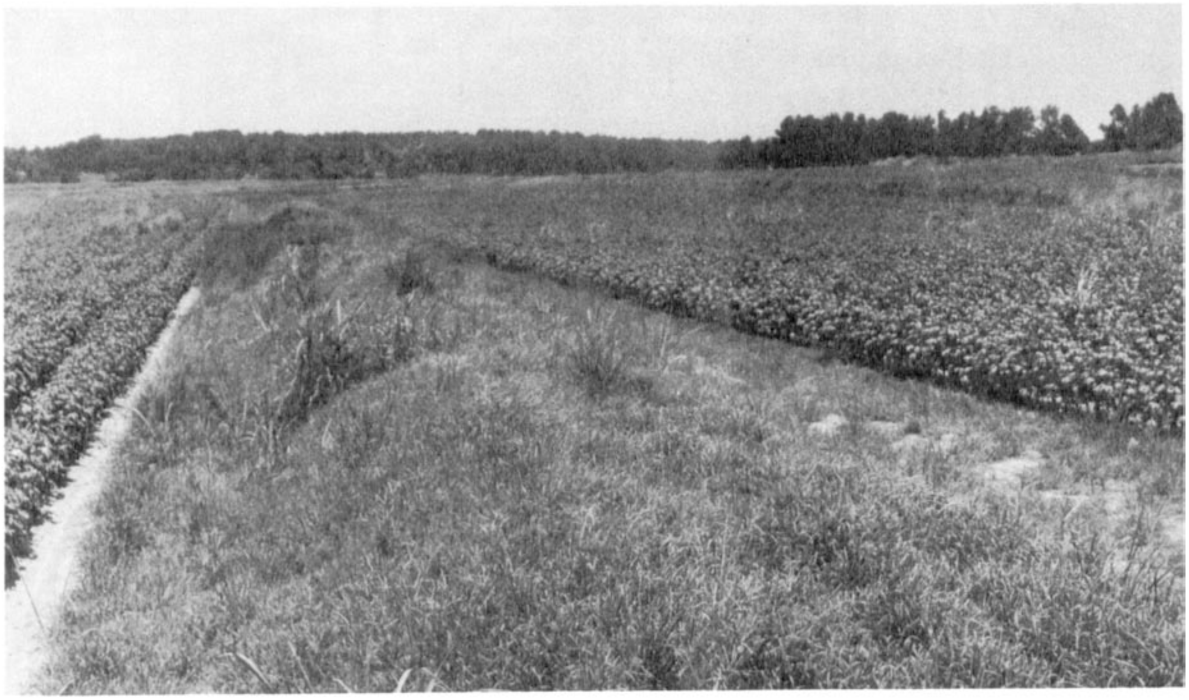


Figure 5.—Cotton growing on parallel terraces on Lexington silt loam, 2 to 5 percent slopes, eroded.

crops and small grains. The erosion hazard and runoff are increased by cultivation. Minimum tillage, terraces, grassed waterways, and cropping systems that include grasses and legumes slow runoff and help control erosion. Returning crop residue to the soil improves soil fertility and increases water infiltration.

This soil is moderately suited to grasses (fig. 6) and legumes for hay and pasture. Pasture and hay effectively control erosion. Overgrazing increases runoff and the erosion hazard. Proper stocking, controlled grazing, and weed and brush control help maintain soil fertility and control erosion.

This soil is moderately suited to cherrybark oak, loblolly pine, shortleaf pine, southern red oak, sweetgum, and yellow-poplar. Woodland management limitations are slight.

This soil is slightly limited for urban uses. Use for septic tank absorption fields is slightly limited.

This soil is in capability subclass IIIe and woodland suitability group 3o7.

3C3—Lexington silt loam, 5 to 8 percent slopes, severely eroded. This is a well drained, sloping soil that formed in a mantle of silty material over loamy material on upland ridges and side slopes.

Typically, the surface layer is dark brown silt loam about 2 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of about 30 inches, it is strong brown silty clay loam. To a depth of about 47 inches, it is strong brown sandy clay loam. Below this, it is yellowish red sandy loam.

In most areas the original surface layer has been lost through erosion and much of the surface layer consists entirely of subsoil material. There are patches in which the surface layer is a mixture of original topsoil and subsoil material. Rills and shallow gullies are common, and a few deep gullies that cannot be crossed by farm machinery have formed in places.

This soil ranges from very strongly acid to medium acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately rapid in the lower part. The available water capacity is medium. Runoff is medium to rapid, and the erosion hazard is severe. The seasonal high water table is more than 6 feet below the surface.

Included in the mapping are small areas of Loring and Smithdale soils on ridges and side slopes on uplands. Also included are a few small, slightly eroded areas.

This Lexington soil is dominantly used as pasture except for a small acreage in loblolly pine trees. It is poorly suited to row crops and small grains. If cultivated crops are grown, terraces, minimum tillage, grassed waterways, and cropping systems that include grasses and legumes help control runoff and erosion. Smoothing and shaping of gullies may be necessary to facilitate cultivation. Returning crop residue to the soil improves soil fertility and tilth and increases water infiltration.

This soil is moderately suited to grasses and legumes for hay and pasture. The use of the soil for pasture effectively controls erosion. Overgrazing causes excessive runoff and increases the erosion hazard. To facilitate mowing and other cultural practices, it is

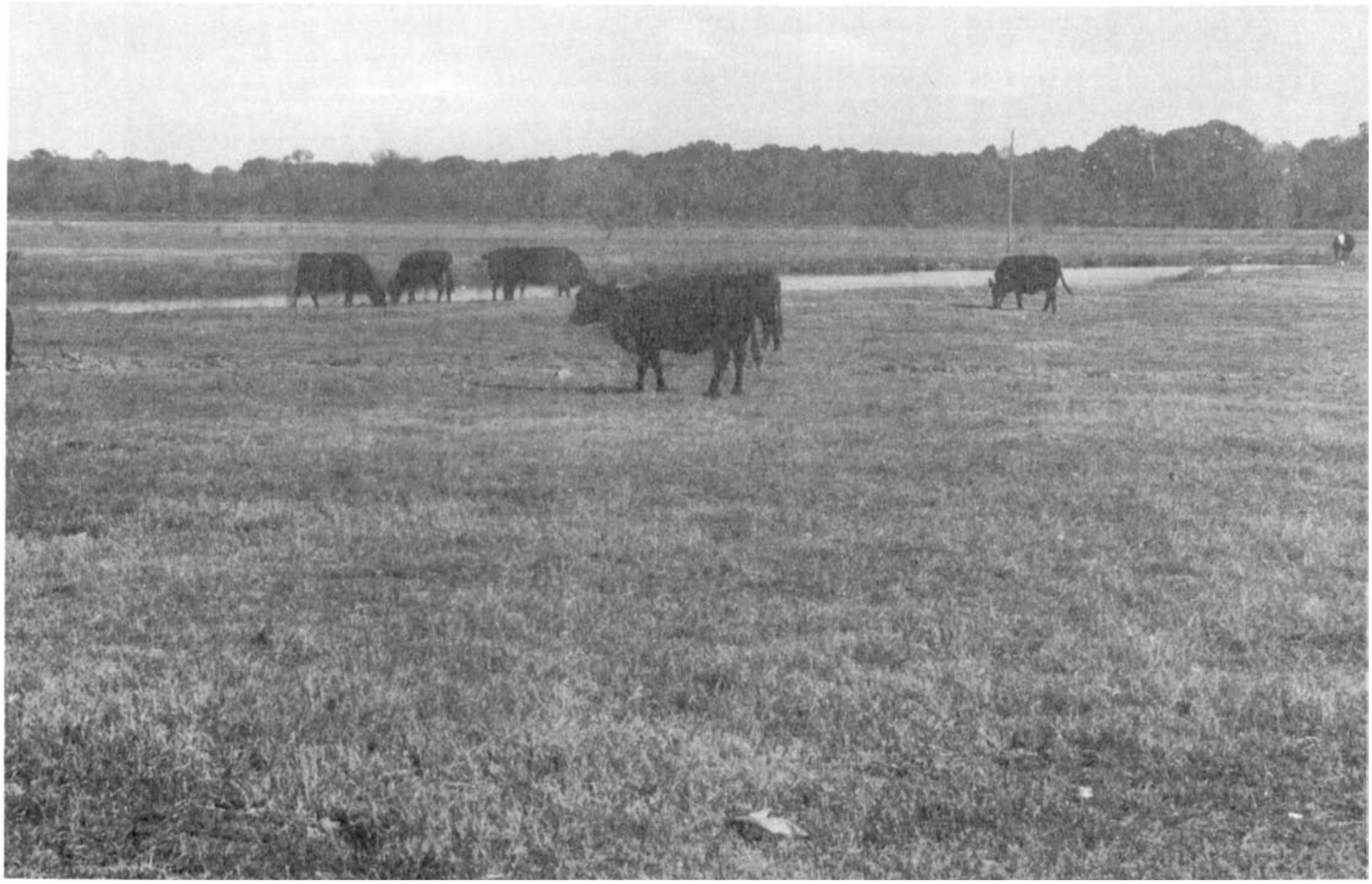


Figure 6.—Cattle grazing common bermudagrass on Lexington silt loam, 5 to 8 percent slopes, eroded.

sometimes desirable to smooth and shape gullies. Proper stocking, controlled grazing, and weed and brush control slow runoff and reduce erosion.

This soil is moderately suited to cherrybark oak, loblolly pine, shortleaf pine, southern red oak, sweetgum, and yellow-poplar. Woodland management limitations are slight.

This soil is slightly limited for urban uses. The limitations for septic tank absorption fields are slight.

This soil is in capability subclass IVe and woodland suitability group 3o7.

3D3—Lexington silt loam, 8 to 15 percent slopes, severely eroded. This is a well drained, strongly sloping or moderately steep soil that formed in a mantle of silty material over loamy material on uplands.

Typically, the surface layer is yellowish brown silt loam about 3 inches thick. The subsoil extends to a depth of about 60 inches. To a depth of about 23 inches, it is strong brown silty clay loam. To a depth of about 32 inches, it is reddish brown sandy clay loam. Below this, it is yellowish red sandy loam.

In most areas, the original surface layer has been lost through erosion, and much of the surface layer consists entirely of subsoil material. There are patches in which the surface layer is a mixture of original topsoil and subsoil material. Rills and shallow gullies are common, and a few deep gullies which cannot be crossed by farm machinery have formed in places.

This soil ranges from very strongly acid to medium acid throughout, except for the surface layer in limed areas. Permeability is moderate in the upper part of the subsoil and moderately rapid in the lower part. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe. The seasonal high water table is more than 6 feet below the surface.

Included in mapping are small areas of strongly sloping Loring and Smithdale soils on upland side slopes. Also included are a few small areas of soils that have 8 to 15 percent slopes and are slightly eroded.

Most areas of this Lexington soil are used as pasture (fig. 7). A small acreage is in woodland. This soil is poorly suited to row crops and small grains because of the severe erosion hazard, rapid runoff, and steepness of slope.

This soil is poorly suited to grasses and legumes for hay and pasture. Pasture effectively controls erosion. To facilitate mowing and other cultural practices, it is desirable to smooth and shape gullies. Overgrazing causes excessive runoff and increases the erosion hazard. Proper stocking, controlled grazing, and weed and brush control slow runoff and reduce the erosion hazard.

This soil is moderately suited to cherrybark oak, loblolly pine, shortleaf pine, southern red oak, sweetgum, and yellow-poplar. Woodland management limitations are slight.

This soil is moderately limited for urban uses mainly by steep slopes and, for streets and roads, by low strength. However, proper design and careful installation procedures offset these limitations. The use of this soil for septic tank absorption fields is moderately limited by slope, which can be overcome by good design and careful installation procedures.

This soil is in capability subclass VIe and woodland suitability group 3o7.

4B—Loring silt loam, 2 to 5 percent slopes, eroded. This is a moderately well drained, gently sloping soil that has a fragipan. It formed in silty material on broad upland ridgetops.

Typically, the surface layer is yellowish brown silt loam about 9 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of about 24 inches, it is strong brown silty clay loam and silt loam. Below this is a firm, brittle and compact, strong brown silt loam fragipan with gray and brown mottles.

In most areas, part of the original surface layer has been removed by erosion, and tillage has mixed the topsoil and material from the subsoil. There are patches where all of the plow layer is the original topsoil, and in other places the plow layer is mostly material from the orginal subsoil. Some areas have a few rills and shallow gullies.

This soil ranges from very strongly acid to medium acid throughout, except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is medium. Runoff is medium, and the erosion hazard is moderate. In winter and early in spring, the fragipan supports a perched water table

Figure 7.—Common bermudagrass pasture on Lexington silt loam, 8 to 15 percent slopes, severely eroded.

that rises to within 2.0 to 3.0 feet of the surface. The surface layer is friable and easily tilled through a relatively wide range of moisture content. It has a tendency to crust and pack after hard rains.

Included in mapping are small areas of Grenada soils on uplands and terraces. Also included are small areas of Lexington and Smithdale soils in upland ridges.

Most areas of this Loring soil are used as pasture and cropland, except for a small acreage in woodland. The soil is well suited to row crops and small grains. When row crops are grown, erosion control practices, such as minimum tillage, contour farming, terraces, and grassed waterways, help control erosion and slow runoff. Returning crop residue to the soil improves soil fertility and tilth and reduces soil crusting and packing.

This soil is moderately suited to grasses and legumes for hay and pasture. Hay and pasture effectively control erosion. Overgrazing or grazing when the soil is too wet causes surface compaction, excessive runoff, and poor tilth. Proper stocking, controlled grazing, and weed and brush control slow runoff, help maintain good tilth, and reduce compaction.

This soil is moderately suited to cherrybark oak, loblolly pine, southern red oak, sweetgum, and water oak. Woodland management limitations are slight.

This soil has moderate limitations for urban uses. The main limitations are wetness and, for streets and roads, low strength. Proper design and careful installation procedures offset these limitations. The slow permeability in the fragipan is a problem for septic tank absorption fields, but this can be partially overcome by increasing the size of the absorption field.

This soil is in capability subclass IIe; woodland suitability group 3o7.

Figure 8.—Profile of Loring silt loam, 5 to 8 percent slopes, eroded.

4C—Loring silt loam, 5 to 8 percent slopes, eroded. This is a moderately well drained, sloping soil that has a fragipan. It formed in silty material on upland ridges and side slopes.

Typically, the surface layer is yellowish brown silt loam about 5 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of about 30 inches, it is strong brown silty clay loam. Below this, it is a firm, brittle and compact, brown silt loam fragipan mottled in shades of gray and brown (fig. 8).

In most areas, part of the original surface layer has been removed by erosion, and tillage has mixed the topsoil and material from the subsoil. There are patches where all of the plow layer is the original topsoil, and in other places the plow layer is mainly material from the original subsoil. Some areas have a few rills and shallow gullies.

This soil ranges from very strongly acid to medium acid throughout, except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is medium. Runoff is medium, and the erosion hazard is moderate. In winter and early in spring, the fragipan supports a perched water table that rises to within 2.0 to 3.0 feet of the surface. The surface layer is friable and easily tilled over a relatively wide range of moisture content. It tends to crust and pack after hard rains.

Included in mapping are small areas of Lexington and Smithdale soils on uplands. Also included are a few small areas of soils that are severely eroded.

Most areas of this Loring soil are used as pasture and cropland, except for a small acreage in woodland. It is moderately suited to row crops and small grains. Cultivation increases the erosion hazard and runoff. If the soil is cultivated, minimum tillage, terraces, grassed waterways, and cropping systems that include grasses and legumes help to slow runoff and control erosion. Returning crop residue to the soil improves soil fertility and tilth and reduces soil crusting and packing.

This soil is moderately suited to grasses and legumes for hay and pasture. Hay and pasture effectively control erosion. Overgrazing increases the erosion hazard and runoff. Proper stocking, controlled grazing, and weed and brush control slow runoff and reduce erosion.

This soil is moderately suited to cherrybark oak, loblolly pine, southern red oak, sweetgum, and water oak. Woodland management limitations are slight.

This soil has moderate limitations for urban uses. The major limitations are wetness and, for streets and roads, low strength. Proper design and careful installation procedures help to offset these limitations. Low permeability in the fragipan is a problem for septic tank absorption fields but can be partially overcome by increasing the size of the absorption field.

This soil is in capability subclass IIIe and woodland suitability group 3o7.

50—Maben fine sandy loam, 12 to 25 percent slopes. This is a well drained, moderately steep or steep soil that formed in stratified shaly clay and loamy material on upland side slopes.

Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The subsoil extends to a depth of 34 inches. To a depth of about 26 inches, it is yellowish red clay or silty clay. Below this, it is reddish brown silty clay. The underlying material to a depth of 65 inches is stratified red clay loam or loam and grayish brown partially weathered shale.

This soil ranges from strongly acid to slightly acid in the surface layer and from strongly acid to medium acid in the subsoil. Permeability is moderately slow. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe. The seasonal high water table is more than 6 feet below the surface. The soil has high shrink-swell properties.

Included in the mapping are small areas of Lexington, Smithdale, Tippah, and Wilcox soils on uplands.

This Maben soil is mainly used as woodland and pasture. It is poorly suited to row crops and small grains mainly because of steep slopes, rapid runoff, and a severe erosion hazard.

This soil is poorly suited to most grasses and legumes for hay and pasture because of low productivity. Hay and pasture effectively control erosion. Overgrazing increases the erosion hazard and runoff. Proper stocking, controlled grazing, and weed and brush control slow runoff and help control erosion.

This soil is moderately suited to loblolly pine and shortleaf pine. It has moderate limitations for woodland use and management because of poor trafficability. These limitations can be partly offset by logging during the drier seasons.

This soil is severely limited for urban uses by steep slopes and high shrink-swell properties. The low permeability and steep slopes severely limit use for septic tank absorption fields.

This soil is in capability subclass VIIe and woodland suitability group 3c2.

38—Maben-Smithdale-Tippah association, hilly. This map unit consists of steep, well drained and moderately well drained soils that occur in regular and repeating patterns on rough uplands. The landscape is mainly hills with narrow winding ridgetops, steep side slopes, and narrow drainageways. The Maben soil formed in stratified shaly clay and loamy sediments on lower side slopes next to drainageways. The Smithdale soil formed in loamy material on the steep upper side slopes. The Tippah soil formed in a thin mantle of loess underlain by clay on ridgetops. Individual areas of each soil are large enough to map separately, but because of similar present and predicted use they were mapped as one unit. Mapped areas range from 200 to more than 1,000 acres. Slopes range from 8 to 35 percent.

The well drained Maben soil makes up about 40 percent of the map unit. Typically, the surface layer is yellowish brown fine sandy loam about 5 inches thick. The subsoil extends to a depth of about 40 inches. To a depth of about 20 inches, it is yellowish red clay. Below this, it is yellowish red silty clay with brownish mottles. The underlying material to a depth of 60 inches is stratified red, brown, and gray clay loam and partially weathered shale.

This Maben soil ranges from strongly acid to slightly acid in the surface layer and from strongly acid to medium acid in the subsoil. Permeability is moderately slow. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe. The seasonal high water table is more than 6 feet below the surface.

The well drained Smithdale soil makes up about 25 percent of the map unit. Typically, the surface layer is brown sandy loam about 12 inches thick. The subsoil extends to a depth of about 80 inches. To a depth of about 40 inches, it is yellowish red sandy clay loam. Below this, it is red sandy loam with a few pockets of uncoated sand grains.

This Smithdale soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe. The seasonal high water table is more than 6 feet below the surface.

The moderately well drained Tippah soil makes up about 25 percent of the map unit. Typically, the surface layer is yellowish brown silt loam about 3 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of about 12 inches, it is yellowish red silty clay loam in the upper part and strong brown silt loam in the lower part. Below this, it is silty clay mottled in shades of red, brown, and gray (fig. 9).

This Tippah soil ranges from very strongly acid to medium acid throughout. Permeability is slow. The available water capacity is high. Runoff is medium, and the erosion hazard is severe. A perched water table is within 2.0 to 2.5 feet of the surface during winter and early in spring.

Soils other than those named make up about 10 percent of the association. These include a few areas of

Figure 9.—Profile of Tippah soil in Maben-Smithdale-Tippah association, hilly.

Lexington and Providence soils on ridgetops, steep Lucy and Wilcox soils on steep uplands, and Cascilla, Ochlockonee, and Chenneby soils on narrow flood plains and drainageways.

Almost all of this association is used as woodland. The soils in this map unit are poorly suited to row crops and small grains because of the rough, steep slopes, the rapid runoff, and the erosion hazard. Maben and Smithdale soils are also poorly suited to grasses and legumes for hay and pasture. The sloping Tippah soil on ridges is moderately suited to pasture and hay.

These soils are moderately suited to cherrybark oak, loblolly pine, shortleaf pine, Shumard oak, southern red oak, sweetgum, and white oak. The wetness and clayey texture of Maben soils limit the use of equipment during wet periods. These limitations can be partially overcome by logging during the dry periods. The Smithdale and Tippah soils have slight limitations for woodland management.

These soils are severely limited for urban uses by steep slope, slow permeability, and high shrink-swell properties and, for streets and roads, by low strength. However, in some areas, proper design and careful installation procedures can overcome these limitations. Low permeability severely limits use of the Maben and Tippah soils for septic tank absorption fields. Slope of the Smithdale soils is a severe problem for this use.

The Maben soil is in capability subclass VIIe and woodland suitability group 3c2. The Smithdale soil is in capability subclass VIIe and woodland suitability group 3o1. The Tippah soil is in capability subclass IVe and woodland suitability group 3o7.

14—Oaklimeter silt loam, occasionally flooded. This is a moderately well drained, nearly level soil that formed in silty alluvium on broad flood plains. The soil is subject to occasional flooding lasting from a few hours to about 2 days. Flooding occurs in winter and early in spring before crops are planted. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark yellowish brown silt loam about 7 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of 50 inches, it is yellowish brown silt loam mottled in shades of brown and gray. Below this, it is mottled brown and gray silt loam.

This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is high. Runoff is slow, and the erosion hazard is slight. The seasonal high water table is within 1.5 to 2.5 feet of the surface in winter and in spring. Crusting and packing of the surface layer creates a slight problem for seedbed preparation and tillage.

Included in the mapping are small areas of well drained silty soils on flood plains and other soils with a sandy loam surface layer on natural levees. Also included in a few low areas are intermingled Gillsburg and Kirkville soils.

Most areas of this Oaklimeter soil are used as cropland and pasture, except for a small acreage in woodland. It is well suited to row crops and small grains. Field ditches are needed and plant rows should be arranged to remove excess surface water. The return of crop residue to the soil reduces soil crusting and packing and improves soil fertility and tilth.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes poor tilth and surface compaction. Proper stocking, controlled grazing, and weed and brush control help keep the soil in good tilth and reduce compaction.

This soil is well suited to cherrybark oak, eastern cottonwood, green ash, loblolly pine, Nuttall oak, water oak, sweetgum, and yellow-poplar. Woodland management limitations are slight.

This soil is severely limited for urban use by wetness and the flood hazard. The flood hazard and soil wetness severely limit use for septic tank absorption fields.

This soil is in capability subclass IIw and woodland suitability group 1o7.

9—Ochlockonee sandy loam, occasionally flooded. This is a well drained soil that formed in loamy alluvium. It is on broad, dominantly open, nearly level flood plains. It is subject to occasional flooding lasting from a few hours to about 2 days in winter and early in spring before crops are planted (fig. 10). Slopes range from 0 to 2 percent.

Typically, the surface layer is dark yellowish brown sandy loam about 6 inches thick. The underlying material to a depth of 60 inches is stratified layers of dark yellowish brown fine sandy loam, sandy loam, and silt loam mottled in shades of brown.

This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is slow, and the erosion hazard is slight. The seasonal high water table is within 3.0 to 4.0 feet of the surface during winter and spring. The soil has good tilth and can be cultivated throughout a wide range of moisture content.

Included in the mapping on flood plains are small areas of Bruno and Jena soils and other soils that have a silt loam surface layer. Also intermingled in a few low areas are well drained, stratified, silty soils and moderately well drained, stratified, sandy soils.

Most areas of this Ochlockonee soil are used as cropland and pasture (fig. 11) except for a small acreage of woodland. The Ochlockonee soil is well suited to row crops and small grains. Conservation practices needed to maintain soil fertility and good tilth are minimum tillage, proper row arrangement, surface field ditches, and return of crop residue to the soil.

Figure 10.—Rock installed to stabilize streambank on Ochlockonee sandy loam, occasionally flooded.

Figure 11.—Cattle grazing coastal bermudagrass on Ochlockonee sandy loam, occasionally flooded.

This soil is moderately suited to grasses and legumes for hay and pasture. There are no significant limitations for this use; however, proper stocking, controlled grazing, and weed and brush control help maintain soil fertility and production.

This soil is well suited to eastern cottonwood, loblolly pine, sweetgum, water oak, and yellow-poplar. Woodland management limitations are slight.

The soil is severely limited for urban uses by the flood hazard. This hazard is also a severe limitation for septic tank absorption fields.

This soil is in capability subclass IIw and woodland suitability group 1o7.

41—Ochlockonee-Bruno complex, frequently flooded. This map unit consists of small areas of well drained Ochlockonee soil, which formed in loamy alluvium, and excessively drained Bruno soil, which formed in sandy alluvium. Areas of these soils are so intermingled that they could not be shown separately at the scale selected for mapping. These soils are on broad, nearly level, dominantly open flood plains. They are flooded several times each year for periods ranging from a few hours to 6 or 7 days in winter and during the crop season. Individual mapped areas range from 15 to 120 acres. Slopes range from 0 to 2 percent.

The Ochlockonee soil makes up about 55 percent of the areas mapped. Typically, the surface layer is dark yellowish brown sandy loam about 6 inches thick. The underlying material to a depth of 60 inches is stratified dark yellowish brown fine sandy loam, sandy loam, and silt loam.

This Ochlockonee soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is slow, and the erosion hazard is slight. A seasonal high water table is within 3.0 to 4.0 feet of the surface during winter and spring.

The Bruno soil makes up about 30 percent of the areas mapped. Typically, the surface layer is yellowish brown loamy sand about 5 inches thick. The underlying material to a depth of 60 inches is pale brown sand and stratified dark yellowish brown sandy loam and loamy sand.

This Bruno soil ranges from strongly acid to mildly alkaline throughout. Permeability is rapid. The available water capacity is low. Runoff is slow, and the erosion hazard is slight. A seasonal high water table is within 4.0 to 6.0 feet of the surface in winter and spring.

Minor soils make up about 15 percent of the complex. These include small areas of Oaklimeter and Gillsburg soils, small areas of poorly drained sandy soils in low depressional areas, and small areas of moderately well drained loamy soils and stratified silty soils on flood plains.

Most areas of this map unit are used for pasture except for a small part that is in row crops and woodland. The soils in this map unit are poorly suited to row crops, small grains, and most pasture plants because of frequent flooding. With good management, however, summer grasses produce high yields.

The soils in this map unit are well suited to eastern cottonwood, water oak, sweetgum, and yellow-poplar. The Ochlockonee soil has only slight limitations for woodland management. Poor trafficability caused by the sandy surface of the Bruno soil is a moderate limitation to logging, but conventional equipment can be used.

These soils are severely limited for urban uses by seepage and flooding. The flood hazard is a severe limitation for septic tank absorption fields.

These soils are in capability subclass Vw. The Ochlockonee soil is in woodland suitability group 1w7, and the Bruno soil is in woodland suitability group 2s8.

40—Ochlockonee-Bruno association, frequently flooded. This map unit consists of well drained and excessively drained soils on broad, nearly level flood plains of major streams. The landscape is dominantly large wooded areas that flood two or three times each year in winter and during the crop season for periods of about 2 to 6 or 7 days. In many places the stream channels are clogged with sediment and debris, causing floodwater to spread over the area, drop new sediment, and in places cut new channels, thereby forming many small sloughs and low, wet depressions. Several small swamps have been created by seepage from springs along foot slopes in the uplands. The Ochlockonee and Bruno soils are in regular and repeating patterns on the landscape. The Ochlockonee soil formed in loamy alluvium and is in the lower positions farther from the stream channel. The Bruno soil formed in sandy alluvium and is in the higher positions adjacent to the stream channel. In most areas the soils could have been mapped separately, but because of present and predicted uses they were mapped as one unit. Most mapped areas contain both soils, but a few areas contain only one of the soils. Individual mapped areas range from 120 to about 400 acres. Slopes are 0 to 2 percent.

The well drained Ochlockonee soil makes up about 40 percent of the map unit. Typically, the surface layer is dark yellowish brown sandy loam about 6 inches thick. The underlying material to a depth of 60 inches is stratified dark yellowish brown fine sandy loam, sandy loam, and silt loam.

This Ochlockonee soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is slow, and the erosion hazard is slight. A seasonal high water table is within 3.0 to 4.0 feet of the surface during winter and spring.

The excessively drained Bruno soil makes up about 20 percent of the map unit. Typically, the surface layer is yellowish brown loamy sand about 5 inches thick. The underlying material to a depth of 60 inches is stratified dark yellowish brown loamy sand and pale brown sand.

This Bruno soil ranges from strongly acid to mildly alkaline. Permeability is rapid. The available water capacity is low. Runoff is slow, and the erosion hazard is slight. A seasonal high water table is within 4.0 to 6.0 feet of the surface during winter and spring.

Soils other than those named make up about 40 percent of the association. These include small intermingled areas of Gillsburg, Oaklimeter, Arkabutla, and Chenneby soils and poorly drained sandy soils in low, wet areas of the flood plain.

This map unit is dominantly wooded. The soils are poorly suited to row crops, small grains, and pasture. They are well suited to eastern cottonwood, water oak, willow oak, sweetgum, and yellow-poplar. The Ochlockonee soil has only slight limitations for woodland management. Poor trafficability caused by the sandy surface of the Bruno soil is a moderate limitation, but conventional equipment can be used.

The soils in this map unit are poorly suited to agriculture and urban uses because of frequent flooding. The use of these soils for septic tank absorption fields is severely limited by flooding.

These soils are in capability subclass Vw. The Ochlockonee soil is in woodland suitability group 1w7, and the Bruno soil is in woodland suitability group 2s8.

Pt—Pits. This unit consists of sand pits and borrow pits. These pits are open excavations from which sand and soil have been removed.

The sand pits are in the Meridian and Kosciusko geologic formations, which underlie a thin mantle of loess. Sand pits are areas from which only sand has been removed. They are mainly in the western half of the county in areas of Smithdale and Lucy soils. Borrow pits are areas from which soil and underlying material have been removed for use in construction of roads and dams.

The soil material exposed in these open pits supports low quality grass and trees. Most such plants are of little economic value except to control erosion. Many areas are left bare. These areas are poorly suited to crops, pasture, woodland, and urban uses.

Pits are not assigned to a capability subclass or woodland suitability group.

2B—Providence silt loam, 2 to 5 percent slopes, eroded. This is a moderately well drained, gently sloping soil that has a fragipan. It formed in a mantle of silty material underlain by loamy material on broad, upland ridgetops.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of about 23 inches, it is yellowish brown silt loam. Below this, it is a firm, brittle and compact, yellowish brown silt loam fragipan with gray and brown mottles.

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the topsoil and material from the subsoil. There are patches where all of the plow layer is the original topsoil, and in other places the plow layer is mainly material from the original subsoil. Some areas have a few rills and shallow gullies.

This soil ranges from very strongly acid to medium acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. Runoff is medium, and the erosion hazard is moderate. In winter and early in spring, the fragipan supports a perched water table that rises to within 1.5 to 3.0 feet of the surface. The surface layer is friable and easily tilled through a relatively wide range of moisture content. It does, however, tend to crust and pack after hard rains.

Included in mapping are small areas of Calloway and Grenada soils on uplands and terraces and Tippah soils on uplands. Also included are small areas of a soil with slopes of 5 to 8 percent.

Most areas of this Providence soil are used as cropland and pasture, except for the acreage in woodland. This soil is well suited to row crops and small grains. Erosion is a hazard if row crops are grown. Minimum tillage, contour farming, terraces, and grassed waterways slow runoff and help control erosion. Returning crop residue to the soil improves soil fertility and tilth and reduces soil crusting and packing.

This soil is moderately suited to grasses and legumes for hay and pasture. Overgrazing the pasture causes excessive runoff and increases the erosion hazard. Proper stocking, controlled grazing, and weed and brush control help control erosion and slow runoff.

This soil is moderately suited to loblolly pine, shortleaf pine, Shumard oak, and sweetgum. Woodland management limitations are slight.

This soil is moderately limited for urban uses by wetness and, for streets and roads, by low strength. Special design and careful installation procedures help overcome these limitations. The low permeability of the fragipan severely limits the use of this soil as a septic tank absorption field, but this can be partially overcome by increasing the size of the absorption field.

This soil is in capability subclass IIe and woodland suitability group 3o7.

2C—Providence silt loam, 5 to 8 percent slopes, eroded. This is a moderately well drained soil that has a fragipan. It formed in a mantle of silty material underlain by loamy material on sloping upland ridges and side slopes.

Typically, the surface layer is dark yellowish brown silt loam about 3 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of about 20 inches, it is strong brown silty clay loam. Below this, it is a firm, brittle and compact fragipan that is strong brown silt loam in the upper part and dark brown loam in the lower part and is mottled in shades of gray and brown throughout.

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the topsoil and material from the subsoil. There are patches where all of the plow layer is the original topsoil, and in other places the plow layer is mainly material from the subsoil. Some areas have a few rills and shallow gullies.

This soil ranges from very strongly acid to medium acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. Runoff is medium, and the erosion hazard is moderate. A perched water table is within 1.5 to 3.0 feet of the surface and above the fragipan in winter and early in spring. Although the soil can be tilled through a relatively wide range of moisture content, it tends to crust and pack after hard rains.

Included in the mapping are small areas of Calloway and Grenada soils on uplands and terraces and Tippah soils on uplands. Also included are a few small areas that are severely eroded and a few small areas where slopes range from 2 to 5 percent.

Most areas of this Providence soil are used as pasture and cropland. A few areas are in woodland. This soil is moderately suited to row crops and small grains. The erosion hazard and runoff increase if row crops are grown. Minimum tillage, contour farming, terraces, grassed waterways, and cropping systems that include grasses and legumes help slow runoff and control erosion. Returning crop residue to the soil improves soil fertility and tilth and reduces soil crusting and packing.

The soil is moderately suited to grasses and legumes for hay and pasture. Overgrazing increases the erosion hazard and runoff. Proper stocking, controlled grazing, and weed and brush control help control erosion and slow runoff.

This soil is moderately suited to loblolly pine, shortleaf pine, Shumard oak, and sweetgum. Woodland management limitations are slight.

This soil is moderately limited for urban uses. Low strength is the main limitation for streets and roads. This can be overcome by special design and careful installation. The low permeability of the fragipan severely limits use of this soil for septic tank absorption fields, but this can be partially overcome by increasing the size of the absorption field.

This soil is in capability subclass IIIe and woodland suitability group 3o7.

2C3—Providence silt loam, 5 to 8 percent slopes, severely eroded. This is a moderately well drained, sloping soil that has a fragipan. It formed in a mantle of silty material underlain by loamy material on upland ridges and side slopes.

Typically, the surface layer is dark yellowish brown silt loam about 3 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of about 22 inches, it is strong brown silty clay loam in the upper part and dark brown silt loam in the lower part. Below this, it is a firm, brittle and compact fragipan that is dark brown silt loam in the upper part and dark brown fine sandy loam in the lower part mottled in shades of gray and brown.

In most areas, the original surface layer has been lost through erosion and much of the surface layer consists entirely of subsoil material. There are patches in which the surface layer is a mixture of original topsoil and subsoil material. Rills and shallow gullies are common, and a few deep gullies which cannot be crossed by farm equipment have formed in places.

This soil ranges from very strongly acid to medium acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. Runoff is medium to rapid, and the erosion hazard is severe. In winter and early in spring, the fragipan supports a perched water table that rises to within 1.5 to 3.0 feet of the surface. The soil can be tilled through a medium range of moisture content. It tends to crust and pack after hard rains.

Included in the mapping are small areas where the surface layer is silty clay loam and a few spots on high knolls where the fragipan is exposed. Also included are small areas of Calloway and Grenada soils on uplands and terraces and Tippah soils on uplands.

Most areas of this Providence soil are used as pasture, except for a small acreage in cropland and woodland. It is poorly suited to row crops and small grains. Erosion is a severe hazard. If row crops are grown, minimum tillage, contour farming, terraces, grassed waterways, and cropping systems that include grasses and legumes help slow runoff and control erosion.

This soil is moderately suited to grasses and legumes for hay and pasture. Overgrazing increases the erosion hazard and runoff. Proper stocking, controlled grazing, and weed and brush control help control erosion and slow runoff. To facilitate mowing and other cultural practices, it is sometimes desirable to smooth and shape gullies.

This soil is moderately suited to loblolly pine, shortleaf pine, Shumard oak, and sweetgum. The woodland management limitations are slight.

This soil is moderately limited for urban uses. Low strength is the main limitation for streets and roads. Special design and careful installation procedures help to overcome this limitation. The low permeability of the fragipan severely limits the use of this soil for septic tank absorption fields, but this can be partially overcome by increasing the size of the absorption field.

This soil is in capability subclass IVe and woodland suitability group 3o7.

2D3—Providence silt loam, 8 to 12 percent slopes, severely eroded. This is a moderately well drained, strongly sloping soil that has a fragipan. It formed in a mantle of silty material over loamy material on upland side slopes.

Typically, the surface layer is dark yellowish brown silt loam about 2 inches thick. The subsoil extends to a depth of about 60 inches. To a depth of about 24 inches, it is yellowish red silty clay loam in the upper part and silt loam in the lower part. Below this, it is a firm, brittle and compact fragipan that is strong brown silt loam in the upper part and yellowish red loam in the lower part and is mottled in shades of gray.

In most areas, the original surface layer has been lost through erosion and much of the surface layer consists entirely of subsoil material. There are patches in which the surface layer is a mixture of original topsoil and subsoil material. Rills and shallow gullies are common, and a few deep gullies which cannot be crossed by farm equipment have formed in places.

This soil ranges from very strongly acid to medium acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe. The seasonal high water table is perched within 1.5 to 3.0 feet of the surface and above the fragipan in winter and in spring.

Included in the mapping are small areas of Lexington, Maben, Smithdale, and Tippah soils on uplands. Also included are small areas of soils with 5 to 8 percent slopes that are not severely eroded.

Most areas of this Providence soil are used as pasture except for a small acreage in woodland. It is poorly suited to row crops and small grains because of the severe erosion hazard, rapid runoff, and steep slopes.

This soil is moderately suited to grasses and legumes for hay and pasture. The use of this soil for pasture effectively controls erosion. To facilitate mowing and other cultural practices, it may be desirable to smooth and shape gullies. Overgrazing causes excessive runoff and increases the erosion hazard. Proper stocking, controlled grazing, and weed and brush control help slow runoff and reduce the erosion hazard.

This soil is moderately suited to loblolly pine, shortleaf pine, Shumard oak, and sweetgum. Woodland management limitations are slight.

This soil is moderately limited for urban uses. Slope and low strength for streets and roads are the main limitations. Special design and careful installation procedures help offset these limitations. The low permeability of the fragipan and slope severely limit use of this soil for septic tank absorption fields, but this limitation can be partially overcome by increasing the size of the absorption field and constructing it on the contour.

This soil is in capability subclass VIe and woodland suitability group 3o7.

7F—Smithdale sandy loam, 15 to 35 percent slopes, eroded. This is a well drained, moderately steep or steep soil that formed in loamy material on upland side slopes (fig. 12).

Typically, the surface layer is dark brown sandy loam about 5 inches thick. The upper part of the subsoil is red sandy clay loam about 17 inches thick. The lower part to a depth of 80 inches is red sandy loam with few pockets of uncoated sand grains.

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the topsoil and material from the subsoil. There are patches where all of the plow layer is the original topsoil, and in other places the plow layer is mainly subsoil material. Some areas have a few rills and shallow gullies and a few deep gullies which cannot be crossed by farm equipment.

This soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe. The seasonal high water table is more than 6 feet below the surface.

Included in mapping are small areas of Lexington, Lucy and Maben soils on uplands.

Most areas of this Smithdale soil are used as woodland and pasture. It is poorly suited to row crops, hay, and pasture because of the steep slopes, rapid runoff, and erosion hazard. The soil is best suited to woodland or permanent grasses and legumes.

This soil is moderately suited to loblolly pine and shortleaf pine. Woodland management limitations are slight.

This soil is severely limited for urban uses by steep slopes. Steep slopes also severely limit use for septic tank absorption fields.

This soil is in capability subclass VIIe; woodland suitability group 3o1.

Figure 12.—Common bermudagrass pasture on Smithdale sandy loam, 15 to 35 percent slopes, eroded.

7—Smithdale-Udorthents complex, gullied. This map unit consists of small areas of Smithdale soils and Udorthents that are so intermingled that they could not be shown separately at the scale selected for mapping. The well drained, moderately steep or steep Smithdale soil is on upland side slopes and narrow ridges between deep, wide, irregularly shaped gullies. It formed in loamy material. The Udorthents are very severely eroded soils that formed in the loamy material in gullied areas. The gullies form an intricate dendritic pattern. The gullies range from 3 to 30 feet deep. The bottoms of the gullies range from nearly level to V-shaped, and many of the sides are nearly vertical. Individual mapped areas are irregular in shape and range from 15 to 160 acres. Slopes range from 8 to 35 percent.

The Smithdale soil makes up about 50 percent of each mapped area. Typically, the surface layer is dark yellowish brown sandy loam about 5 inches thick. The upper part of the subsoil, to a depth of about 25 inches, is yellowish red sandy clay loam. The lower part of the subsoil to a depth of 65 inches is red sandy loam with a few pockets of uncoated sand grains.

This Smithdale soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe. The seasonal high water table is more than 6 feet below the surface.

The Udorthents make up about 35 percent of mapped areas. In a representative area the soils are so severely eroded by water that horizons are destroyed beyond recognition or identification. Texture is variable, but is dominantly loamy with a large amount of sand. The gully bottoms and gully walls are a part of the Udorthents. The soil material of the gully floors is stratified and varies widely in thickness, texture, and arrangement within short distances.

Udorthents are very strongly acid or strongly acid. Permeability is variable. The available water capacity is low. Runoff is very rapid, and the erosion hazard is very severe (fig. 13). The seasonal high water table is more than 6 feet below the surface.

Figure 13.—Brush dams constructed to control erosion on Smithdale-Udorthents complex, gullied.

Small areas of steep Lucy soils on side slopes and Lexington, Loring, and Providence soils on narrow ridgetops make up about 15 percent of the complex.

Most of the acreage is in woodland and pasture. These areas were formerly cultivated, but because of severe sheet and gully erosion, crops are no longer grown. The Smithdale soil and Udorthents are poorly suited to row crops and pasture. Because of the steep slopes and the very severe erosion hazard, this complex is better suited to woodland than to other uses.

The Smithdale soil is moderately suited to loblolly pine and shortleaf pine. Udorthents are poorly suited to loblolly pine. Although seedling mortality is severe, established trees grow at a moderate rate. The presence of steep gully walls and somewhat inaccessible ridges between the gullies severely limit woodland use and management. These limitations can be partially overcome by locating haul roads near rims of gullies and by logging up the hill using long-lead cable hitches and stick loaders, or by logging in a similar manner from the gully floor.

The complex is severely limited for urban uses, mainly by steep slopes and deep, wide gullies. The use of this complex for septic tank absorption fields is severely restricted by steep, rough slopes.

This complex is in capability subclass VIIe. The Smithdale soil is in woodland suitability group 3o1, and the Udorthents are not assigned to a woodland suitability group.

70—Smithdale-Lucy association, hilly. This map unit consists of well drained, steep soils that formed in loamy material on rough uplands. The landscape is steep hills with narrow winding ridgetops, steep side slopes, and narrow drainageways. These soils occur in regular and repeating patterns. The Smithdale soil is on the narrow ridgetops and steep upper parts of side slopes. The Lucy soil is on the lower part of the steep side slopes. Individual areas of each soil are large enough to map separately, but because of similar present and expected uses they were mapped as one unit. Mapped areas are dominantly large and wooded and range from 160 acres to several thousand acres. Slopes range from 17 to 40 percent.

The well drained Smithdale soil makes up about 50 percent of the map unit. Typically, the surface layer is yellowish brown sandy loam about 9 inches thick. The upper part of the subsoil, to a depth of about 26 inches, is red sandy clay loam. The lower part of the subsoil to a depth of 72 inches is yellowish red sandy loam with a few pockets of uncoated sand grains.

This Smithdale soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is rapid, and the erosion hazard is severe. The seasonal high water table is more than 6 feet below the surface.

The well drained Lucy soil makes up about 30 percent of the map unit. Typically, the surface layer is dark grayish brown loamy sand about 4 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of about 28 inches. The subsoil extends to a depth of about 65 inches. To a depth of about 40 inches, it is yellowish red sandy loam. Below this, it is red sandy clay loam and yellowish red sandy loam.

This Lucy soil is very strongly acid or strongly acid throughout. Permeability is moderately rapid in the upper part and moderate in the lower part. The available water capacity is medium. Runoff is medium, and the erosion hazard is slight. The seasonal high water table is more than 6 feet below the surface.

About 20 percent of the association consist of small areas of minor soils. These include Maben soil in the lower parts of side slopes, Lexington and Providence soils on narrow ridgetops, and Ochlockonee and Arkabutla soils in narrow drainageways.

Most areas of the association are used as woodland. These soils are poorly suited to pasture or row crops because of steep slopes, rapid runoff, and the erosion hazard.

The soils are moderately suited to loblolly pine, shortleaf pine, and southern red oak. The Smithdale soil has slight limitations for woodland management. Poor trafficability caused by the sandy surface of the Lucy soil is a moderate limitation, but conventional equipment can be used.

This association is severely limited for urban uses by steep slopes. In some small areas where the soils are gently sloping to sloping, limitations are slight for urban uses. Steep slopes are severe limitations for use of these soils for septic tank absorption fields.

The Smithdale soil is in capability subclass VIIe and woodland suitability group 3o1. The Lucy soil is in capability subclass VIIs and woodland suitability group 3s2.

71—Smithdale-Udorthents association, gullied. This map unit consists of areas of well drained Smithdale soil, Udorthents, and gullied land that occur in a regular and repeating pattern. The landscape is mainly steep, rough hills with narrow ridgetops and incised drainageways and large areas of deep, wide-branching gullies. The steep Smithdale soil formed in loamy material on the narrow ridgetops and side slopes. Udorthents are steep and very severely eroded. They formed in loamy material in gullied areas on upland side slopes. The gullies form an intricate dendritic pattern. They are 3 to 30 feet deep. The bottoms of the gullies range from nearly level to V-shaped, and many of the sides are nearly vertical. Individual areas of each soil are large enough to map separately, but because of similar present and predicted use, they were mapped as one unit. Individual areas range from 160 acres to several hundred acres. Slopes range from 17 to 35 percent.

The well drained Smithdale soil makes up about 40 percent of the map unit. Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of about 14 inches. The subsoil extends to a depth of about 70 inches. To a depth of about 38 inches, it is yellowish red sandy clay loam. Below this, it is yellowish red sandy loam with a few pockets of uncoated sand grains.

This Smithdale soil is very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate. The available water capacity is medium. Runoff is rapid and the erosion hazard is severe. The seasonal high water table is more than 6 feet below the surface.

Udorthents make up about 35 percent of this map unit. In a representative area they have been so severely eroded by water that the surface layer and varying amounts of the subsoil have been washed away. In many places, gullies are cut into the substratum. Texture is variable, but is dominantly loamy with a large amount of sand. The gully bottoms and gully walls are part of the Udorthents. The soil material of the gully floors is stratified and varies widely in thickness, texture, and arrangement within short distances.

Udorthents are very strongly acid or strongly acid throughout. Permeability is variable. The available water capacity is low. Runoff is very rapid, and the erosion hazard is very severe. The seasonal high water table is more than 6 feet below the surface.

About 25 percent of the association consists of small areas of minor soils. They include steep Lucy soils on side slopes between gullied areas and Lexington, Loring, and Providence soils on ridgetops.

Most areas of the association are used as woodland. Much of this land was formerly cultivated but, because of severe sheet and gully erosion, crops are no longer grown. Because of the steep slopes, the erosion hazard, and the roughness of the landscape these soils are poorly suited to row crops and pasture. They are better suited to loblolly pine than to any other use (fig. 14).

Figure 14.—Loblolly pine trees planted in gullies to control erosion on Smithdale-Udorthents association, gullied.

The Smithdale soils are moderately suited to loblolly pine, and Udorthents are poorly suited. Although seedling mortality is severe in Udorthents, established loblolly pine trees grow at a moderate rate. The steep gully walls and somewhat inaccessible ridges between the gullies severely limit woodland use and management. These limitations can be partially overcome by locating haul roads near rims of gullies and logging up the hill using long-lead cable hitches and stick loaders, or logging in a similar manner from the gully floor.

These soils are severely limited for urban uses by the deep, wide, irregularly shaped gullies and steep slopes. Steep, rough slopes severely limit the use of these soils for septic tank absorption fields.

These soils are in capability subclass VIIe. The Smithdale soil is in woodland suitability group 3o1, and the Udorthents are not assigned to a woodland suitability group.

5B—Tippah silt loam, 2 to 5 percent slopes, eroded. This is a moderately well drained, gently sloping soil that formed in a mantle of silty material underlain by clay on upland ridgetops.

Typically, the surface layer is yellowish brown silt loam about 4 inches thick. The subsoil extends to a depth of about 60 inches. To a depth of about 21 inches, it is yellowish red silty clay loam. To a depth of about 30 inches, it is silty clay loam mottled in shades of brown, red, and gray. Below this, it is silty clay mottled in shades of gray, brown, and red.

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the topsoil and material from the subsoil. There are patches where all of the plow layer is the original topsoil, and in other places the plow layer is mainly material from the subsoil. Some areas have a few rills and shallow gullies.

This soil ranges from very strongly acid to medium acid throughout. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is medium, and the erosion hazard is severe. The seasonal high water table is perched within 2.0 to 2.5 feet of the surface in winter and in spring. The surface layer is friable and is easily tilled through a fairly wide range of moisture content. It tends to crust and pack after hard rains.

Included in mapping are small areas of Maben and Providence soils on uplands. Also included are a few small areas where slopes are as much as 7 percent.

Most areas of this Tippah soil are used as cropland and pasture. A small acreage is in woodland. This soil is well suited to row crops and small grains. When row crops are grown, minimum tillage, contour farming, grassed waterways, and terraces may be needed to control erosion. Returning crop residue to the soil improves fertility and tilth and reduces crusting and packing.

This soil is well suited to grasses and legumes for hay and pasture. Hay and pasture effectively control erosion. Overgrazing or grazing when the soil is too wet causes surface compaction, excessive runoff, and poor tilth. Proper stocking, controlled grazing, and weed and brush control help slow runoff, maintain good tilth, and reduce compaction.

This soil is moderately suited to cherrybark oak, loblolly pine, Shumard oak, sweetgum, white oak, and yellow-poplar. Woodland management limitations are slight.

The soil is severely limited for urban uses by wetness and high shrink-swell properties and, for streets and roads, by low strength. Proper design and careful installation procedures help offset these limitations. Slow permeability of the clay lower part of the subsoil severely limits the use of this soil for septic tank absorption fields, but this can be partially overcome by increasing the field size.

This soil is in capability subclass IIe and woodland suitability group 3o7.

5C—Tippah silt loam, 5 to 8 percent slopes, eroded. This is a moderately well drained, sloping soil that formed in a mantle of silty material underlain by clay on upland ridgetops and side slopes.

Typically, the surface layer is dark yellowish brown silt loam about 5 inches thick. The subsoil extends to a depth of about 65 inches. To a depth of about 17 inches, it is strong brown silty clay loam. To a depth of about 36 inches, it is strong brown silty clay loam mottled in shades of brown and gray. Below this, it is yellowish red silty clay and grayish brown clay mottled in shades of brown, red, and gray.

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the topsoil and material from the subsoil. There are patches where all of the plow layer is the original topsoil, and in other places the plow layer is mainly material from the subsoil. Some areas have few rills and shallow gullies.

This soil ranges from very strongly acid to medium acid throughout. Permeability is moderate in the upper part of the subsoil and slow in the lower part. Runoff is medium, and the erosion hazard is severe. The seasonal high water table is perched within 2.0 to 2.5 feet of the surface. The soil can be tilled through a fairly wide range of moisture content, but it tends to crust and pack after hard rains.

Included in mapping are small areas of Maben, Providence, and Wilcox soils on uplands. Also included are a few small areas of severely eroded Tippah soils.

Most areas of this Tippah soil are used as pasture and woodland. A small acreage is used as cropland. This soil is moderately suited to row crops and small grains. Cultivation increases runoff and the erosion hazard. If row crops are grown, adequate cropping systems, minimum tillage, contour farming, grassed waterways, and terraces help control erosion. The return of crop residue to the soil improves fertility and tilth and reduces crusting and packing.

This soil is well suited to grasses and legumes for hay and pasture. Pasture effectively controls erosion. Overgrazing or grazing when the soil is too wet causes surface compaction, excessive runoff, and poor tilth. Proper stocking, controlled grazing, and weed and brush control slow runoff, help maintain tilth, and reduce compaction.

This soil is moderately suited to cherrybark oak, loblolly pine, Shumard oak, sweetgum, white oak, and yellow-poplar. Woodland management limitations are slight.

This Tippah soil is severely limited for urban uses by high shrink-swell properties and, for streets and roads, by low strength. Proper design and careful installation procedures help offset these limitations. The slow permeability of the clay lower part of the subsoil severely limits use of the soil for septic tank absorption fields, but this can be partially overcome by increasing the field size.

This soil is in capability subclass IIIe and woodland suitability group 3o7.

5D—Tippah silt loam, 8 to 12 percent slopes, eroded. This is a moderately well drained, strongly sloping soil that formed in a mantle of silty material underlain by clay on upland side slopes.

Typically, the surface layer is yellowish brown silt loam about 3 inches thick. The subsoil extends to a depth of about 60 inches. To a depth of about 18 inches, it is strong brown silty clay loam. To a depth of about 24 inches, it is strong brown silty clay loam with light brownish gray mottles. Below this, it is yellowish brown silty clay and mottled brown, gray, and red silty clay.

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the topsoil and material from the subsoil. There are patches where all of the plow layer is the original topsoil, and in other places the plow layer is mainly material from the subsoil. Some areas have a few rills and shallow gullies.

This soil ranges from very strongly acid to medium acid throughout. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is medium to rapid, and the erosion hazard is severe. The seasonal high water table is perched within 2.0 to 2.5 feet of the surface during winter and early in spring.

Included in mapping are small areas of Maben, Providence, and Wilcox soils on uplands. Also included are a few small areas of severely eroded soils.

Most areas of this Tippah soil are used as pasture and woodland. It is poorly suited to row crops and small grains. Because of the erosion hazard, this soil is better suited to permanent plant cover. If row crops are grown, rotation with grasses and legumes, contour stripcropping, contour farming, minimum tillage, terraces, and grassed waterways are recommended.

This soil is moderately suited to grasses and legumes for hay and pasture, which effectively control erosion. Overgrazing increases runoff and the erosion hazard. Proper stocking, controlled grazing, and weed and brush control help slow runoff and control erosion.

This soil is moderately suited to cherrybark oak, loblolly pine, Shumard oak, sweetgum, white oak, and yellow-poplar. Woodland management limitations are slight.

This soil is severely limited for urban uses. The main limitations are wetness, slope, and high shrink-swell properties and, for streets and roads, low strength. Proper design and careful installation procedures partially overcome these limitations. Slope and the slow permeability of the lower part of the subsoil severely limit use of this soil for septic tank absorption fields, but these limitations can be partially overcome by increasing the size of the field and constructing it on the contour.

This soil is in capability subclass IVe and woodland suitability group 3o7.

8E—Wilcox silt loam, 12 to 25 percent slopes, eroded. This is a somewhat poorly drained, strongly sloping to steep soil that formed in clayey shale on upland side slopes.

Typically, the surface layer is yellowish brown silt loam 5 inches thick. The subsoil extends to a depth of about 54 inches. To a depth of about 20 inches, it is reddish brown and yellowish red clay with gray and red mottles. To a depth of about 36 inches, it is clay mottled in shades of red, brown, and gray. Below this, it is gray clay with yellowish brown mottles. The underlying material to a depth of 65 inches is soft weathered shale with yellowish brown stains.

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the topsoil and material from the subsoil. There are patches where all of the plow layer is the original topsoil, and in other places the plow layer is mainly material from the subsoil. Some areas have a few rills and shallow gullies. A few deep gullies are along drainageways and cattle trails.

This soil ranges from extremely acid to strongly acid throughout. Permeability is slow. The available water capacity is high. Runoff is rapid, and the erosion hazard is severe. A seasonal high water table is perched within 1.5 to 3.0 feet of the surface in winter and early in spring.

Included in mapping are small areas of Maben, Tippah, and Providence soils on uplands. Also included are small areas of other soils in which the surface layer has been thinned by erosion and mixed with the subsoil.

This Wilcox soil is used mostly as woodland. It is poorly suited to row crops, small grains, and pasture plants because of steep slopes, rapid runoff, and the severe erosion hazard. It is best suited to permanent plants.

This soil is moderately suited to loblolly pine and shortleaf pine. It is moderately limited for woodland management and harvesting of the tree crop by poor trafficability in wet weather, because it is shallow to clay. Logging during drier periods offsets this limitation.

This soil is severely limited for urban uses by slow permeability and high shrink-swell properties and, for streets and roads, by low strength. The very slow permeability of the clay subsoil and steep slopes severely limit the use of this soil for septic tank absorption fields, but this limitation can be partially overcome by increasing the size of the field.

This soil is in capability subclass VIIe and woodland suitability group 3c2.

44—Wilcox-Tippah association, hilly. This map unit consists of somewhat poorly drained and moderately well drained soils in a regular and repeating pattern. The landscape is hills with narrow winding ridgetops, steep side slopes, and narrow drainageways. The steep Wilcox soil formed in clayey shale on side slopes. The sloping and strongly sloping Tippah soil formed in a thin mantle of silty material over clay on ridgetops and side slopes. Individual areas of each soil are large enough to map separately, but because of similar present and predicted uses they were mapped as one unit. Mapped areas range from 200 to several hundred acres. Slopes range from 8 to 25 percent.

The somewhat poorly drained Wilcox soil makes up about 50 percent of the map unit. Typically, the surface layer is yellowish brown silt loam about 4 inches thick. The subsoil extends to a depth of about 40 inches. To a depth of about 34 inches, it is yellowish red clay with light brownish gray mottles. Below this, it is clay mottled in shades of red, brown, and gray. The underlying material to a depth of 60 inches is soft weathered shale mottled in shades of gray and brown.

This Wilcox soil ranges from extremely acid to strongly acid throughout. Permeability is slow. The available water capacity is high. Runoff is rapid, and the erosion hazard is severe. A seasonal high water table is perched within 1.5 to 3.0 feet of the surface in winter and early in spring.

The moderately well drained Tippah soil makes up about 30 percent of the map unit. Typically, the surface layer is yellowish brown silt loam about 6 inches thick. The upper part of the subsoil, to a depth of about 24 inches, is yellowish red silty clay loam. The lower part of the subsoil to a depth of 60 inches is yellowish red silty clay with light brownish gray mottles.

This Tippah soil ranges from very strongly acid to medium acid throughout. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is medium, and the erosion hazard is severe. A perched water table is within 2.0 to 2.5 feet of the surface and above the clay layer in winter and early in spring.

About 20 percent of the association consists of small areas of minor soils. These include steep Maben and Smithdale soils on side slopes, Lexington and Providence soils on ridgetops, and Oaklimeter and Chenneby soils in narrow drainageways.

The soils of this association are used primarily for woodland. They are poorly suited to row crops, small grains, and pasture because of steep slopes and the severe erosion hazard. However, small areas of the Tippah soil are well suited to pasture.

The soils are moderately suited to loblolly pine, shortleaf pine, Shumard oak, and white oak. The Tippah soil has slight limitations for woodland management. The Wilcox soil is moderately limited for woodland management by poor trafficability in wet weather because it is shallow to clay. This limitation can be overcome by logging during drier periods.

These soils are severely limited for urban uses by the steep slopes, wetness, and high shrink-swell properties. The very slow to slow permeability of both soils is a severe limitation for septic tank absorption fields, but this limitation can be partially overcome by increasing the size of the absorption field.

The Wilcox soil is in capability subclass VIIe and woodland suitability group 3c2. The Tippah soil is in capability subclass IVe and woodland suitability group 3o7.

use and management of the soils

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

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

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

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

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

crops and pasture

W. A. Hannaford, soil conservationist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

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

About 96,400 acres in the survey area were used for crops and pasture according to the 1974 Census of Agriculture (*19*). Of this total, 67,800 acres were used for permanent pasture; 28,000 acres for row crops, mainly cotton, corn, and soybeans; 500 acres for close-growing crops, mainly wheat and oats; and 5,900 acres for rotation hay and pasture and other crops.

The soils in Lafayette County have good potential for increased production of food and fiber. About 32,000 acres of potentially good cropland are currently used as woodland and about 20,000 acres as pasture. In addition to the reserve productive capacity represented by this land, production can also be increased considerably by extending the latest crop production technology to all cropland in the survey area. This soil survey can help facilitate the application of such technology.

The acreage in crops, mainly soybeans, has increased in the last several years, and pasture acreage has decreased slightly. Suitability and limitations for specific uses of the land are discussed in the section "General soil map units."

Soil erosion is the major concern on more than two-thirds of the land in Lafayette County. If the slope is more than 2 percent, erosion is a hazard. Grenada, Providence, and Tippah soils, for example, have slopes of 2 to 5 percent. They also have wetness problems.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils with a clayey subsoil, such as Maben, Tippah, and Wilcox soils, and on soils that have a layer in or below the subsoil that limits the depth of the root zone. Such layers include a fragipan, as in Calloway, Grenada, Loring, and Providence soils. Second, soil erosion on farmland results in sediment entering streams and lakes. Control of erosion minimizes the pollution of streams by sediment and improves quality of water for municipal use, for recreation, and for fish and wildlife.

In many sloping fields, preparing a good seedbed and tilling are difficult on clayey or hardpan spots because the original friable surface soil has been eroded away. Such spots are common in areas of moderately eroded Providence and Tippah soils.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps plant cover on the soil for extended periods can hold soil erosion losses to amounts that will not reduce the productive capacity of the soils. On livestock farms, which require pasture and hay, the legume and grass forage crops in the cropping system reduce erosion on sloping land and also provide nitrogen and improve tilth for the next crop.

Terraces and diversions reduce the length of slope and reduce runoff and erosion. They are most practical on well drained soils that have regular slopes. Many areas of Lexington and Loring soils and, in some places, Providence soils are generally suitable for terraces. Other soils are less suitable because they have irregular or steep slopes.

Contouring and contour stripcropping can be used in the survey area to control erosion. They are best adapted to soils with smooth, uniform slopes, including many areas of the Grenada, Lexington, and Loring soils.

Where slopes are so short and irregular that contour tillage or terracing is not practical, erosion can be controlled by minimum tillage or a cropping system that provides substantial plant cover. Minimizing tillage and leaving crop residue on the surface increase infiltration and reduce runoff and the hazard of erosion. These practices can be adapted to most soils in the survey area, but they are more difficult to use successfully on the severely eroded soils. No-tillage for corn and soybeans is effective in reducing erosion on sloping land and can be adapted to many soils in the county.

Information for the design of erosion control practices for each kind of soil is available from the local office of the Soil Conservation Service.

Soil drainage is the major management need on about one-third of the acreage used for crops and pasture in the survey area. All of the soils on flood plains need artificial drainage to achieve maximum production.

Unless artificially drained, the somewhat poorly drained soils are so wet that crops are damaged during most years. These include the Arkabutla, Chenneby, and Gillsburg soils, which make up about 35,000 acres of cropland and pasture.

Oaklimeter and Kirkville soils have good natural drainage most of the year, but they tend to dry out slowly after rains. Small areas of wetter soils along drainageways and in swales are commonly included in mapped areas of the well drained Cascilla, Jena, and Ochlockonee soils. Artificial drainage is needed in some of these wetter areas to achieve highest production. Nearly level Calloway soils are on broad upland ridges and terraces. They also require artificial drainage to achieve maximum production.

The design of drainage systems varies with the kind of soil, the size of the area to be drained, and the kind of plant cover. Information on drainage design for each kind of soil is available from local offices of the Soil Conservation Service.

Soil fertility is naturally low in most soils of the uplands. All of the soils are naturally acid. The soils on flood plains range from medium acid to very strongly acid and are naturally higher in plant nutrients than most soils on uplands.

Many soils on uplands are very strongly acid in their natural state. If they have never been limed, applications of ground limestone are required to raise the pH level sufficiently for good growth of soybeans and other crops that grow well on nearly neutral soils. The available phosphorus and potash levels are naturally low in most of these soils. Additions of lime and fertilizer on all soils should be based on the results of soil tests, on the need of the crop, and on the expected yields. The Cooperative Extension Service will help in determining the kinds and amounts of fertilizer and lime to apply.

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

Most of the soils used for crops in the survey area have a silt loam surface layer that is light in color and low in content of organic matter. Generally the structure of such soils is weak, and heavy rainfall causes the formation of a crust on the surface. The crust is hard when dry, and it is nearly impervious to water. Once the crust forms, it reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material improve soil structure and reduce crust formation.

Fall plowing is generally not a good practice on the light-colored soils that have a silt loam surface layer, because a crust forms during the winter and in spring. Many of the soils are nearly as dense and as hard at planting time as they were before they were plowed in the fall. Many are also sufficiently sloping to be subject to damaging erosion if plowed in the fall.

Field crops suited to the soils and climate of the survey area include many that are not now commonly grown. The common row crops are cotton, corn, and soybeans. Grain sorghum, sunflowers, millet, cowpeas, field beans, peanuts, potatoes, and similar crops can be grown.

Wheat and oats are the common close-growing crops. Rye and barley can be grown, and grass seed can be produced from dallisgrass, fescue, and bahiagrass.

The row crops are best suited to the occasionally flooded Arkabutla, Cascilla, Chenneby, Gillsburg, Jena, Kirkville, Oaklimeter, and Ochlockonee soils and the nearly level to sloping Calloway, Grenada, Lexington, Loring, Providence, and Tippah soils. The close-growing crops and grasses are suited to these soils, and they can also be grown on the steeper phases of these and other soils.

Special crops grown for home and commercial use in the survey area are vegetables, fruits and nuts, and nursery plants. A small acreage throughout the survey area is used for melons, strawberries, sweet corn, tomatoes, and other vegetables and small fruits. In addition, areas can be adapted to other special crops such as cucumbers, okra, and peppers. Apples, peaches, pears, and pecans are the most important orchard crops grown in the survey area.

Soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables. In the survey area, these are the Cascilla, Jena, Kirkville, Oaklimeter, and Ochlockonee soils on flood plains and the nearly level to sloping Lexington, Loring, and Providence soils on uplands. Orchards and nursery plants are best suited to the well drained Lexington and Smithdale soils, except in the steeper areas that are more susceptible to erosion.

The latest information and suggestions for growing special crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. 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.

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 5 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.

land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider 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 VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use. There are no class I soils in Lafayette County.

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

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

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

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

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

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

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production. There are no class VIII soils in Lafayette County.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

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

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Joseph V. Zary, forester, Soil Conservation Service, helped prepare this section.

This section contains information on the relationship between trees and their environment, particularly the soils on which they grow. It also includes information on woodland resources and the industries they support. Also included are interpretations of soils that can be used by owners of woodland, foresters, forest managers, and agricultural workers to develop and carry out plans for profitable tree farming.

The environment in which trees grow is a complex of numerous interrelated physical and biological factors (*11*). Physical factors include those of the climate, such as radiation, precipitation, and movement and composition of the air. They also include soil factors, such as texture, structure, depth, moisture capacity and drainage, nutrient content, and topographic position. Biological factors are the associated plants; the larger animals that use the forest as a source of food and shelter; the many small animals, insects, and insectlike animals; mycorrhizae, the fungi to which the trees are hosts; and the myriads of microorganisms whose functions are mainly beneficial to the tree.

Mycorrhizae exert a beneficial influence in stimulating tree growth. Their role in the health and growth of trees has been emphasized by recent research findings, much of which can now be put to use. Timber growers ought to be interested, because mycorrhizae exist on most trees. The ectomycorrhizae form on the feeder roots of pine, beech, hickory, and most oaks. The endomycorrhizae form within the feeder root cortical tissues of sycamore, sweetgum, ash, yellow-poplar, boxelder, locust, maple, and many other hardwoods (*4*).

Soil is possibly the most important environmental factor influencing tree growth and woodland species composition. It is a reservoir for moisture and provides all the essential elements required in tree growth, except carbon and oxygen.

Of the many elements found in plant tissues, about 15 are considered indispensable for the growth of trees. The 10 most important are carbon, oxygen, hydrogen, nitrogen, sulfur, phosphorus, potassium, calcium, magnesium, and iron. Boron, manganese, zinc, copper, and molybdenum are minor elements important to tree growth.

Although trees withdraw nutrients from the soil, their general effect is to enrich rather than to exhaust it. The roots of the trees draw large quantities of soluble salts from the lower strata of the subsoil and deposit them in the leaves and twigs during growth and transpiration. When the leaves fall, these salts are deposited on the surface, where they gradually decompose and enrich the surface soil. Thus, the nutrients that trees need for growth are continually entering and leaving the soil in a process referred to as the nutrient cycle. Rain and wind shower nutrients on the soil; leaching and soil drainage remove them. The weathering of parent material adds nutrients continually. Harvesting of trees and other activities of man take them away (*3*). The result is a dynamic balance: Soil nutrients are always present in the soil, but they are also continually coming and going.

Forests also serve as storehouses of energy. Energy transmitted daily from the sun is trapped by the photosynthesizing of forest vegetation, which falls to the ground as forest litter and is eventually incorporated into the soil as humus. Part of this humus is contributed by animals (*20*).

The soil also provides the medium in which a tree is anchored. The many characteristics of soil, such as chemical composition, texture, structure, depth, and position, affect the growth of a tree to the extent to which they affect the supply of moisture and nutrients. A number of studies have shown strong, but often indirect, correlations between the productivity of the site and these soil characteristics. The ability of a soil to supply water and nutrients to trees is strongly related to its texture, structure, and depth. Sands contain only a small amount of plant nutrients and are low in available water capacity. Fine-textured clays are higher in plant nutrients and have higher available water capacity.

Aeration is impeded in clays, especially when wet. The lack of air, in turn, inhibits the metabolic processes in the roots that require oxygen. The position on the landscape strongly influences species composition, as well as the growth of individual trees. Moisture-loving species, such as sweetgum and yellow-poplar, thrive on moderately moist, well drained, loose-textured soils on lower to middle parts of side slopes and in coves and areas adjoining streams. Species such as oaks, hickories, and pines grow well on middle parts of side slopes and moderately well on upper parts and on ridges. Silvicultural practices that prevent the destruction of organic matter and the compaction of soil are important in maintaining suitable soil moisture and aeration. Practices such as sanitation cutting to remove trees killed or injured by fire, insects, and fungi; cutting to improve species composition and stand condition; and thinning to increase rate of growth and improve composition and quality increase the total yield of timber and income and result in long-term benefits for woodland soils and the environment.

woodland resources

Approximately 235,200 acres in Lafayette County are classified as commercial forest (*17, 14*). About 36,900 acres are National forest; 51,800 acres are owned by farmers; 129,500 acres are owned by miscellaneous private owners; 16,800 acres are owned by the forest industry; and 200 acres are in other public ownership.

According to the 1967 Conservation Needs Inventory for Mississippi, 98,389 acres of the commercial forest land were considered to have adequate conservation treatment. The rest needed further treatment. Tree planting, site preparation, natural seeding, and direct seeding were needed on 75,600 acres. Release cutting of unwanted or competing vegetation, salvage and sanitation cuttings, and thinning were needed on 31,111 acres. These treatments and practices are especially needed on woodlands owned by farmers and miscellaneous private owners. Generally, these woodlands throughout the county receive low to medium levels of management and produce far less than their potential. Establishment of the needed practices would greatly increase yields of tree crops and the income of the woodland owners.

The commercial forest may be subdivided into forest types. These are stands of trees of similar character, composed of the same species, and growing under the same ecological and biological conditions. These forest types are named for the species which are present in the greatest abundance and frequency (*9, 6*).

The *oak-hickory* forest type, composed mainly of upland oaks and hickories, is most important. It occupies approximately 72,800 acres throughout the county. Common associates in this forest type are maple, elm, yellow-poplar, and some pine and black walnut (*13, 14, 15, 9, 18*).

The *loblolly-shortleaf pine* forest type, composed of loblolly and shortleaf pines, singly or in combination, occupies approximately 84,000 acres. Common associates include oak and hickory, sweetgum, and blackgum.

The *oak-pine* forest type, composed mainly of upland oaks and mixtures of loblolly and shortleaf pines, occupies about 61,600 acres. Common associates include sweetgum, blackgum, hickories, and yellow-poplar.

These three forest types make up about 93 percent of the total commercial forest in the county. These forest types are so intermingled that it is difficult to delineate them on a map or by geographic description. Generally, the oak-hickory forest type occupies the western third of the county, which is the upper thick loess part of the Southern Mississippi Valley Silty Uplands. The oak-pine and loblolly-shortleaf pine forest types are intermingled in the eastern two-thirds of the county, which is the upper portion of the Southern Coastal Plain (*10*).

In natural stands, the shortleaf pine is much more abundant than the loblolly pine. As a result of the extensive tree planting program of the Yazoo-Little Tallahatchie Flood Prevention Project, however, loblolly pine plantations occupy some 70,000 acres throughout the county. Cumulative records for the period 1948 through 1977 indicate that 96.5 million pine seedlings, mostly loblolly pine, were planted on some 83,500 acres in Lafayette County.

Purposes of the planting were to arrest soil erosion, reduce sedimentation, and prevent flooding. Many large gullies and thousands of acres of eroding land have been stabilized and now support stands of pine. Some 13,000 acres of loblolly pine plantations have been clearcut and either converted to other land uses or allowed to revert to idle status.

There is one bottom-land forest type in the county. The *oak-gum-cypress* forest type, composed of tupelo, blackgum, sweetgum, oaks, and southern cypress, covers about 16,800 acres. Common associates are cottonwood, willow, ash, elm, hackberry, and maple. This forest type is mainly on the flood plains of the Little Tallahatchie and Yocona Rivers, which drain both the northern and southern parts of the county. In recent years, some of this bottom-land forest has been converted to cropland and pasture for economic reasons.

In 1977, the woodlands of Lafayette County supported 696.5 million board feet of sawtimber, of which 369.5 million was softwood, mostly pine, and 327.0 million was hardwood, including 238.6 million of oak and 39.2 million of gum. The growing stock of all species totaled 218.2 million cubic feet (3.08 million cords), including 111.3 million cubic feet (1.48 million cords) of softwood and 106.9 million cubic feet (1.03 million cords) of hardwood.

In 1976, the growing stock of all species increased 15.7 million cubic feet, and the net annual growth of commercial sawtimber was 43.4 million feet. Some 7.4 million board feet of commercial sawtimber was removed in that year, including 4.8 million board feet of softwood and 2.6 million of hardwood.

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 (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *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: x, w, t, d, 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 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. Site index was determined at age 30 years for eastern cottonwood, age 35 for American sycamore, and age 50 for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

environmental plantings

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To insure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning screens. Additional information on planning screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a nursery.

recreation

Lafayette County has good potential for development of many types of year-round outdoor recreation because of its favorable climate and location. Most of the county is readily accessible from Mississippi State highways throughout the county.

Sardis Reservoir, operated by the U.S. Army Corps of Engineers, is located in the northwestern part of the county. It has several thousand acres of open water that is ideal for boating, fishing, skiing, and swimming. Several areas around the lake have been developed into parks with facilities for boat launching, picnicking, and camping.

The Holly Springs National Forest has several thousand acres of forest land with designated areas for hunting and hiking. One lake has been developed for boating and fishing. Several picnic and camping areas are available.

The Sardis Reservoir and the Holly Springs National Forest provide outdoor recreation for people from distant areas as well as for the local people. Many other areas throughout the county have potential for outdoor recreational development.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

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

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

Paths and trails for hiking, horseback riding, and bicycling 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

By Edward G. Sullivan, biologist, Soil Conservation Service

Man's activities and the way he has used the soils in Lafayette County have greatly influenced the wildlife population. Regardless of how suitable a soil may be for producing wildlife habitat, if its present use eliminates the plant associations that make up the wildlife habitat, the animals will not be there. For this reason the kinds and numbers of wild animals in Lafayette County have varied over the years.

Before the settlers arrived, the area was mostly forest. Hardwoods of many species were the dominant vegetation. Some of the animals that adapted to this type of habitat were squirrels, deer, turkey, panthers, wolves, eagles, and many nongame birds.

The progressive logging and clearing of the forest land by settlers pushed the forest animals into the remote areas. In the place of forest animals came animals adapted to open land. Clearing of fields, logging, burning, and other soil disturbances created a type of vegetation that met the needs of bobwhite quail, rabbits, doves, rodents, reptiles, and many types of ground- and brush-inhabiting songbirds.

These conditions were responsible for some of the largest bobwhite quail populations in the country. As they continued, forest animals declined; wolves, panthers, and later deer and turkeys, disappeared. In modern times, however, reforestation and wildlife management are restoring the balance between forest animals and farm animals. With restocking and management, deer and turkey have been restored. The decline in cultivated acreage and more intensive farming methods have brought about a decline in openland and farm animals. The kinds and numbers of wild animals will continue to change as man's methods and demands on the land change.

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

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

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

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

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

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

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, poplar, cherry, sweetgum, hawthorn, dogwood, hickory, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive and crabapple.

Coniferous plants furnish browse, seeds, and cones. 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 juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity and soil moisture. Examples of shrubs are strawberry bush, oakleaf hydrangea, common buttonbush, and huckleberry.

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, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, cattail, rushes, sedges, cypress, and tupelo gum.

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

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

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

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

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

engineering

Billy P. Hartsell, agricultural engineer, Soil Conservation Service, helped prepare this section.

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

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

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

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

building site development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock, 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 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, 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, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

sanitary facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock, 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 effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

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

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock, 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 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock 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 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help 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 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

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

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

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

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

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

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

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

water management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; 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 for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

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

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; and susceptibility to flooding. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts or sodium. Availability of drainage outlets is not considered in the ratings.

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 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. Low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

soil properties

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

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. 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 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. 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 a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 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 oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

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

physical and chemical properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 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 is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

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

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

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 16, the estimated content of organic matter of the plow layer 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 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

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

The four hydrologic soil groups are:

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

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

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 an average of once or less in 2 years; and *frequent* that it occurs on an average of 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 17 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

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

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 severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

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

physical and chemical analyses of selected soils

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The results of physical and chemical analyses of representative pedons of the survey area are reported in table 18. The samples were collected from representative sites of selected soil series that are important in the survey area.

The analyses were made in the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station. The procedures used were essentially those given in Soil Survey Investigation Report No. 1 (SSIR) (*12*).

Soil samples were collected from excavated pits in Lafayette County. Samples were prepared for analyses by air drying, careful crushing, and screening through a No. 10 sieve. All data are reported on an ovendry basis.

The particle size analyses of these soils were obtained by the hydrometer method of Day (*5*). Forty grams of soil were dispersed in a 0.5 percent sodium phosphate solution by mixing for 5 minutes in a milkshake mixer. The dispersed soil was transferred to a sedimentation cylinder, made to 1,000 ml, and equilibrated overnight in a water bath at 30 degrees Celsius. The suspension was then mixed and allowed to settle. Hydrometer readings were taken at predetermined times to determine clay content. The sand was separated on a 325-mesh sieve, dried, and weighed. The results are expressed on the basis of ovendry weight at 110 degrees Celsius.

The physical properties of soils such as water infiltration and conduction, shrink-swell potential, crusting, ease of tillage, consistence, and available water capacity, are closely related to soil texture (the percentage of sand, silt, and clay).

The deep, sloping, loamy soils of the ridgetops that developed in Coastal Plain materials, such as Smithdale soils, have a high sand content. The coarse textured surface layer enhances water infiltration, and the soils tend to be droughty. The soils that formed in loess materials, such as the Lexington and Cascilla soils, have a very high silt content. These silty soils tend to crust and pack after rains, and they develop plowpans easily during tillage.

Soil chemical properties, in combination with other features such as permeability, structure, texture, and consistence, influence the limitations and potentials of individual soils. Chemical properties are not evident in visual observations of a soil, and laboratory analyses are necessary to determine the soil's characteristics. The amount and type of clay minerals present and the organic matter content largely regulate the chemical nature of soils. These substances have the capacity to attract and retain cations. Exchangeable cations are positively charged elements that are bonded to the negatively charged clay minerals and organic matter.

Exchangeable bases were extracted with neutral 1 *N* ammonium acetate. Calcium, magnesium, potassium, and sodium were determined with a Perkin-Elmer atomic absorption instrument using strontium chloride to suppress interference. Extractable acidity (hydrogen + aluminum) was extracted with barium chloride-triethanolamine solution buffered to pH 8.2 and determined via back titration with standard hydrochloric acid.

The percentage of base saturation was calculated by dividing the sum of the bases (calcium, magnesium, sodium, and potassium) by the sum of the cations and multiplying by 100. The sum of the cations includes, in addition to the bases, the extractable acidity (hydrogen + aluminum).

Organic matter was determined by a wet combustion method using sulfuric acid and potassium dichromate mixture and back titration with ferrous sulfate.

Soil reaction (pH) was determined with a Coleman pH meter using a glass electrode and a 1:1 ratio of soil and water.

Soil chemical data are expressed as milliequivalents (meq) per 100 grams of dry soil. It is useful to convert milliequivalents per 100 grams of the various cations to the common units of pounds per acre for the plow layer. An acre of plow layer, or topsoil, of average soil to a depth of 6.67 inches weighs about 2,000,000 pounds. The converions for the cations listed in table 18 are as follows:

Calcium meq/100 grams x 400 = pounds per acre
Magnesium meq/100 grams x 240 = pounds per acre
Potassium meq/100 grams x 780 = pounds per acre
Sodium meq/100 grams x 460 = pounds per acre
Hydrogen meq/100 grams x 20 = pounds per acre

The exchangeable cations in soils are electrostatically held, which prevents leaching, yet they are available to plants. Soils can adsorb cations to the limit of their exchange capacity. The exchangeable cations may be replaced by substituting other cations for them. It is through the mechanism of cation exchange that soil acidity is corrected by liming and that soils become acid again after the bases have been removed. It is useful to note that 1 meq/100 g of extractable acidity requires 1,000 pounds of calcium carbonate (lime) to neutralize it.

Many of the soils in Lafayette County are acid and have a relatively low capacity to retain plant nutrients (cations) because of the influence of their siliceous parent materials. These soils, like the Smithdale soils respond to proper fertilization and management. Liming has raised the base saturation in the surface layers of the Cascilla and Chenneby soils.

Magnesium is the dominant basic exchangeable cation in these soils, particularly in the deeper horizons. The soils have a calcium/magnesium ratio of less than 1 in most horizons. In these highly leached soils, the calcium has been largely removed and the magnesium may be released from the clay minerals. Exchangeable sodium is low or absent in most horizons.

The soil taxonomy adopted by the National Cooperative Soil Survey uses chemical soil properties as differentiating criteria in some categories of the system (*16*). The Alfisol and Ultisol orders, which are classes in the highest category of the system, are separated on the basis of percentage base saturation deep in the subsoil. Ultisols have an argillic horizon that has a base saturation of less than 35 percent; Alfisols have base saturation greater than 35 percent. The Lexington soil is an Alfisol, and it has a base saturation value greater than 35 percent at a depth of 4 feet. The degree of weathering is inversely related to base saturation, since this is a measure of the extent of replacement of bases by hydrogen and aluminum during the leaching process.

engineering index test data

Table 19 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil series and their morphology." The soil samples were tested by the Mississippi State Highway Department, Testing Division, Jackson, Mississippi.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) (*1*) or the American Society for Testing and Materials (ASTM) (*2*).

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); and Shrinkage—T 92 (AASHTO), D 427 (ASTM).

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*16*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 20, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

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

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Fluvent (*Fluv*, meaning flood plain, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Udifluvent (*Ud*, meaning moist horizonation, plus *Fluvent*, the suborder of the Entisols that have an Udic 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 Udifluvents.

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

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series. The Ochlockonee series is an example of coarse-loamy, siliceous, acid, thermic Typic Udifluvents in Lafayette County.

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 (*8*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*16*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

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

Arkabutla series

The Arkabutla series consists of somewhat poorly drained, nearly level soils that formed in silty alluvium on broad flood plains. Slopes range from 0 to 2 percent.

Arkabutla soils are associated with Cascilla, Chenneby, and Gillsburg soils. Arkabutla soils differ from Cascilla and Chenneby soils by being grayer in the upper 20 inches. Cascilla soils are well drained. Gillsburg soils have more clay in the 10- to 40-inch section.

Typical pedon of Arkabutla silt loam, occasionally flooded; 4 miles east of Tula, one-half mile north of road and 600 feet east of McCloons Creek; NW1/4SE1/4 sec. 3, T. 10 S., R. 1 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; few fine faint grayish brown mottles; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

B21—5 to 15 inches; yellowish brown (10YR 5/4) silt loam; common fine faint pale brown (10YR 6/3), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine and medium black and dark brown concretions; common patchy black stains on faces of peds; few fine and medium roots; very strongly acid; gradual smooth boundary.

B22g—15 to 22 inches; light brownish gray (2.5Y 6/2) silt loam; common medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine and medium black and dark brown concretions; few fine and medium roots; very strongly acid; gradual smooth boundary.

B23g—22 to 32 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine and medium black and dark brown concretions; few fine charcoal flakes; very thin silt coatings on faces of peds; few fine and medium roots; very strongly acid; gradual smooth boundary.

B24g—32 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; many medium distinct yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; common fine and medium black and dark brown concretions; few patchy black stains on faces of peds; few fine and medium roots; very strongly acid.

Reaction is very strongly acid or strongly acid throughout except where the surface horizon has been limed. The clay content ranges from 20 to 35 percent between depths of 10 and 40 inches.

The A horizon is dark brown, brown, or dark yellowish brown. The B21 horizon is dark brown, brown, or yellowish brown with gray mottles, or it is dark grayish brown or grayish brown with brownish and yellowish mottles, or it is mottled in shades of brown, yellow, and gray. Texture is silt loam or silty clay loam. The Bg horizon is dark grayish brown, grayish brown, light grayish brown, or gray and is mottled in shades of brown. Texture is silt loam or silty clay loam.

Bruno series

The Bruno series consists of excessively drained, nearly level soils that formed in sandy alluvium on broad flood plains. Slopes range from 0 to 2 percent.

The Bruno soils are associated with Oaklimeter and Ochlockonee soils. The Bruno soils are excessively drained and contain more sand in the 10- to 40-inch section than the associated soils. The Oaklimeter soils are silty throughout.

Typical pedon of Bruno loamy sand in an area of Ochlockonee-Bruno complex, frequently flooded; 1.5 miles west of Oxford, 100 feet north of State Highway 6, 30 feet west of West Goose Creek; SE1/4NE1/4 sec. 27, T. 8 S., R. 4 W.

Ap—0 to 5 inches; yellowish brown (10YR 5/4) loamy sand; single grained; loose; many fine and medium roots; slightly acid; abrupt smooth boundary.

C1—5 to 10 inches; dark yellowish brown (10YR 4/4) sandy loam; single grained; loose; thin horizontal strata of loamy sand; few fine mica flakes; common fine and medium roots; medium acid; clear smooth boundary.

C2—10 to 13 inches; pale brown (10YR 6/3) sand; single grained; loose; slightly acid; clear smooth boundary.

C3—13 to 22 inches; dark yellowish brown (10YR 4/4) loamy sand; single grained; loose; very thin horizontal strata of sand; slightly acid; clear smooth boundary.

C4—22 to 41 inches; pale brown (10YR 6/3) sand; single grained; loose; very thin horizontal strata of loamy sand; slightly acid; abrupt smooth boundary.

C5—41 to 60 inches; dark yellowish brown (10YR 4/4) loamy sand; single grained; loose; thin horizontal strata of sandy loam and silt loam; few fine mica flakes; medium acid.

Reaction ranges from strongly acid to mildly alkaline throughout. Thin bedding planes are evident.

The A horizon is dark brown, brown, dark yellowish brown, or yellowish brown. The C horizon is grayish brown, pale brown, brown, dark yellowish brown, or light brownish gray. The 10- to 40-inch section is dominantly loamy sand and sand with thin strata of loamy very fine sand or finer texture.

Calloway series

The Calloway series consists of somewhat poorly drained, nearly level soils that have a fragipan. They formed in silty material on broad, low ridgetops and terraces. Slopes range from 0 to 1 percent.

Calloway soils are associated with Grenada and Providence soils. Calloway soils are not as well drained as Grenada and Providence soils and have gray mottles in the upper 16 inches. Providence soils do not have an A'2 horizon.

Typical pedon of Calloway silt loam, 0 to 1 percent slopes; 7 miles south of Oxford, 900 feet south of State Highway 7 on a gravel road and 400 feet west of gravel road; NE1/4SE1/4 sec. 32, T. 9 S., R. 3 W.

Ap—0 to 7 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; common fine and medium roots; strongly acid; abrupt smooth boundary.

B2—7 to 17 inches; mottled yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and pale brown (10YR 6/3) silt loam; weak medium subangular blocky structure; friable; thin patchy dark brown stains on faces of peds; common fine and medium roots; common fine and medium dark brown and black concretions; very strongly acid; clear irregular boundary.

A'2—17 to 21 inches; pale brown (10YR 6/3) silt loam; common fine faint light yellowish brown (2.5Y 6/4) mottles; weak medium subangular blocky structure; friable, slightly brittle; common fine and medium vesicular pores; common fine and medium dark brown and black concretions; very strongly acid; clear irregular boundary.

B'x1—21 to 32 inches; mottled light brownish gray (10YR 6/2), yellowish brown (10YR 5/6), and gray (10YR 6/1) silty clay loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle and compact in approximately 60 percent of volume; thick discontinuous clay films on faces of peds and prisms; tongues of gray silty material between prisms; common fine black stains on faces of prisms; common fine and medium voids and pores; few fine black concretions; very strongly acid; gradual wavy boundary.

B'x2—32 to 51 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2), dark yellowish brown (10YR 4/6), and gray (10YR 6/1) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle and compact in approximately 60 percent of volume; patchy clay films on faces of peds and prisms; thick gray silty seams between prisms; few fine black concretions; very strongly acid; gradual wavy boundary.

B'x3—51 to 65 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) and dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm, slightly brittle and compact in approximately 60 percent of volume; few patchy clay films on faces of peds; thick gray silty coatings around prisms; noticeable sand in lower part; few fine dark brown concretions; strongly acid.

Reaction ranges from very strongly acid to medium acid throughout.

The A horizon is brown, pale brown, dark grayish brown, or grayish brown. The B2 horizon is yellowish brown or dark yellowish brown with few to many mottles in shades of gray and brown, or it is mottled in shades of gray and brown. Texture is silt loam or silty clay loam. Clay content from a depth of 10 inches to the upper boundary of the fragipan ranges from 18 to 30 percent. The A'2 horizon is grayish brown, light brownish gray, light gray, or pale brown. In some pedons the A'2 horizon is lacking and a horizon of mixed A'2 and B'x material is at the top of the fragipan. The B'x horizon is yellowish brown, light olive brown, or grayish brown with few to many grayish mottles, or the horizon is mottled in brown, gray, and yellow. Texture is silt loam or silty clay loam. The material inside the prism is firm and brittle.

Cascilla series

The Cascilla series consists of well drained, nearly level soils that formed in silty alluvium on broad flood plains. Slopes range from 0 to 2 percent.

Cascilla soils are associated with Arkabutla, Chenneby, and Jena soils. Cascilla soils are browner and better drained than either Arkabutla or Chenneby soils. Cascilla soils contain more clay and less sand throughout the solum than Jena soils.

Typical pedon of Cascilla silt loam, occasionally flooded; approximately 6 miles south of Oxford, 200 feet east of State Highway 7; SE1/4NW1/4 sec. 28, T. 9 S., R. 3 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; common fine and medium roots; black stains along medium root channels; very strongly acid; abrupt smooth boundary.

B21—5 to 28 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual smooth boundary.

B22—28 to 38 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct light brownish gray mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual smooth boundary.

B23—38 to 44 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and common medium faint yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine dark brown concretions; very strongly acid; gradual smooth boundary.

B3—44 to 65 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 6/2) and common medium faint dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; few fine voids; few fine black concretions; very strongly acid.

Reaction is very strongly acid or strongly acid throughout except where the surface horizon has been limed. The 10- to 40-inch section is 18 to 30 percent clay and less than 15 percent sand coarser than very fine sand.

The A horizon is dark brown, brown, yellowish brown, or dark yellowish brown. The B2 horizon is dark brown, brown, dark yellowish brown, or yellowish brown. Some pedons have few to common mottles in shades of gray and brown below a depth of 24 inches. Texture is silt loam or silty clay loam. The B3 horizon is dark brown, brown, yellowish brown, or dark yellowish brown. Some pedons have mottles in shades of gray. Texture is silt loam or silty clay loam.

Chenneby series

The Chenneby series consists of somewhat poorly drained, nearly level soils that formed in silty alluvium on broad flood plains. Slopes range from 0 to 2 percent.

Chenneby soils are associated with Arkabutla, Cascilla, and Oaklimeter soils. Chenneby soils are not as gray in the upper 20 inches as Arkabutla soils. Chenneby soils differ from Cascilla soils by having gray mottles in the upper 24 inches. Chenneby soils are not as well drained as Cascilla and Oaklimeter soils, and they also have a higher clay content in the 10- to 40-inch section than Oaklimeter soils.

Typical pedon of Chenneby silt loam, occasionally flooded; 6 miles south of Oxford, 500 feet east of Highway 7 and 300 feet south of Yocona River; SE1/4NW1/4 sec. 28, T. 9 S., R. 3 W.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

B1—6 to 18 inches; dark brown (10YR 4/3) silt loam; few medium faint brown (10YR 5/3) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual smooth boundary.

B21—18 to 31 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and common medium faint dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual smooth boundary.

B22—31 to 46 inches; mottled light brownish gray (10YR 6/2), yellowish brown (10YR 5/4), and dark yellowish brown (10YR 4/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; few fine dark brown concretions; very strongly acid; gradual smooth boundary.

Cg—46 to 65 inches; light brownish gray (10YR 6/2) silt loam, many medium yellowish brown (10YR 5/4), brown (10YR 5/3), and dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; friable; common medium and fine dark brown concretions; common fine and medium vesicular pores; very strongly acid.

Reaction ranges from very strongly acid to medium acid throughout. The 10- to 40-inch control section is 20 to 35 percent clay and less than 10 percent sand coarser than very fine sand.

The A horizon is dark brown, dark yellowish brown, or dark grayish brown. Some pedons have few to common mottles in shades of gray and brown in the lower part of the A horizon. The B1 horizon is brown or dark brown with few to many mottles in shades of gray and brown. Texture is silt loam or silty clay loam. The B2 horizon ranges from dark brown to yellowish brown with common to many mottles in shades of gray and brown, or it is mottled in shades of gray and brown. Texture is silt loam or silty clay loam. The C horizon is light brownish gray with many mottles in shades of brown and gray, or it is mottled in shades of brown and gray. Texture is silt loam or silty clay loam.

Gillsburg series

The Gillsburg series consists of somewhat poorly drained, nearly level soils that formed in silty alluvium on broad flood plains. Slopes range from 0 to 2 percent.

Gillsburg soils are associated with Arkabutla, Kirkville, and Oaklimeter soils. Gillsburg soils differ from Arkabutla soils by having less than 18 percent clay in the 10- to 40-inch section. Gillsburg soils are not as well drained as Kirkville soils and have more silt and less sand in the 10- to 40-inch section. Gillsburg soils are grayer in the upper 20 inches than Oaklimeter soils and are not as well drained.

Typical pedon of Gillsburg silt loam, occasionally flooded; 2,300 feet north of Yocona River; 400 feet south of gate; NE1/4SE1/4 sec. 21, T. 9 S., R. 3 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; common fine and medium roots; slightly acid; abrupt smooth boundary.

B21—5 to 15 inches; brown (10YR 5/3) silt loam; common medium distinct light brownish gray (10YR 6/2), and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few patchy dark brown stains on faces of peds; few fine black concretions; common fine and medium roots; strongly acid; gradual smooth boundary.

B22—15 to 33 inches; light brownish gray (2.5Y 6/2) silt loam; common medium faint pale brown (10YR 6/3) and common medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; common fine and medium brown and black concretions; common fine and medium voids; few fine roots; strongly acid; clear irregular boundary.

A2b&Bgb—33 to 46 inches; light brownish gray (2.5Y 6/2) silt loam; common medium faint light yellowish brown (2.5Y 6/4) and common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; friable; common fine and medium brown and black concretions; common fine and medium voids; few fine roots; strongly acid; clear irregular boundary.

Bgb—46 to 60 inches; mottled light gray (10YR 7/1), yellowish brown (10YR 5/6), and light yellowish brown (10YR 6/4) silt loam; weak coarse prismatic structure parting to weak medium subangular blocky; friable; common fine brown and black concretions; common fine voids; strongly acid.

Reaction is very strongly acid or strongly acid throughout except where the surface horizon has been limed. The buried soil horizons are similar in color and reaction to the B22 horizon.

The Ap horizon is brown, dark brown, or dark grayish brown. The B21 horizon is dark brown, dark yellowish brown, or brown, or it is mottled in shades of gray and brown. The B22 horizon is light brownish gray, grayish brown, or gray with mottles in shades of gray and brown, or it is mottled in shades of these colors. The A2b&Bgb horizon is light brownish gray, gray, or light gray with mottles in shades of gray or brown, or it is mottled in shades of gray and brown.

Grenada series

The Grenada series consists of moderately well drained, nearly level and very gently sloping soils that have a fragipan. These soils formed in silty material on broad upland ridgetops and stream terraces. Slopes range from 0 to 3 percent.

Grenada soils are associated with Calloway, Loring, and Providence soils. Grenada soils differ from Calloway soils by being better drained and not having gray mottles in the upper 16 inches. Grenada soils differ from Loring and Providence soils by having a grayish A'2 horizon above the fragipan. Also, Grenada soils are more silty and less sandy in the lower part of the fragipan than Providence soils.

Typical pedon of Grenada silt loam, 1 to 3 percent slopes; 5 miles west of Oxford on State Highway 314, left on private road 2,000 feet, 50 feet south of field road; SW1/4SW1/4 sec. 33, T. 7 S., R. 4 W.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; common fine and medium roots; strongly acid; abrupt smooth boundary.

B21—6 to 15 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few fine black concretions; common fine and medium roots; very strongly acid; gradual smooth boundary.

B22—15 to 21 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; common medium and fine black and dark brown concretions; thin pale brown silt coatings on faces of peds; very strongly acid; abrupt wavy boundary.

A'2—21 to 24 inches; very pale brown (10YR 7/3) silt loam, common medium distinct dark yellowish brown (10YR 4/6) mottles; weak fine and medium subangular blocky structure; friable, slightly brittle; many fine voids and pores; common fine and medium dark brown concretions; very strongly acid; abrupt irregular boundary.

B'x1—24 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam, many medium distinct light gray (10YR 7/2) and many medium faint yellowish brown (10YR 5/4) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle in approximately 60 percent of the volume; thick discontinuous clay films on faces of peds and prisms; tongues of gray silty material between prisms; common fine and medium black and dark brown concretions; common fine and medium voids and pores; very strongly acid; gradual wavy boundary.

B'x2—32 to 65 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle in approximately 60 percent of the volume; patchy clay films on faces of peds and prisms; thick gray seams around prisms; few fine black concretions; strongly acid.

Reaction ranges from very strongly acid to medium acid throughout, except where the surface horizon has been limed.

The A horizon is grayish brown, dark brown, or yellowish brown. The B2 horizon is yellowish brown or dark yellowish brown. Texture is silt loam or silty clay loam. The A'2 horizon is light gray, light brownish gray, or very pale brown and is generally mottled with shades of brown. In some pedons this is an A'&B' horizon in which bodies of B horizon material are an important part of the mass. The B'x horizon is dark yellowish brown, yellowish brown, or brown mottled with shades of gray and brown or is mottled in shades of gray, brown, and yellow. Texture is silty clay loam or silt loam.

Jena series

The Jena series consists of well drained, nearly level soils that formed in loamy alluvium on broad flood plains. Slopes range from 0 to 2 percent.

Jena soils are associated with Cascilla, Kirkville, and Ochlockonee soils. Jena soils have less clay and more sand in the 10- to 40-inch control section than Cascilla soils. Jena soils are better drained than Kirkville soils. Jena soils have more profile development than the stratified Ochlockonee soils.

Typical pedon of Jena fine sandy loam, occasionally flooded; 6 miles south of Oxford on State Highway 7, east about 3 miles on blacktop road, north about 1 mile on a gravel road, 20 feet east of road; SW1/4SW1/4 sec. 23, T. 9 S., R. 3 W.

Ap—0 to 7 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

B21—7 to 19 inches; yellowish brown (10YR 5/4) fine sandy loam; common fine faint dark yellowish brown mottles; weak medium subangular blocky structure; very friable; common very fine, fine, and medium roots; slightly acid; gradual smooth boundary.

B22—19 to 38 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; common fine and medium pores; very strongly acid; gradual smooth boundary.

C—38 to 60 inches; yellowish brown (10YR 5/6) sandy loam; structureless; very friable; very strongly acid.

The reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon is dark brown or brown. The B horizon is brown, dark yellowish brown, yellowish brown, light yellowish brown, or strong brown. Texture ranges from silt loam to loamy fine sand. The texture of the 10- to 40-inch control section averages 20 to 40 percent sand coarser than very fine sand. The C horizon is brown, dark yellowish brown, yellowish brown, or light yellowish brown. Some pedons have common to many mottles in shades of gray, brown, and yellow in the C horizon. Texture ranges from fine sandy loam to loamy fine sand.

Kirkville series

The Kirkville series consists of moderately well drained, nearly level soils that formed in loamy alluvium on broad flood plains. Slopes range from 0 to 2 percent.

Kirkville soils are associated with Gillsburg, Jena, and Ochlockonee soils. Kirkville soils contain more sand and are better drained than Gillsburg soils. Kirkville soils have gray mottles above 24 inches and are not as well drained as Jena soils. Kirkville soils are grayer than Ochlockonee soils, are not as well drained, and are not stratified.

Typical pedon of Kirkville fine sandy loam, occasionally flooded; 7 miles south of Oxford, 500 feet north of State Highway 7; NE1/4NE1/4 sec 32, T. 9 S., R. 3 W.

Ap—0 to 9 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine granular structure; friable; few fine and medium roots; strongly acid; abrupt smooth boundary.

B21—9 to 24 inches; light olive brown (2.5Y 5/4) loam; common medium distinct light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/4 and 10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine and medium dark brown and black concretions; few fine roots; strongly acid; clear smooth boundary.

B22—24 to 33 inches; mottled light olive brown (2.5Y 5/4), yellowish brown (10YR 5/4), and light gray (2.5Y 7/2) loam; weak medium subangular blocky structure; friable; common fine and medium vesicular pores; patchy dark brown and black stains on faces of peds and in pores; common fine and medium dark brown concretions; strongly acid; gradual smooth boundary.

B23g—33 to 60 inches; light brownish gray (2.5Y 6/2) loam; common fine and medium distinct yellowish brown (10YR 5/6) and light yellowish brown (2.5Y 6/4) mottles; weak medium subangular blocky structure; friable; patchy dark brown stains on faces of peds; few fine dark brown concretions; few fine vesicular pores; strongly acid.

The reaction is very strongly acid or strongly acid throughout except where the surface horizon has been limed.

The A horizon is dark grayish brown, dark brown, dark yellowish brown, or brown. The B21 horizon is dark brown, dark yellowish brown, light olive brown, or yellowish brown with grayish mottles, or the horizon is mottled in shades of gray and brown. Texture is loam, fine sandy loam, or sandy loam. The B22 horizon is similar in color to the B21 horizon but has few to many grayish mottles, or the horizon is mottled in shades of brown and gray. Texture is loam, fine sandy loam, or sandy loam. The B23g horizon is grayish brown, light brownish gray, or gray with mottles in shades of brown and yellow, or it is mottled in shades of brown, yellow, and gray. Texture is loam, fine sandy loam, or sandy loam.

Lexington series

The Lexington series consists of well drained, gently sloping to moderately steep soils that formed in a thin mantle of silty material underlain by loamy material on uplands. Slopes range from 2 to 15 percent.

Lexington soils are associated with Loring, Lucy, and Smithdale soils. Lexington soils are better drained than Loring soils, do not have a fragipan, and have more sand in the lower part of the subsoil. Lexington soils have more silt than Lucy and Smithdale soils and have less than 15 percent sand in the upper part of the subsoil. Lucy soils are loamy sand in the upper 20 to 40 inches.

Typical pedon of Lexington silt loam, 2 to 5 percent slopes, eroded; 5 miles east of Oxford on State Highway 30, left 1 mile on gravel road, 100 feet north of gravel road; NE1/4NW1/4 sec. 8, T. 8 S., R. 2 W.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine and medium roots; neutral; abrupt smooth boundary.
B21t—6 to 24 inches; dark brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; discontinuous clay films on faces of peds; few fine and medium roots; few patchy black coatings on faces of peds; slightly acid; gradual smooth boundary.
B22t—24 to 34 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; thin discontinuous silt coatings on faces of peds; few patchy black coatings on faces of same peds; few very fine and fine roots; medium acid; gradual smooth boundary.
IIB23t—34 to 56 inches; yellowish red (5YR 4/6) loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; few pockets of uncoated sand grains; few fine black concretions; few very fine and fine roots; medium acid; gradual smooth boundary.
IIB24t—56 to 72 inches; red (2.5YR 4/6) sandy loam; common medium distinct yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds and in pores; few pockets of uncoated sand grains; few very fine and fine roots; medium acid.

The reaction ranges from very strongly acid to medium acid throughout except where the surface horizon has been limed.

The A horizon is dark brown, brown, dark yellowish brown, or yellowish brown. The B21t and B22t horizons are dark brown, strong brown, yellowish red, or reddish brown. Texture is silt loam or silty clay loam. The IIB horizon is dark brown, yellowish red, reddish brown, or red. Texture is loam or sandy loam. The depth to a layer containing more than 15 percent sand ranges from 30 to 48 inches. The upper part of the B horizon is less than 15 percent sand, and the amount of sand increases with depth. Some profiles have a few to common skeletans in shades of brown or red.

Loring series

The Loring series consists of moderately well drained, gently sloping or sloping soils that have a fragipan and formed in silty material on uplands. Slopes range from 2 to 8 percent.

The Loring soils are associated with Grenada, Lexington, and Smithdale soils. Loring soils differ from Grenada soils by having a single clay maximum and no A'2 horizon above the fragipan. Loring soils differ from Lexington soils by having a fragipan and less than 15 percent sand throughout. Loring soils have a fragipan and are not as red or as sandy as the Smithdale soils.

Typical pedon of Loring silt loam, 2 to 5 percent slopes, eroded; 4 miles northwest of Oxford on College Hill road, 2 miles north on gravel road, 85 feet west of gravel road; NE1/4SW1/4 sec. 14, T. 7 S., R. 4 W.

Ap—0 to 9 inches; yellowish brown (10YR 5/4) silt loam; weak fine granular structure; friable; many fine and medium roots; medium acid; abrupt smooth boundary.
B21t—9 to 16 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; discontinuous clay films on faces of peds; strongly acid; gradual smooth boundary.
B22t—16 to 24 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine roots; patchy clay films on faces of peds; thin discontinuous silt coatings on faces of peds; common fine pores; strongly acid; gradual smooth boundary.
Bx1—24 to 43 inches; strong brown (7.5YR 5/6) silt loam; common medium distinct yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle and compact in approximately 60 percent of the volume; gray seams between prisms; patchy clay films on faces of peds and prisms; thin discontinuous gray silt coatings on faces of peds; common fine and medium vesicular pores; few fine dark brown and black concretions; strongly acid; gradual smooth boundary.
Bx2—43 to 65 inches; strong brown (7.5YR 5/6) silt loam; few fine distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm, slightly brittle and compact in approximately 60 percent of the volume; gray seams between prisms; thin patchy gray silt coatings on faces of peds; patchy clay films on faces of peds; few fine black concretions; strongly acid.

The reaction ranges from very strongly acid to medium acid throughout except where the surface layer has been limed.

The A horizon is brown or yellowish brown. The Bt horizon is brown, dark yellowish brown, or strong brown. Texture is silt loam or silty clay loam. Clay content of the upper 20 inches of the Bt horizon ranges from 18 to 30 percent. The Bx horizon is brown, strong brown, or dark yellowish brown with mottles in shades of yellow, brown, and gray, or it is mottled in shades of yellow and gray. Texture is silt loam or silty clay loam.

Lucy series

The Lucy series consists of well drained, steep soils that formed in loamy material on uplands. Slopes range from 17 to 30 percent.

Lucy soils are associated with Lexington and Smithdale soils. Lucy soils are sandy throughout the pedon whereas Lexington soils are silty in the upper 30 to 48 inches. Lucy soils differ from Smithdale soils by having a sandy A horizon 20 to 40 inches thick.

Typical pedon of Lucy loamy sand in an area of Smithdale-Lucy association, hilly; approximately 10 miles northeast of Oxford, 1/4 mile south of Cambridge Church, 680 feet west of gravel road; NW1/4NE1/4 sec. 26, T. 7 S., R. 2 W.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

A21—4 to 9 inches; yellowish brown (10YR 5/4) loamy sand; single grained; loose; common fine and medium roots; strongly acid; gradual smooth boundary.

A22—9 to 28 inches; yellowish brown (10YR 5/6) loamy sand; single grained; loose; few fine and medium roots; strongly acid; gradual smooth boundary.

B1—28 to 35 inches; yellowish red (5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; pockets of loamy sand; yellowish brown sandy coatings around peds; very strongly acid; gradual smooth boundary.

B21t—35 to 40 inches; yellowish red (5YR 5/8) sandy loam; moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; discontinuous sandy coatings on faces of peds; very strongly acid; gradual smooth boundary.

B22t—40 to 49 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; patchy clay films and sand grains bridged with clay; discontinuous sandy coatings on faces of peds; very strongly acid; gradual smooth boundary.

B23t—49 to 65 inches; yellowish red (5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; sand grains bridged with clay; thin layers of strong brown loamy sand and sandy coatings on faces of peds; very strongly acid.

The reaction is very strongly acid or strongly acid throughout.

The A horizon is 20 to 40 inches thick and is loamy fine sand, loamy sand, or sand. The Al horizon is very dark grayish brown, dark grayish brown, or grayish brown. The A2 horizon is pale brown, light yellowish brown, or yellowish brown. Some pedons have a yellowish red A3 horizon of loamy sand or loamy fine sand. The B1 horizon is strong brown, yellowish red, or red. The B2t horizon is red or yellowish red. Texture is sandy loam or sandy clay loam. Mottles in shades of yellow or brown occur below a depth of 36 inches in some pedons. Clay content ranges from 20 to 30 percent.

Maben series

The Maben series consists of well drained, moderately steep and steep soils that formed in stratified layers of shaly clay and loamy material on side slopes in the uplands. Slopes range from 12 to 35 percent.

Maben soils are associated with Smithdale, Tippah, and Wilcox soils. Maben soils differ from Smithdale soils by having 35 to 55 percent clay in the upper 20 inches of the Bt horizon. Smithdale soils are loamy throughout the solum. Maben soils are better drained than Tippah soils and have more clay in the upper 20 inches of the Bt horizon. Maben soils are redder and better drained than Wilcox soils.

Typical pedon of Maben fine sandy loam, 12 to 25 percent slopes; 4 miles north of Lafayette Springs, 100 feet east of road and 50 feet north of Forest Service road; NW1/4NE1/4 sec. 24, T. 8 S., R. 1 W.

A1—0 to 5 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; medium acid; abrupt smooth boundary.

B21t—5 to 19 inches; yellowish red (5YR 4/6) clay; strong fine and medium subangular and angular blocky structure; firm, plastic and sticky; continuous clay films on faces of peds; common fine and medium roots; medium acid; gradual smooth boundary.

B22t—19 to 26 inches; yellowish red (5YR 4/6) silty clay; strong fine and medium subangular and angular blocky structure; firm, plastic and sticky; thin continuous clay films on faces of peds; common fine and medium roots; strongly acid; gradual smooth boundary.

B23t—26 to 34 inches; reddish brown (5YR 4/4) silty clay; moderate medium and fine subangular blocky structure; firm, plastic and sticky; thin discontinuous clay films on faces of peds; patchy light brownish gray coatings on faces of peds; few fine roots; strongly acid; clear smooth boundary.

C1—34 to 40 inches; approximately 60 percent red (2.5YR 4/6) clay loam and 40 percent grayish brown (10YR 5/2) loam and soft partially weathered shaly material; weak platy structure parting to weak medium subangular blocky; friable; thin patchy clay films on vertical and some horizontal faces; strongly acid; clear wavy boundary.

C2—40 to 65 inches, stratified layers of light brownish gray (10YR 6/2) partially weathered shale and brownish yellow (10YR 6/6) and dark yellowish brown (10YR 3/4) loam; weak platy structure; firm; strongly acid.

The reaction of the A horizon ranges from strongly acid to slightly acid. The B and C horizons range from strongly acid to medium acid.

The A horizon is brown, dark brown, yellowish brown, or dark yellowish brown. The B2t horizon is yellowish red or reddish brown. The lower part of the B horizon is mottled in shades of brown and gray. Texture is clay, silty clay, clay loam, or silty clay loam. Clay content ranges from 35 to 55 percent in the upper 20 inches. The C1 horizon has colors similar to those of the Bt horizon, or it is mottled in shades of red, gray, or yellow. Texture is clay loam, silty clay loam, loam, or sandy clay loam. In some pedons up to 50 percent of the C1 horizon is soft shale with platelike rock structure. The C2 horizon is shaded in red, gray, and yellow. The C2 horizon is stratified partially weathered shale and fine sandy loam or loam.

Oaklimeter series

The Oaklimeter series consists of moderately well drained, nearly level soils that formed in silty alluvium on broad flood plains. Slopes range from 0 to 2 percent.

Oaklimeter soils are associated with Bruno, Chenneby, and Gillsburg soils. Oaklimeter soils have more silt in the 10- to 40-inch section than Bruno soils and are not as well drained. Oaklimeter soils are better drained and have less clay in the 10- to 40-inch section than Chenneby soils. Oaklimeter soils are better drained than Gillsburg soils and are not as gray in the upper 20 inches.

Typical pedon of Oaklimeter silt loam, occasionally flooded; 3 miles southwest of Taylor, 1/2 mile south of State Highway 328; NE1/4NE1/4 sec. 3, T. 10 S., R. 4 W.

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

B21—7 to 23 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct pale brown (10YR 6/3) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; patchy dark brown stains on faces of peds; common fine vesicular pores; very strongly acid; gradual smooth boundary.

B22—23 to 50 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 6/2), dark yellowish brown (10YR 4/6), and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable, slightly brittle; common fine vesicular pores; very strongly acid; gradual smooth boundary.

A2b&B23b—50 to 65 inches; mottled pale brown (10YR 6/3), light brownish gray (10YR 6/2), yellowish brown (10YR 5/6), and dark yellowish brown (10YR 4/6) silt loam; weak coarse prismatic structure parting to weak medium subangular blocky; friable; few fine vesicular pores; very strongly acid.

The reaction is very strongly acid or strongly acid throughout except where the surface horizon has been limed. The clay content of the 10- to 40-inch control section ranges from 7 to 18 percent.

The Ap horizon is brown, yellowish brown, or dark yellowish brown. The B21 horizon is brown, dark yellowish brown, or yellowish brown. Grayish mottles range from none to common in the horizon. The B22 horizon is yellowish brown or dark yellowish brown with grayish mottles or is mottled in shades of gray and brown. The A2b&B23b horizon is gray, light gray, light brownish gray, or grayish brown or is mottled in shades of brown and gray.

Ochlockonee series

The Ochlockonee series consists of well drained, nearly level soils that formed in stratified loamy alluvial material on flood plains. Slopes range from 0 to 2 percent.

Ochlockonee soils are associated with Bruno, Jena, and Kirkville soils. Ochlockonee soils are not as sandy as Bruno soils. They are stratified and are not as well developed as Jena and Kirkville soils. They are better drained than Kirkville soils.

Typical pedon of Ochlockonee sandy loam, occasionally flooded; 6 miles southwest of Oxford, 1,000 feet west of gravel road on field road, 50 feet north of fence; SW1/4SW1/4 sec. 33, T. 8 S., R. 4 W.

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

C1—6 to 9 inches; dark yellowish brown (10YR 4/6) fine sandy loam; common medium faint yellowish brown (10YR 5/4) mottles; massive; very friable; thin horizontal bedding planes; common fine mica flakes; very strongly acid; clear smooth boundary.

C2—9 to 19 inches; dark yellowish brown (10YR 4/6) sandy loam; massive; very friable; thin horizontal bedding planes; thin strata of silt loam; few fine mica flakes; strongly acid; gradual smooth boundary.

C3—19 to 24 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint yellowish brown mottles; massive; very friable; thin horizontal bedding planes; common fine mica flakes; very strongly acid; clear smooth boundary.

C4—24 to 29 inches, dark yellowish brown (10YR 4/6) silt loam; few medium faint yellowish brown mottles; massive; friable; thin horizontal bedding planes; few fine mica flakes; very strongly acid; gradual smooth boundary.

C5—29 to 53 inches; dark yellowish brown (10YR 4/6) silt loam; few fine faint yellowish brown mottles; massive; very friable; very strongly acid; clear smooth boundary.

Ab—53 to 60 inches; dark brown (10YR 4/3) silt loam; common medium faint dark grayish brown (10YR 4/2) mottles; weak fine granular structure; friable; strongly acid.

Reaction is very strongly acid or strongly acid throughout except where the A horizon has been limed. The 10- to 40-inch section is less than 18 percent clay and more than 15 percent fine and coarser sand.

The Ap horizon ranges from dark brown to dark yellowish brown. The C horizon ranges from dark brown to dark yellowish brown. The C horizon is stratified fine sandy loam, sandy loam, loam, or silt loam.

Providence series

The Providence series consists of moderately well drained, gently sloping to strongly sloping soils that have a fragipan. The soils formed in a thin mantle of silty material underlain by loamy material on uplands. Slopes range from 2 to 12 percent.

Providence soils are associated with Calloway, Grenada, Tippah, and Wilcox soils. Providence, Calloway, and Grenada soils have a fragipan but Tippah and Wilcox soils do not. Above the fragipan, Calloway soils have an A'2 horizon and Grenada soils have an A2 horizon. Providence soils are better drained and have more sand in the lower part than Calloway soils, have more sand and less silt in the lower part of the fragipan than Grenada soils, and have more sand and less clay in the IIB horizon than Tippah soils. Providence soils are fine-silty, whereas Wilcox soils are in a fine family.

Typical pedon of Providence silt loam, 2 to 5 percent slopes, eroded; approximately 4 miles northeast of Philadelphia church, 800 feet north of gravel road; SE1/4NW1/4 sec. 10, T. 7 S., R. 1 W.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

B21t—7 to 18 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; patchy black and dark brown stains on faces of peds; few fine roots; very strongly acid; gradual smooth boundary.

B22t—18 to 23 inches; yellowish brown (10YR 5/6) silt loam; many medium faint light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; few patchy black and dark brown stains on faces of peds; discontinuous silt coatings on faces of peds; very strongly acid; gradual smooth boundary.

Bx1—23 to 41 inches; yellowish brown (10YR 5/6) silt loam; common medium faint yellowish brown (10YR 5/4) and common medium distinct light gray (10YR 7/2) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle and compact in approximately 60 to 70 percent of the volume; gray seams around prisms; patchy clay films on faces of prisms and peds; common fine and medium voids and pores; few patchy black stains on faces of peds; few fine and medium black concretions; very strongly acid; gradual smooth boundary.

IIBx2—41 to 65 inches; yellowish brown (10YR 5/6) silt loam that is 15 percent sand; common medium faint brownish yellow (10YR 6/6) and light yellowish brown (10YR 6/4) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle and compact in approximately 60 percent of the volume; common fine voids and pores; strongly acid.

Reaction ranges from very strongly acid to medium acid throughout.

The A horizon is brown, dark brown, or yellowish brown. The Bt horizon is strong brown, yellowish brown, or yellowish red. Texture is silty clay loam or silt loam. Clay content ranges from 18 to 30 percent in the B2t horizon. The Bx horizon ranges from yellowish brown to yellowish red with mottles in shades of gray, brown, and red. The upper part of the Bx horizon is silty clay loam or silt loam that contains visible sand. Texture of the lower part is silt loam, loam, or sandy clay loam.

Smithdale series

The Smithdale series consists of well drained, strongly sloping to steep soils that formed in loamy material on sides of hills on uplands. Slopes range from 8 to 40 percent.

Smithdale soils are associated with Lexington, Loring, Lucy, and Maben soils and Udorthents. Smithdale soils have more sand in the upper 20 inches of the Bt horizon than Lexington soils. Smithdale soils are better drained than Loring soils, lack a fragipan, and do not have silty texture. Smithdale soils do not have as much sand in the upper 20 to 40 inches as Lucy soils. Smithdale soils contain more sand than Maben soils and less than 30 percent clay throughout the solum. They are not as eroded or gullied as Udorthents.

Typical pedon of Smithdale sandy loam, 15 to 35 percent slopes, eroded; 6 miles west of Oxford, 300 feet north of State Highway 6; SE1/4NE1/4 sec. 29, T. 8 S., R. 4 W.

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

B21t—5 to 22 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; discontinuous clay films on faces of peds; common fine and medium roots; very strongly acid; gradual smooth boundary.

B22t—22 to 41 inches; red (2.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; discontinuous clay films on faces of peds, sand grains bridged with clay; few small sandstone fragments; few small pockets of very pale brown sand; few fine and medium roots; very strongly acid; gradual smooth boundary.

B23t—41 to 62 inches; red (2.5YR 4/8) sandy loam; moderate medium subangular blocky structure; friable; sand grains bridged and coated with clay and oxides; few small pockets of uncoated sand grains; few fine mica flakes; very strongly acid; gradual smooth boundary.

B24t—62 to 80 inches; red (2.5YR 4/8) sandy loam; weak medium subangular blocky structure; very friable; sand grains bridged and coated with clay and oxides; pockets of uncoated sand grains; few fine mica flakes; very strongly acid.

The reaction is very strongly acid or strongly acid throughout except where the surface horizon has been limed.

The A horizon is dark grayish brown, dark brown, or brown. The Bt horizon is yellowish red or red. Texture is clay loam, sandy clay loam, loam, or sandy loam. Clay content of the upper 20 inches ranges from 18 to 30 percent. Few to many pockets of uncoated sand grains are in the lower part of the Bt horizon.

Tippah series

The Tippah series consists of moderately well drained, nearly level to strongly sloping soils that formed in a thin mantle of silty material underlain by clayey material on uplands. Slopes range from 2 to 12 percent.

Tippah soils are associated with Maben, Providence, and Wilcox soils. Tippah soils are not as well drained as Maben soils and have less clay in the upper 20 inches of the Bt horizon. Tippah soils have more clay and less sand in the IIB horizon than Providence soils and do not have a fragipan. Tippah soils are better drained and contain less clay in the upper 20 to 40 inches than Wilcox soils.

Typical pedon of Tippah silt loam, 5 to 8 percent slopes, eroded; 11 miles east of Oxford, 2 miles south of State Highway 6 on gravel road, 200 feet west of gravel road; NE1/4SW1/4 sec. 16, T. 9 S., R. 1 W.

Ap—0 to 5 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

B21t—5 to 17 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; discontinuous clay films on faces of peds; common fine and medium roots; very strongly acid; gradual smooth boundary.

B22t—17 to 29 inches; strong brown (7.5R 5/6) silty clay loam; common medium distinct pale brown (10YR 6/3) and few fine distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable, patchy clay films on faces of peds; common fine and medium roots; few patchy black stains and silt coatings on faces of peds; very strongly acid; gradual smooth boundary.

B23t—29 to 36 inches; strong brown (7.5YR 5/6) silty clay loam; many medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; few fine patchy black stains on faces of peds; few fine and medium roots; very strongly acid; clear smooth boundary.

IIB24t—36 to 47 inches; yellowish red (5YR 5/6) silty clay; common medium distinct light brownish gray (2.5Y 6/2) and light yellowish brown (2.5Y 6/4) mottles; moderate medium subangular blocky structure; firm, plastic; thin continuous clay films on faces of peds; few fine and very fine roots; strongly acid; clear smooth boundary.

IIB3t—47 to 65 inches; grayish brown (2.5Y 5/2) clay; many medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; firm, plastic; patchy clay films on faces of peds; medium acid.

The reaction ranges from very strongly acid to medium acid throughout. Clay content of the upper 20 inches of the Bt horizon ranges from 20 to 35 percent.

The A horizon is dark grayish brown, grayish brown, dark yellowish brown, or yellowish brown. The B21t horizon is strong brown, yellowish red, or reddish brown. Texture is silt loam or silty clay loam. The B22t and B23t horizons are strong brown, yellowish red, or reddish brown with a few to many gray and brown mottles. Texture is silt loam or silty clay loam. The IIBt horizon is red to gray, or the horizon is mottled yellow, brown, red, or gray. Texture is silty clay loam, clay loam, silty clay, clay, or sandy clay.

Udorthents

The Udorthents great group of soils is in areas exposed by accelerated recent erosion. These soils are so affected by sheet and gully erosion that in most places the surface layer and upper part of the subsoil are washed away. Udorthents consist of the remaining subsoil and the regolith, or mantle of loose soil material, of bedrock on the Coastal Plain. The areas are dissected by gullies that form an intricate dendritic, or irregularly branched, pattern. Texture is variable, but it is predominantly loam, clay loam, or sandy clay loam in shades of red and yellow. In places a thin, dark, grayish A1 horizon forms beneath the organic surface mat and is stabilized by vegetation. Included are areas of exposed gully bottoms and gully walls. Gullies are 3 to 30 feet deep. The bottoms of the gullies range from nearly level to V-shaped, and many of the sides are nearly vertical. The soil material of the gully floors is stratified layers that vary widely in thickness, texture, and arrangement within short distances. Erosion and sedimentation are still active.

Udorthents are mostly associated with Smithdale soils.

Wilcox series

The Wilcox series consists of somewhat poorly drained, strongly sloping to steep soils that formed in clayey shale deposits on uplands. Slopes range from 8 to 25 percent.

Wilcox soils are associated with Maben, Providence, and Tippah soils. Wilcox soils are grayer than Maben soils and not as well drained. They are grayer than Providence soils and have more clay throughout the solum. Also, Providence soils have a fragipan. Wilcox soils have more clay throughout the solum than Tippah soils.

Typical pedon of Wilcox silt loam, 12 to 25 percent slopes, eroded; 3 miles west of Lafayette Springs church, 500 feet north of gravel road on woods road, 250 feet east of woods road; SE1/4NW1/4 sec. 3, T. 9 S., R. 1 W.

Ap—0 to 5 inches; yellowish brown (10YR 5/4) silt loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

B21t—5 to 12 inches; reddish brown (2.5YR 4/4) clay; common medium faint yellowish red (5YR 4/6) and common medium distinct light brownish gray (2.5Y 6/2) mottles; moderate fine and medium subangular blocky structure; firm, plastic and sticky; continuous clay films on faces of peds; common fine and medium roots; very strongly acid; gradual smooth boundary.

B22t—12 to 20 inches; yellowish red (5YR 4/6) clay; many fine and medium distinct light brownish gray (2.5Y 6/2) and many fine and medium faint reddish brown (5YR 5/4) mottles; moderate medium subangular blocky structure; firm, plastic and sticky; discontinuous clay films on faces of peds; common fine and medium roots; very strongly acid; gradual smooth boundary.

B23t—20 to 36 inches; mottled yellowish red (5YR 5/6), red (2.5YR 4/6), and light brownish gray (2.5Y 6/2) clay; moderate medium subangular blocky structure; firm, plastic and sticky; patchy clay films on faces of peds; few slickensides that do not intersect in lower part; few fine and medium roots; very strongly acid; gradual smooth boundary.

B3—36 to 54 inches; mottled brownish yellow (10YR 6/6), light brownish gray (2.5Y 6/2), yellowish red (5YR 5/6), and yellowish brown (10YR 5/8) clay; weak medium subangular blocky structure; firm, plastic and sticky; slickensides that do not intersect; few fine roots; very strongly acid; gradual smooth boundary.

C—54 to 65 inches; gray (10YR 6/1) soft weathered shale with yellowish brown stains on faces of lamellae; massive; firm plastic and sticky clay when crushed and rubbed; few to common hard fragments of shale that break with difficulty; shale becomes less weathered with increasing depth; very strongly acid.

The reaction ranges from extremely acid to strongly acid throughout. Depth to soft shale ranges from 40 to 60 inches.

The A horizon is dark grayish brown, dark brown, or yellowish brown. The B21t, B22t, and B23t horizons are dark brown, reddish brown, yellowish red, or strong brown and contain few to many gray mottles, or the horizons are mottled in shades of brown, red, and gray. In some pedons the lower part of the B horizon is gray. Texture is clay loam, silty clay, or clay. The upper 20 inches of the Bt horizon is 38 to 60 percent clay. The B3 and C horizons are gray or light brownish gray or are mottled gray, brown, and red. Texture is clay loam, silty clay, or clay and partially weathered shale. The lower part of the C horizon is soft shale that can be cut by a spade.

formation of the soils

Soil is a function of climate, living organisms, parent material, relief, and time. The nature of the soil at any point on the landscape depends on the combination of these five major factors at that point. All five of these factors take part in the formation of every soil, with the relative importance of each differing from place to place. In extreme cases one factor may dominate the formation of the soil and fix most of its properties, as is common when the parent material consists of almost pure sand. Little can happen to sand-sized quartz, and the soils derived from it have only faint horizons. For every soil the past combination of the five factors and their interaction have determined its present character.

climate

The humid warm-temperate climate of Lafayette County is characteristic of the southeastern part of the United States. This type of climate, like any other, is a genetic factor that affects the physical, chemical, and biological relationships in soils, primarily through precipitation and temperature.

The internal environment of the soil has been responsible for the present character of many of the soils. Environmental differences are largely due to presence or absence of a water table and its depth and duration. Soils that do not have a water table within the solum are browner in color: for example, the well drained Cascilla, Smithdale, or Lexington soils. Soils that have a seasonal high water table have gray colors with yellowish or brownish mottles: these are somewhat poorly drained soils, such as the Gillsburg and Arkabutla soils.

Inundated soils are grayish because they have insufficient oxygen and anaerobic decomposition of organic matter has taken place. Acids and other materials from decomposed organic matter reduce the iron and manganese oxides on soil particles. The soils become grayish, and the oxides become more soluble. Since the free water is not percolating through the soil, the reduced iron is not all removed; some is reoxidized, and mottling occurs when the soil dries. Soils that contain no oxidized iron and manganese are gray. The red, yellow, or brown streaks or spots are coatings of well oxidized iron or manganese on the soil particles. The amount of water that percolates through the soil depends mainly on rainfall, relative humidity, and the length of the frost-free period. Downward percolation is also affected by physiographic position and by soil permeability.

Temperature and precipitation influence the kind and growth of organisms in and on the soil. They also affect the speed of physical and chemical reactions. These reactions are influenced by the warm, moist weather that prevails most of the year. Because precipitation is plentiful in the county, the soils are subject to leaching and erosion.

living organisms

Plant and animal life in and on the soil have helped to change the parent material and have influenced the present character of the soil. Among the changes caused by living organisms are gains in organic matter and nutrients and changes in structure and porosity of the soil.

Plants add organic matter and nitrogen to the soil. Some plants can take nitrogen from the atmosphere and, through decay of the plant residue, add it to the soil. Soil pH is influenced by the plant residue. Products of plant decomposition are an active force in the oxidation-reduction processes, which alter the iron and manganese minerals in the soil parent material. Bulk density of the soil has been shown to be changed rapidly by developing vegetation. The darkening and development of an A horizon by organic matter is one of the earliest indications of horizon development in very young sediment.

Animals in the soil convert raw plant residue into humus and mix the humus with the mineral portion of the soil. Animals also carry the humus deep into the soil as they retreat downward along with the moisture during dry weather. Their tunneling moves mineral material from one horizon of the soil to another. It also helps to break down and destroy the original structure of the sediment. Tunnels left by animals also facilitate the movement of water through the soils. Animal life most noticeable in the soil of the county include earthworms and such large insects as beetles and grub. Crustacea, such as crayfish, are common in many poorly drained soils.

Microscopic animals make up a large population of the soil microflora. They aid in decomposition of plant residue and its conversion to humus. Bacteria also aid in conversion of atmospheric nitrogen to the soil.

With the development of agriculture and clearing of the native vegetation, man influences the formation of soils. By draining swamps, controlling floods, irrigating, introducing new crops, and using lime and other chemicals, man changes the direction of soil formation. The results of these activities on most mineral soils probably will not be evident for many centuries.

parent material

The parent materials of soils in Lafayette County were transported by three different sources of energy. These are wind, sea, and streams.

The character of the parent material controls the texture and mineralogy of most of the soils that formed in it. Soil drainage and soil color are also influenced by it. Where the deposited sediments are loamy in texture, the soils that develop are also loamy. Clayey sediments high in montmorillonite develop into clayey soils with montmorillonitic mineralogy. Some changes occur in the texture of the raw material during soil development, but the texture of the developed soil is controlled by the parent material. In parent materials that have thin strata of contrasting texture, the processes of soil development mix the contrasting strata so that the developed soil has a more uniform texture than the parent material. The texture of the developed soil, however, remains within the limits of the texture of the parent material.

Loess is a parent material deposited by wind. Many soil scientists think of loess as mainly glacial drift that was carried southward and deposited on broad flood plains by the streams formed by melting glaciers. Later this material was redeposited by wind on older marine sediments.

Where loess is unweathered, it is uniform in physical and chemical composition and is silty, though soil particles are irregular in shape. Loess deposits vary in depth. Loring and Grenada soils formed in loess parent material. Where the loess is thin, the upper soil horizons formed in weathered loess and the lower soil horizons formed in acid marine sediment. Lexington, Providence, and Tippah soils formed in such materials.

The parent material in the steeper areas of the county are of marine origin. They are loamy and clayey. The soil particles are mixtures of sand, silt, and clay and are generally rounded in shape. The Smithdale soils formed in sandy or loamy marine sediment and the Maben and Wilcox soils formed in clayey sediment.

The soils on the flood plains formed in alluvium deposited by streams. They are dominantly silty, but are mixed with sand and clay in some areas. Oaklimeter and Gillsburg soils formed in the dominantly silty alluvium. Arkabutla, Chenneby, and Cascilla soils formed in silty material that has a higher percentage of clay. Bruno, Jena, Kirkville, and Ochlockonee soils formed in the sandier alluvium.

relief

Relief affects soil formation through its influence on soil drainage, erosion, plant cover, and soil temperature. For the most part, elevation in Lafayette County ranges from 400 to 600 feet. In a few places the flood plains and nearby ridges have differences in elevation of only about 20 feet within a square mile, but local differences of 40 to 80 feet are common in other areas.

The steep slopes in the uplands cause rapid runoff from many soils. Thus, relief influences the amount of moisture in soils and the erosion that occurs on the surface. The amount of water that moves through the soil during formation depends partly on the relief.

Fragipan formation is associated with relief and drainage. These compact, brittle horizons are most strongly expressed on level to gently sloping topography. Fragipans govern the depth to which roots, air, and water can penetrate in the soil, as well as permeability and wetness.

The flatness of the flood plains has much to do with the slow drainage of some of these soils. Water moves into main channels with difficulty, especially from depressions and level areas. In these areas the soils are likely to be grayish and wet. Erosion is very slight in nearly level areas on flood plains.

Because much more vegetation grows on nearly level soils than on steep soils, nearly level soils are supplied with more organic matter. Organic matter helps to increase the infiltration, permeability, and water-holding capacity of the soils. Relief often determines the use of the soil as well as its productivity.

time

A long time is generally required for the formation of soils that have distinct horizons. The length of time that the parent material has been in place is commonly reflected in the degree to which the soil profile has developed.

The geological age of soils in Lafayette County ranges from young to old. The young soils have undergone very little profile development, and the older soils have well defined horizons.

Soils on the flood plains are young, and some of them still occasionally receive deposits. Among the youngest soils on the flood plains are Bruno, Gillsburg, and Ochlockonee soils. In these soils, horizon differentiation is slight. Except for the darkening of the surface layer, these soils have retained most of the characteristics of their parent material. Cascilla, Chenneby, and Jena soils are among the older soils on the flood plains. They have weakly defined horizons but retain many of the characteristics of the parent material.

The upland soils are generally much older than the flood plain soils. Lexington, Smithdale, and Tippah soils are examples of the older upland soils. These soils have profiles with well defined horizons that bear little resemblance to the original parent material. Through time, however, soil profiles, especially of steep soils, may be altered by geologic erosion.

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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.

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 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

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 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

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.

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.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

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.

Forb. Any herbaceous plant not a grass or a sedge.

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.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

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 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an 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.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. 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 Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand and loamy sand.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

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.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of 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.

Narrow-base terrace. A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

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 affecting the specified use.

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

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.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. 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 outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The 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.

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.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

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). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

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 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 which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

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 content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

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.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-73 at University, Miss.]

Month	Temperature: Average daily maximum	Temperature: Average daily minimum	Temperature: Average daily	Temperature: 2 years in 10 will have-- Maximum temperature higher than--	Temperature: 2 years in 10 will have-- Minimum temperature lower than--	Temperature: Average number of growing degree days[1]	Precipitation: Average	Precipitation: 2 years in 10 will have-- Less than--	Precipitation: 2 years in 10 will have-- More than--	Precipitation: Average number of days with 0.10 inch or more	Precipitation: Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	50.9	30.2	40.5	75	5	34	4.90	2.29	7.02	7	1.9
February---	55.0	32.8	43.9	77	8	82	5.19	2.74	7.18	7	.9
March------	62.3	39.8	51.1	83	18	177	5.75	2.83	8.12	8	.6
April------	73.7	50.6	62.2	88	28	370	6.00	3.44	8.08	7	.0
May--------	80.8	57.5	69.2	92	38	595	4.84	3.00	6.49	6	.0
June-------	87.9	65.4	76.7	98	49	801	3.39	1.21	5.12	5	.0
July-------	90.9	68.5	79.7	100	54	921	3.97	1.68	5.83	6	.0
August-----	90.6	66.9	78.8	99	53	893	2.93	1.32	4.23	5	.0
September--	85.4	61.6	73.5	96	40	705	3.88	1.34	5.90	5	.0
October----	75.3	49.0	62.2	90	29	388	2.71	.98	4.12	4	.0
November---	62.9	39.1	51.0	83	16	99	5.05	2.34	7.26	6	.0
December---	54.0	33.0	43.5	76	8	61	5.19	2.79	7.15	7	.8
Yearly:											
Average--	72.5	49.5	61.0	---	---	---	---	---	---	---	---
Extreme--	---	---	---	101	1	---	---	---	---	---	---
Total----	---	---	---	---	---	5,126	53.80	45.40	61.85	73	4.2

[1]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

[Recorded in the period 1951-73 at University, Miss.]

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--	April 1	April 9	April 19
2 years in 10 later than--	March 24	April 4	April 14
5 years in 10 later than--	March 10	March 24	April 4
First freezing temperature in fall:			
1 year in 10 earlier than--	November 2	October 24	October 10
2 years in 10 earlier than--	November 7	October 28	October 15
5 years in 10 earlier than--	November 16	November 6	October 25

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-73 at University, Miss.]

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	225	209	180
8 years in 10	233	215	188
5 years in 10	250	226	203
2 years in 10	267	237	218
1 year in 10	276	242	226

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
51	Arkabutla silt loam, occasionally flooded	11,035	2.7
18	Arkabutla-Chenneby association, frequently flooded	11,440	2.8
6A	Calloway silt loam, 0 to 1 percent slopes	1,155	0.3
16	Cascilla silt loam, occasionally flooded	5,065	1.2
10	Chenneby silt loam, occasionally flooded	22,645	5.5
12	Gillsburg silt loam, occasionally flooded	1,840	0.5
6B	Grenada silt loam, 1 to 3 percent slopes	2,840	0.7
20	Grenada-Calloway association, frequently flooded	1,355	0.3
11	Jena fine sandy loam, occasionally flooded	1,475	0.4
13	Kirkville fine sandy loam, occasionally flooded	2,580	0.6
3B	Lexington silt loam, 2 to 5 percent slopes, eroded	10,905	2.7
3C	Lexington silt loam, 5 to 8 percent slopes, eroded	10,895	2.7
3C3	Lexington silt loam, 5 to 8 percent slopes, severely eroded	935	0.2
3D3	Lexington silt loam, 8 to 15 percent slopes, severely eroded	8,615	2.1
4B	Loring silt loam, 2 to 5 percent slopes, eroded	3,720	0.9
4C	Loring silt loam, 5 to 8 percent slopes, eroded	3,100	0.8
50	Maben fine sandy loam, 12 to 25 percent slopes	5,270	1.3
38	Maben-Smithdale-Tippah association, hilly	67,895	16.6
14	Oaklimeter silt loam, occasionally flooded	3,785	0.9
9	Ochlockonee sandy loam, occasionally flooded	11,580	2.8
41	Ochlockonee-Bruno complex, frequently flooded	515	0.1
40	Ochlockonee-Bruno association, frequently flooded	3,840	0.9
Pt	Pits	95	*
2B	Providence silt loam, 2 to 5 percent slopes, eroded	4,560	1.1
2C	Providence silt loam, 5 to 8 percent slopes, eroded	5,690	1.4
2C3	Providence silt loam, 5 to 8 percent slopes, severely eroded	560	0.1
2D3	Providence silt loam, 8 to 12 percent slopes, severely eroded	3,270	0.8
7F	Smithdale sandy loam, 15 to 35 percent slopes, eroded	40,455	9.9
7	Smithdale-Udorthents complex, gullied	14,995	3.7
70	Smithdale-Lucy association, hilly	94,855	23.2
71	Smithdale-Udorthents association, gullied	22,665	5.5
5B	Tippah silt loam, 2 to 5 percent slopes, eroded	810	0.2
5C	Tippah silt loam, 5 to 8 percent slopes, eroded	2,885	0.7
5D	Tippah silt loam, 8 to 12 percent slopes, eroded	1,235	0.3
8E	Wilcox silt loam, 12 to 25 percent slopes, eroded	2,295	0.6
44	Wilcox-Tippah association, hilly	5,705	1.4
	Water	16,600	4.1
	Total	409,160	100.0

* Less than 0.1 percent.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Cotton lint	Corn	Soybeans	Common bermudagrass	Improved bermudagrass	Tall fescue
	Lb	Bu	Bu	AUM*	AUM*	AUM*
51------------------------ Arkabutla	700	95	35	7.0	11.0	10.0
18:**						
Arkabutla----------------	---	---	---	6.0	8.0	---
Chenneby-----------------	---	---	---	6.0	8.0	---
6A------------------------ Calloway	650	85	35	6.0	9.0	8.0
16------------------------ Cascilla	850	110	40	9.0	12.0	10.5
10------------------------ Chenneby	700	100	35	7.0	10.0	10.0
12------------------------ Gillsburg	650	90	35	7.0	10.0	9.0
6B------------------------ Grenada	600	80	35	6.0	9.5	8.0
20:**						
Grenada------------------	---	---	---	---	---	---
Calloway-----------------	---	---	---	---	---	---
11------------------------ Jena	750	85	35	7.0	11.0	10.0
13------------------------ Kirkville	700	95	40	8.0	11.0	10.5
3B------------------------ Lexington	700	90	35	7.5	10.0	9.0
3C------------------------ Lexington	650	70	30	7.0	9.0	8.0
3C3----------------------- Lexington	400	60	20	6.5	8.5	---
3D3----------------------- Lexington	---	---	---	4.5	6.5	---
4B------------------------ Loring	700	90	30	7.5	10.0	8.5
4C------------------------ Loring	650	70	25	6.5	9.0	7.5
50------------------------ Maben	---	---	---	---	---	---
38:**						
Maben--------------------	---	---	---	---	---	---
Smithdale----------------	---	---	---	---	---	---
Tippah-------------------	---	---	---	6.0	8.5	7.0
14------------------------ Oaklimeter	750	95	40	9.0	11.0	10.0

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Cotton lint	Corn	Soybeans	Common bermudagrass	Improved bermudagrass	Tall fescue
	Lb	Bu	Bu	AUM*	AUM*	AUM*
9 Ochlockonee	750	110	40	7.0	8.0	10.0
41 Ochlockonee-Bruno	---	---	---	---	---	---
40:**						
Ochlockonee	---	---	---	---	---	---
Bruno	---	---	---	---	---	---
Pt** Pits	---	---	---	---	---	---
2B Providence	700	80	35	6.5	9.5	8.5
2C Providence	650	70	30	6.0	9.0	7.5
2C3 Providence	500	55	25	5.5	8.5	---
2D3 Providence	---	---	---	5.5	8.5	---
7F Smithdale	---	---	---	---	---	---
7 Smithdale-Udorthents	---	---	---	---	---	---
70:**						
Smithdale	---	---	---	---	---	---
Lucy	---	---	---	---	---	---
71:**						
Smithdale	---	---	---	---	---	---
Udorthents.						
5B Tippah	650	80	35	7.0	10.0	8.5
5C Tippah	600	70	30	6.0	9.0	7.5
5D Tippah	500	60	25	6.0	8.5	7.0
8E Wilcox	---	---	---	4.5	6.0	5.0
44:**						
Wilcox	---	---	---	4.5	6.0	5.0
Tippah	---	---	---	6.0	8.5	7.0

* 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.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	---	---	---	---	---
II	82,520	22,835	61,160	---	---
III	22,570	22,570	---	---	---
IV	31,437	27,177	13,412	---	---
V	1,447	---	1,447	---	---
VI	44,659	8,615	---	36,044	---
VII	197,915	197,915	---	---	---
VIII	---	---	---	---	---

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	Woodland suitability group	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
51------------------ Arkabutla	1w8	Slight	Moderate	Slight	Moderate	Cherrybark oak------	105	Cherrybark oak, eastern cottonwood, green ash, loblolly pine, sweetgum, American sycamore.
						Eastern cottonwood--	110	
						Green ash-----------	95	
						Loblolly pine-------	100	
						Nuttall oak---------	110	
						Sweetgum------------	100	
						Water oak-----------	100	
						Willow oak----------	100	
18:*								
Arkabutla and Chenneby-----------	1w9	Slight	Moderate	Moderate	Severe	Loblolly pine-------	100	Loblolly pine, yellow-poplar, sweetgum, water oak, American sycamore.
						Sweetgum------------	100	
						Water oak-----------	100	
						Yellow-poplar-------	110	
						American sycamore---	110	
6A------------------ Calloway	2w8	Slight	Moderate	Slight	Moderate	Cherrybark oak------	90	Cherrybark oak, Shumard oak, sweetgum, water oak, yellow-poplar.
						Loblolly pine-------	90	
						Shortleaf pine------	80	
						Sweetgum------------	90	
						Water oak-----------	90	
16------------------ Cascilla	1o7	Slight	Slight	Slight	Moderate	Cherrybark oak------	112	Cherrybark oak, eastern cottonwood, loblolly pine, Nuttall oak, sweetgum, American sycamore, yellow-poplar.
						Eastern cottonwood--	110	
						Loblolly pine-------	93	
						Nuttall oak---------	114	
						Water oak-----------	104	
						Sweetgum------------	102	
						Yellow-poplar-------	115	
10------------------ Chenneby	1w8	Slight	Moderate	Moderate	Severe	Loblolly pine-------	100	Loblolly pine, yellow-poplar, sweetgum, water oak, American sycamore.
						Sweetgum------------	100	
						Water oak-----------	100	
						Yellow-poplar-------	110	
						American sycamore---	110	
12------------------ Gillsburg	2w8	Slight	Moderate	Moderate	Moderate	Cherrybark oak------	100	Eastern cottonwood, loblolly pine, sweetgum, American sycamore, yellow-poplar.
						Eastern cottonwood--	105	
						Green ash-----------	85	
						Loblolly pine-------	90	
						Sweetgum------------	90	
						American sycamore---	105	
						Water oak-----------	95	
						Yellow-poplar-------	105	
6B------------------ Grenada	3o7	Slight	Slight	Slight	Slight	Cherrybark oak------	85	Cherrybark oak, Shumard oak, water oak, loblolly pine, white oak, shortleaf pine, slash pine, sweetgum.
						Southern red oak----	80	
						Loblolly pine-------	85	
						Shortleaf pine------	75	
						Sweetgum------------	80	
11------------------ Jena	1o7	Slight	Slight	Slight	Moderate	Loblolly pine-------	100	Loblolly pine, slash pine, American sycamore, eastern cottonwood.
						Sweetgum------------	90	
						Water oak-----------	80	
						Southern red oak----	---	
						White oak-----------	---	
						Slash pine----------	---	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Wood- land suita- bility group	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Plant competi- tion	Common trees	Site index	
13----------------- Kirkville	1w8	Slight	Moderate	Moderate	Moderate	Cherrybark oak------ Loblolly pine------- Sweetgum----------- Water oak-----------	100 95 100 100	Cherrybark oak, eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
3B, 3C, 3C3, 3D3--- Lexington	3o7	Slight	Slight	Slight	Moderate	Cherrybark oak------ Southern red oak---- Loblolly pine------- Shortleaf pine------ Sweetgum----------- Shagbark hickory---- Yellow-poplar------- Black walnut-------- Black cherry--------	80 70 80 70 89 --- 90 --- ---	Cherrybark oak, Shumard oak, loblolly pine, yellow-poplar, sweetgum.
4B, 4C------------- Loring	3o7	Slight	Slight	Slight	Severe	Cherrybark oak------ Sweetgum----------- Southern red oak---- Loblolly pine------- Water oak-----------	86 90 74 85 82	Loblolly pine, yellow-poplar, southern red oak.
50----------------- Maben	3c2	Slight	Moderate	Moderate	Slight	Loblolly pine------- Shortleaf pine------	83 73	Loblolly pine, shortleaf pine.
38:*								
Maben-------------	3c2	Slight	Moderate	Moderate	Slight	Loblolly pine------- Shortleaf pine------	83 73	Loblolly pine, shortleaf pine.
Smithdale---------	3o1	Slight	Slight	Slight	Moderate	Loblolly pine------- Shortleaf pine------	80 69	Loblolly pine.
Tippah------------	3o7	Slight	Slight	Slight	Moderate	Cherrybark oak------ Shumard oak--------- White oak----------- Loblolly pine------- Sweetgum----------- Yellow-poplar-------	95 95 80 78 90 90	Cherrybark oak, Shumard oak, loblolly pine, sweetgum, yellow-poplar.
14----------------- Oaklimeter	1o7	--------	--------	--------	--------	Cherrybark oak------ Eastern cottonwood-- Green ash----------- Loblolly pine------- Nuttall oak--------- Willow oak---------- Sweetgum-----------	100 100 90 90 100 100 100	Cherrybark oak, eastern cottonwood, loblolly pine, Nuttall oak, sweetgum, water oak, yellow-poplar.
9------------------ Ochlockonee	1o7	Slight	Slight	Slight	Moderate	Eastern cottonwood-- Loblolly pine------- Yellow-poplar------- Slash pine---------- Sweetgum----------- Water oak-----------	100 100 110 100 90 80	Loblolly pine, yellow-poplar, eastern cottonwood.
41,* 40:*								
Ochlockonee-------	1w7	Slight	Moderate	Slight	Moderate			
Bruno-------------	2s8	Slight	Moderate	Moderate	Moderate	Cherrybark oak------ Water oak----------- Sweetgum----------- Willow oak---------- River birch---------	116 105 110 88 ---	Cherrybark oak, Shumard oak, chestnut oak, willow oak, sweetgum, yellow-poplar.
2B, 2C, 2C3, 2D3--- Providence	3o7	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Sweetgum-----------	84 64 90	Loblolly pine, Shumard oak, sweetgum, yellow-poplar.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Wood-land suita-bility group	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Plant competi-tion	Common trees	Site index	
7F------------------ Smithdale	3o1	Slight	Slight	Slight	Moderate	Loblolly pine------- Shortleaf pine------	80 69	Loblolly pine.
7:*								
Smithdale---------	3o1	Slight	Slight	Slight	Moderate	Loblolly pine------- Shortleaf pine------	80 69	Loblolly pine.
Udorthents.								
70:*								
Smithdale---------	3o1	Slight	Slight	Slight	Moderate	Loblolly pine------- Shortleaf pine------	80 69	Loblolly pine.
Lucy---------------	3s2	Moderate	Moderate	Severe	Moderate	Longleaf pine------- Loblolly pine-------	71 84	Longleaf pine, loblolly pine.
71:*								
Smithdale---------	3o1	Slight	Slight	Slight	Moderate	Loblolly pine------- Shortleaf pine------	80 69	Loblolly pine.
Udorthents.								
5B, 5C, 5D--------- Tippah	3o7	Slight	Slight	Slight	Moderate	Cherrybark oak------ Shumard oak--------- White oak----------- Loblolly pine------- Sweetgum------------ Yellow-poplar-------	95 95 80 78 90 90	Cherrybark oak, Shumard oak, loblolly pine, sweetgum, yellow-poplar.
8E------------------ Wilcox	3c2	Severe	Moderate	Moderate	Slight	Loblolly pine------- Shortleaf pine------ Slash pine----------	81 68 85	Loblolly pine.
44:*								
Wilcox------------	3c2	Severe	Moderate	Moderate	Slight	Loblolly pine------- Shortleaf pine------ Slash pine----------	81 68 85	Loblolly pine.
Tippah------------	3o7	Slight	Slight	Slight	Moderate	Cherrybark oak------ Shumard oak--------- White oak----------- Loblolly pine------- Sweetgum------------ Yellow-poplar-------	95 95 80 78 90 90	Cherrybark oak, Shumard oak, loblolly pine, sweetgum, yellow-poplar.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--ENVIRONMENTAL PLANTINGS

[Key to Chart: 1=Well suited; 2=Suited; 3=Poorly suited
Absence of an entry indicates the species does not grow well on the soil]

Map symbol and soil name	Trees (Expected height of 20 years of age): More than 50 ft.					30 to 50 ft.					15 to 30 ft.			Ornamental shrubs									
	Loblolly pine	Southern red oak	Water oak	Willow oak	Yellow-poplar	Black cherry	Pecan	Red maple	Red mulberry	Southern magnolia	American holly	Flowering dogwood	Common sassafras	Azalea	Camellia	Crapemyrtle	Hibiscus	Holly	Nandina	Pyrocantha	Redbud	Rhododendron	Rose
51----------------- Arkabutla	1	2	1	1	2	2	2	1	3	1	3	3	3	3	3	2	2	2	3	2	2	3	3
18:*																							
Arkabutla--------	1	2	1	1	2	2	2	1	3	1	3	3	3	-	-	-	-	-	-	-	-	-	-
Chenneby---------	1	3	1	1	1	2	1	1	2	1	1	1	2	-	-	-	-	-	-	-	-	-	-
6A----------------- Calloway	1	3	1	1	3	3	3	3	2	2	2	2	3	2	2	2	2	3	2	2	2	2	3
16----------------- Cascilla	1	2	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1
10----------------- Chenneby	1	3	1	1	1	2	1	1	2	1	1	1	2	3	3	2	1	2	2	2	2	3	2
12----------------- Gillsburg	1	3	1	1	1	2	2	1	2	1	1	1	2	3	3	2	1	2	2	2	2	3	2
6B----------------- Grenada	2	2	2	2	3	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	1	2
20:*																							
Grenada----------	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calloway---------	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11----------------- Jena	1	1	1	1	1	3	1	3	1	2	2	2	1	1	1	1	1	1	1	1	2	1	2
13----------------- Kirkville	1	1	1	1	1	3	1	2	3	1	2	2	1	2	2	1	1	1	2	2	2	1	1
3B, 3C, 3C3, 3D3-- Lexington	2	2	2	2	2	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1
4B, 4C------------ Loring	2	2	2	2	3	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1
50----------------- Maben	2	2	3	3	3	2	2	1	2	2	2	2	3	1	1	1	2	1	1	1	1	1	3
38:*																							
Maben------------	2	2	3	3	3	2	2	1	2	2	2	2	3	1	1	1	2	1	1	1	1	1	3
Smithdale--------	2	2	3	3	3	3	3	3	2	3	2	2	1	1	1	1	1	1	1	1	1	1	2
Tippah-----------	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2
14----------------- Oaklimeter	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	2	2	2	1	1
9------------------ Ochlockonee	1	1	1	1	1	1	1	1	2	3	2	2	1	1	1	1	1	1	1	1	2	2	2
41:*																							
Ochlockonee------	1	1	1	1	1	1	1	1	2	3	2	2	1	-	-	-	-	-	-	-	-	-	-
Bruno------------	3	2	1	1	1	3	2	3	2	3	2	2	1	-	-	-	-	-	-	-	-	-	-

See footnote at end of table.

TABLE 8.--ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees (Expected height of 20 years of age)													Ornamental shrubs									
	More than 50 ft.					30 to 50 ft.					15 to 30 ft.												
	Loblolly pine	Southern red oak	Water oak	Willow oak	Yellow-poplar	Black cherry	Pecan	Red maple	Red mulberry	Southern magnolia	American holly	Flowering dogwood	Common sassafras	Azalea	Camellia	Crapemyrtle	Hibiscus	Holly	Nandina	Pyrocantha	Redbud	Rhododendron	Rose
40:*																							
Ochlockonee	1	1	1	1	1	1	1	1	2	3	2	2	1	-	-	-	-	-	-	-	-	-	-
Bruno	3	2	1	1	1	3	2	3	2	3	2	2	1	-	-	-	-	-	-	-	-	-	-
Pt. Pits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2B, 2C, 2C3, 2D3. Providence	2	2	2	2	2	2	3	3	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1
7F. Smithdale	2	2	3	3	3	3	3	3	2	3	2	2	1	1	1	1	1	1	1	1	1	1	2
7:*																							
Smithdale	2	2	3	3	3	3	3	3	2	3	2	2	1	1	1	1	1	1	1	1	1	1	2
Udorthents	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70:*																							
Smithdale	2	2	3	3	3	3	3	3	2	3	2	2	1	1	1	1	1	1	1	1	1	1	2
Lucy	2	2	3	3	3	3	3	3	2	3	2	2	1	3	3	3	3	3	3	3	3	3	3
71:*																							
Smithdale	2	2	3	3	3	3	3	3	2	3	2	2	1	1	1	1	1	1	1	1	1	1	2
Udorthents	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5B, 5C, 5D. Tippah	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	1	2	2	2	2	2
8E. Wilcox	2	2	3	3	3	3	3	2	3	2	3	3	3	3	3	2	3	2	2	2	3	3	3
44:*																							
Wilcox	2	2	3	3	3	3	3	2	3	2	3	3	3	3	3	2	3	2	2	2	3	3	3
Tippah	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	1	2	2	2	2	2

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
51 Arkabutla	Severe: floods.	Moderate: wetness.	Moderate: wetness, floods.	Moderate: wetness.	Moderate: wetness, floods.
18:*					
Arkabutla	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: floods.
Chenneby	Severe: floods, wetness,	Moderate: floods, wetness.	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: floods.
6A Calloway	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
16 Cascilla	Severe: floods.	Slight	Moderate: floods.	Slight	Moderate: floods.
10 Chenneby	Severe: floods, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, floods.
12 Gillsburg	Severe: floods, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, floods.
6B Grenada	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
20:*					
Grenada	Severe: floods.	Moderate: floods, wetness, percs slowly.	Severe: floods.	Moderate: wetness, floods.	Severe: floods.
Calloway	Severe: floods, wetness.	Moderate: floods, wetness, percs slowly.	Severe: wetness, floods.	Moderate: wetness, floods.	Severe: floods.
11 Jena	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
13 Kirkville	Severe: floods.	Moderate: wetness.	Moderate: wetness, floods.	Moderate: wetness.	Moderate: wetness, floods.
3B Lexington	Slight	Slight	Moderate: slope.	Slight	Slight.
3C, 3C3 Lexington	Slight	Slight	Severe: slope.	Slight	Slight.
3D3 Lexington	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
4B Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
4C Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Slight.
50 Maben	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
38:*					
Maben	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Tippah	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
14 Oaklimeter	Severe: floods.	Moderate: wetness.	Moderate: wetness, floods.	Moderate: wetness.	Moderate: wetness, floods.
9 Ochlockonee	Severe: floods.	Slight	Moderate: floods.	Slight	Moderate: floods.
41,* 40:*					
Ochlockonee	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.	Severe: floods.
Bruno	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.	Severe: floods.
Pt.* Pits					
2B Providence	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Moderate: wetness.
2C, 2C3 Providence	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Moderate: wetness.
2D3 Providence	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
7F Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
7:*					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Udorthents.					

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
70:*					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lucy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
71:*					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Udorthents.					
5B Tippah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
5C Tippah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Slight.
5D Tippah	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
8E Wilcox	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
44:*					
Wilcox	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
Tippah	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
51 Arkabutla	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair
18:*											
Arkabutla	Poor	Fair	Fair	Good	Good	---	Fair	Fair	Fair	Good	Fair
Chenneby	Poor	Fair	Fair	Good	Good	---	Fair	Fair	Fair	Good	Fair
6A Calloway	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair
16 Cascilla	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
10 Chenneby	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair
12 Gillsburg	Fair	Good	Good	Good	---	---	Fair	Fair	Good	Good	Fair
6B Grenada	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
20:*											
Grenada	Poor	Fair	Fair	Very poor.	---	---	Fair	Fair	Poor	Poor	Fair
Calloway	Poor	Fair	Fair	Very poor.	---	---	Fair	Fair	Poor	Poor	Fair
11 Jena	Poor	Fair	Fair	Good	Good	---	Poor	Poor	Fair	Good	Poor
13 Kirkville	Good	Good	Good	Good	---	---	Poor	Poor	Good	Good	Poor
3B Lexington	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
3C, 3C3 Lexington	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
3D3 Lexington	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
4B Loring	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
4C Loring	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
50 Maben	Very poor.	Fair	Fair	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.
38:*											
Maben	Very poor.	Fair	Fair	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.
Smithdale	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
Tippah	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
14 Oaklimeter	Good	Good	Good	Good	Poor	---	Poor	Poor	Good	Good	Poor
9 Ochlockonee	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
41,* 40:*											
Ochlockonee	Poor	Fair	Fair	Good	Good	---	Poor	Very poor.	Fair	Good	Very poor.
Bruno	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Pt.* Pits											
2B Providence	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
2C, 2C3, 2D3 Providence	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
7F Smithdale	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
7:*											
Smithdale	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
Udorthents.											
70:*											
Smithdale	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
Lucy	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
71:*											
Smithdale	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
Udorthents.											
5B Tippah	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor
5C, 5D Tippah	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
8E Wilcox	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
44:*											
Wilcox	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
Tippah	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
51-----Arkabutla	Severe: wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: low strength, floods.	Moderate: wetness, floods.
18:*						
Arkabutla-----	Severe: wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: low strength, floods.	Severe: floods.
Chenneby-----	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, floods.	Severe: floods.
6A-----Calloway	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
16-----Cascilla	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: low strength, floods.	Moderate: floods.
10-----Chenneby	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, floods.	Moderate: wetness, floods.
12-----Gillsburg	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.	Moderate: wetness, floods.
6B-----Grenada	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
20:*						
Grenada-----	Severe: wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: low strength, floods.	Severe: floods.
Calloway-----	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, floods.	Severe: floods.
11-----Jena	Severe: cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
13-----Kirkville	Severe: wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.	Moderate: wetness, floods.
3B-----Lexington	Slight-----	Slight-----	Slight-----	Slight-----	Severe: low strength.	Slight.
3C, 3C3-----Lexington	Slight-----	Slight-----	Slight-----	Moderate: slope.	Severe: low strength.	Slight.
3D3-----Lexington	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
4B-----Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
4C-----Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 11.--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
50: Maben	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
38:*						
Maben	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Tippah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
14: Oaklimeter	Severe: wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.	Moderate: wetness, floods.
9: Ochlockonee	Moderate: wetness.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
41,* 40:*						
Ochlockonee	Moderate: wetness.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Bruno	Severe: cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Pt.* Pits						
2B: Providence	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
2C, 2C3: Providence	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Moderate: wetness.
2D3: Providence	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.
7F: Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
7:*						
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Udorthents.						
70:*						
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lucy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
71:*						
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Udorthents.						

See footnote at end of table.

TABLE 11.--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
5B----------------- Tippah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.
5C----------------- Tippah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Slight.
5D----------------- Tippah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
8E----------------- Wilcox	Severe: wetness, slope.	Severe: shrink-swell, slope.	Severe: wetness, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
44:*						
Wilcox-----------	Severe: wetness, slope.	Severe: shrink-swell, slope.	Severe: wetness, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
Tippah-----------	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
51 Arkabutla	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Fair: too clayey, wetness.
18:*					
Arkabutla	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Fair: too clayey, wetness.
Chenneby	Severe: floods, wetness.	Severe: seepage, floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, wetness.	Fair: wetness.
6A Calloway	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
16 Cascilla	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Good.
10 Chenneby	Severe: floods, wetness.	Severe: seepage, floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, wetness.	Fair: wetness.
12 Gillsburg	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
6B Grenada	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
20:*					
Grenada	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.	Good.
Calloway	Severe: floods, wetness, percs slowly.	Severe: floods.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
11 Jena	Severe: floods.	Severe: seepage, floods.	Severe: floods, seepage.	Severe: floods, seepage.	Fair: too sandy.
13 Kirkville	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Fair: wetness.
3B, 3C, 3C3 Lexington	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
3D3 Lexington	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.

See footnote at end of table.

TABLE 12.--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
4B, 4C: Loring	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
50: Maben	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
38:*					
Maben	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Tippah	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
14: Oaklimeter	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Fair: wetness.
9: Ochlockonee	Severe: floods, wetness.	Severe: seepage, floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Fair: wetness.
41,* 40:*					
Ochlockonee	Severe: floods, wetness.	Severe: seepage, floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Fair: wetness.
Bruno	Severe: floods, poor filter.	Severe: seepage, floods.	Severe: floods, seepage, wetness.	Severe: floods, seepage.	Poor: seepage, too sandy.
Pt.* Pits					
2B, 2C, 2C3: Providence	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
2D3: Providence	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
7F: Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
7:*					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Udorthents.					
70:*					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.

See footnote at end of table.

TABLE 12.--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
70:*					
Lucy	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage.	Poor: slope.
71:*					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Udorthents.					
5B, 5C Tippah	Severe: wetness, percs slowly.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
5D Tippah	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
8E Wilcox	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: depth to rock, wetness, slope.	Severe: slope.	Poor: too clayey, hard to pack, slope.
44:*					
Wilcox	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: depth to rock, wetness, slope.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Tippah	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
51-------------------- Arkabutla	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
18:*				
Arkabutla------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Chenneby------------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
6A-------------------- Calloway	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
16-------------------- Cascilla	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
10-------------------- Chenneby	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
12-------------------- Gillsburg	Fair: low strength, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
6B-------------------- Grenada	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
20:*				
Grenada--------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Calloway-------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
11-------------------- Jena	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
13-------------------- Kirkville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
3B, 3C, 3C3----------- Lexington	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
3D3------------------- Lexington	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
4B, 4C---------------- Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
50-------------------- Maben	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
38:*				
Maben----------------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
Smithdale------------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
38:*				
Tippah	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.
14 Oaklimeter	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
9 Ochlockonee	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
41,* 40:*				
Ochlockonee	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Bruno	Good	Probable	Improbable: too sandy.	Poor: thin layer.
Pt.* Pits				
2B, 2C, 2C3 Providence	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
2D3 Providence	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
7F Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
7:*				
Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Udorthents.				
70:*				
Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Lucy	Fair: slope.	Improbable: excess fines, thin layer.	Improbable: excess fines.	Poor: slope.
71:*				
Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Udorthents.				
5B, 5C Tippah	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
5D Tippah	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.
8E Wilcox	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
44:*				
Wilcox	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
44:*				
Tippah----------------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
51----------------- Arkabutla	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Floods---------	Erodes easily, wetness.	Erodes easily.
18:*						
Arkabutla---------	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Floods---------	Erodes easily, wetness.	Erodes easily.
Chenneby---------	Moderate: seepage.	Severe: piping, hard to pack, wetness.	Moderate: slow refill.	Floods---------	Wetness--------	Wetness.
6A----------------- Calloway	Moderate: seepage.	Severe: thin layer.	Severe: no water.	Percs slowly---	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
16----------------- Cascilla	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
10----------------- Chenneby	Moderate: seepage.	Severe: piping, hard to pack, wetness.	Moderate: slow refill.	Floods---------	Wetness--------	Wetness.
12----------------- Gillsburg	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Floods---------	Erodes easily, wetness.	Wetness, erodes easily.
6B----------------- Grenada	Moderate: seepage.	Severe: piping.	Severe: no water.	Percs slowly---	Erodes easily, wetness, percs slowly.	Erodes easily, rooting depth, percs slowly.
20:*						
Grenada----------	Slight---------	Severe: piping.	Severe: no water.	Percs slowly, floods.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
Calloway---------	Slight---------	Moderate: piping.	Severe: no water.	Percs slowly, floods.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
11----------------- Jena	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable------	Droughty.
13----------------- Kirkville	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Floods---------	Wetness--------	Favorable.
3B, 3C, 3C3------- Lexington	Severe: seepage.	Severe: thin layer.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
3D3---------------- Lexington	Severe: seepage.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
4B, 4C------------ Loring	Moderate: seepage.	Moderate: piping.	Severe: no water.	Slope----------	Erodes easily, wetness.	Erodes easily, rooting depth.
50----------------- Maben	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
38:*						
Maben------------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
38:*						
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
Tippah	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
14 Oaklimeter	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Floods	Erodes easily, wetness.	Erodes easily.
9 Ochlockonee	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Favorable	Favorable.
41,* 40:*						
Ochlockonee	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Favorable	Favorable.
Bruno	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Too sandy	Droughty.
Pt.* Pits						
2B, 2C, 2C3 Providence	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: no water.	Slope	Erodes easily, wetness.	Erodes easily, rooting depth.
2D3 Providence	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: no water.	Slope	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
7F Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
7:*						
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
Udorthents.						
70:*						
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
Lucy	Severe: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Too sandy, slope.	Slope, droughty.
71:*						
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
Udorthents.						
5B, 5C Tippah	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, percs slowly.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
5D----------------- Tippah	Slight---------	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
8E----------------- Wilcox	Moderate: depth to rock.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
44:*						
Wilcox-----------	Moderate: depth to rock.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
Tippah-----------	Slight---------	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
51----------------Arkabutla	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	85-100	60-95	25-35	7-15
	5-60	Silty clay loam, loam, silt loam.	CL	A-6, A-7	0	100	100	85-100	70-90	30-45	12-25
18:* Arkabutla--------	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	85-100	60-95	25-35	7-15
	5-60	Silty clay loam, loam, silt loam.	CL	A-6, A-7	0	100	100	85-100	70-90	30-45	12-25
Chenneby--------	0-65	Silt loam--------	CL, ML, MH, CH	A-4, A-6, A-7	0	100	95-100	90-100	75-95	30-55	8-20
6A----------------Calloway	0-21	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	25-35	5-15
	21-51	Silt loam, silty clay loam.	CL	A-6	0	100	100	100	90-95	30-40	12-20
	51-65	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	25-35	5-15
16----------------Cascilla	0-5	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	20-38	3-15
	5-65	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	75-100	20-39	5-15
10----------------Chenneby	0-65	Silt loam--------	CL, ML, MH, CH	A-4, A-6, A-7	0	100	95-100	90-100	75-95	30-55	8-20
12----------------Gillsburg	0-33	Silt loam--------	CL-ML, CL	A-4	0	100	100	100	95-100	20-28	5-10
	33-60	Silt loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	20-38	5-16
6B----------------Grenada	0-6	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	90-100	<30	NP-6
	6-21	Silt loam, silty clay loam.	CL	A-6, A-4	0	100	100	95-100	90-100	27-40	8-19
	21-24	Silt loam--------	CL-ML, CL	A-4	0	100	100	95-100	90-100	20-30	5-10
	24-32	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	90-100	25-45	5-24
	32-65	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	90-100	25-45	5-24
20:* Grenada---------	0-6	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	90-100	<30	NP-6
	6-21	Silt loam, silty clay loam.	CL	A-6, A-4	0	100	100	95-100	90-100	27-40	8-19
	21-24	Silt loam--------	CL-ML, CL	A-4	0	100	100	95-100	90-100	20-30	5-10
	24-32	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	90-100	25-45	5-24
	32-65	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	90-100	25-45	5-24
Calloway--------	0-21	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	25-35	5-15
	21-51	Silt loam, silty clay loam.	CL	A-6	0	100	100	100	90-95	30-40	12-20
	51-65	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	25-35	5-15
11----------------Jena	0-7	Fine sandy loam	ML, SM	A-4, A-2-4	0	100	100	60-85	25-55	<22	NP-4
	7-38	Silt loam, very fine sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4, A-2-4	0	100	100	55-90	25-70	<22	NP-4
	38-65	Fine sandy loam, sandy loam, loamy fine sand.	SM	A-2-4, A-4	0	100	100	50-80	20-50	<22	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
13---------------- Kirkville	0-9	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-2, A-4	0	100	100	60-85	30-65	<20	NP-5
	9-60	Loam, sand loam, fine sandy loam.	ML, SM, CL-ML, SM-SC	A-2, A-4	0	100	100	60-100	30-65	<20	NP-5
3B, 3C, 3C3, 3D3- Lexington	0-6	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	70-95	25-42	5-16
	6-34	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	75-95	27-45	11-25
	34-56	Sandy loam, loam	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	50-85	20-65	22-35	5-15
	56-72	Loamy sand, sandy loam, clay loam.	SC, SM-SC	A-2, A-4, A-6	0	100	95-100	50-70	20-40	22-35	5-15
4B, 4C----------- Loring	0-9	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	9-24	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	8-20
	24-65	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	8-22
50---------------- Maben	0-5	Fine sandy loam	SM, SM-SC	A-4	0	95-100	90-100	70-85	36-50	<30	NP-7
	5-34	Clay, clay loam, silty clay.	MH, CH	A-7	0	90-100	90-100	90-100	75-95	50-80	18-40
	34-65	Variable	---	---	---	---	---	---	---	---	---
38:*											
Maben-----------	0-5	Fine sandy loam	SM, SM-SC	A-4	0	95-100	90-100	70-85	36-50	<30	NP-7
	5-34	Clay, clay loam, silty clay.	MH, CH	A-7	0	90-100	90-100	90-100	75-95	50-80	18-40
	34-65	Variable	---	---	---	---	---	---	---	---	---
Smithdale-------	0-5	Sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	5-22	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	22-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
Tippah----------	0-5	Silt loam--------	CL, CL-ML	A-4	0	100	100	90-100	70-90	20-30	4-10
	5-36	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	98-100	90-100	85-95	30-45	11-22
	36-65	Silty clay loam, silty clay, clay.	CH	A-7	0	100	99-100	80-100	60-95	50-65	25-40
14---------------- Oaklimeter	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	90-100	70-90	<30	NP-8
	7-23	Very fine sandy loam, silt loam, loam.	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	<30	NP-8
	23-65	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4	0	100	100	90-100	90-100	<30	NP-10
9----------------- Ochlockonee	0-24	Sandy loam-------	SM, ML, SM-SC, CL-ML	A-4	0	100	95-100	95-100	36-80	<26	NP-5
	24-60	Loamy sand, sandy loam, silt loam.	SM, ML, CL, SC	A-4, A-2	0	100	95-100	85-99	13-80	<32	NP-9

See footnote at end of table.

TABLE 15.--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	
41,* 40:*											
Ochlockonee	0-24	Sandy loam	SM, ML, SM-SC, CL-ML	A-4	0	100	95-100	95-100	36-80	<26	NP-5
	24-60	Loamy sand, sandy loam, silt loam.	SM, ML, CL, SC	A-4, A-2	0	100	95-100	85-99	13-80	<32	NP-9
Bruno	0-5	Loamy sand	SM, ML	A-2, A-4	0	100	100	60-85	30-60	<25	NP-3
	5-41	Sand, loamy sand	SP-SM, SM	A-2	0	100	100	60-80	10-30	---	NP
	41-60	Sand	SP-SM, SM	A-2, A-3	0	100	100	50-70	5-20	---	NP
Pt.* Pits											
2B, 2C, 2C3, 2D3- Providence	0-7	Silt loam	ML, CL, CL-ML	A-4	0	100	100	100	85-100	<30	NP-10
	7-23	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	30-45	11-20
	23-41	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-90	25-40	11-20
	41-65	Loam, clay loam, sandy clay loam.	CL, SC	A-6, A-4	0	100	95-100	70-95	40-80	20-35	8-18
7F Smithdale	0-5	Sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	5-22	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	22-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
7:*											
Smithdale	0-5	Sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	5-22	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	22-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
Udorthents.											
70:*											
Smithdale	0-5	Sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	5-22	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	22-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
Lucy	0-28	Loamy sand	SM, SP-SM	A-2	0	98-100	95-100	50-87	10-30	---	NP
	28-35	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	10-30	NP-15
	35-65	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
71:*											
Smithdale	0-5	Sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	5-22	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	22-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
Udorthents.											
5B, 5C, 5D Tippah	0-5	Silt loam	CL, CL-ML	A-4	0	100	100	90-100	70-90	20-30	4-10
	5-36	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	98-100	90-100	85-95	30-45	11-22
	36-65	Silty clay loam, silty clay, clay.	CH	A-7	0	100	99-100	80-100	60-95	50-65	25-40

See footnote at end of table.

TABLE 15.--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	
8E---------------- Wilcox	0-5	Silt loam--------	CL, CH	A-7	0	100	100	95-100	80-95	41-51	19-25
	5-54	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	80-95	50-72	28-46
	54-65	Clay-------------	CH	A-7	0	100	100	90-100	75-95	60-80	39-55
44:*											
Wilcox----------	0-5	Silt loam--------	CL, CH	A-7	0	100	100	95-100	80-95	41-51	19-25
	5-54	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	80-95	50-72	28-46
	54-65	Clay-------------	CH	A-7	0	100	100	90-100	75-95	60-80	39-55
Tippah----------	0-5	Silt loam--------	CL, CL-ML	A-4	0	100	100	90-100	70-90	20-30	4-10
	5-36	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	98-100	90-100	85-95	30-45	11-22
	36-65	Silty clay loam, silty clay, clay.	CH	A-7	0	100	99-100	80-100	60-95	50-65	25-40

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
51---------------Arkabutla	0-5	5-25	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.37	5	1-3
	5-60	20-35	1.45-1.55	0.6-2.0	0.18-0.21	4.5-5.5	Low-----------	0.32		
18:*										
Arkabutla--------	0-5	5-25	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.37	5	1-3
	5-60	20-35	1.45-1.55	0.6-2.0	0.18-0.21	4.5-5.5	Low-----------	0.32		
Chenneby---------	0-65	12-35	---	0.6-2.0	0.15-0.20	4.5-6.0	Low-----------	0.32	4	.5-2
6A---------------Calloway	0-21	10-30	1.40-1.55	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
	21-51	10-32	1.35-1.55	0.06-0.2	0.09-0.12	4.5-6.0	Moderate------	0.43		
	51-65	16-32	1.45-1.55	0.06-0.2	0.09-0.12	5.1-7.8	Low-----------	0.43		
16---------------Cascilla	0-5	5-20	1.40-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low-----------	0.43	5	1-3
	5-65	18-30	1.45-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low-----------	0.43		
10---------------Chenneby	0-65	12-35	---	0.6-2.0	0.15-0.20	4.5-6.0	Low-----------	0.32	4	.5-2
12---------------Gillsburg	0-33	6-18	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.43	5	1-3
	33-60	10-18	1.40-1.55	0.2-0.6	0.16-0.18	4.5-5.5	Low-----------	0.43		
6B---------------Grenada	0-6	12-16	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.43	3	.5-2
	6-21	18-30	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.43		
	21-24	12-16	1.35-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.43		
	24-32	15-32	1.45-1.60	0.06-0.2	0.10-0.12	4.5-6.0	Low-----------	0.37		
	32-65	15-32	1.45-1.60	0.06-0.2	0.10-0.12	5.1-7.3	Low-----------	0.37		
20:*										
Grenada----------	0-6	12-16	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.43	3	.5-2
	6-21	18-30	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.43		
	21-24	12-16	1.35-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.43		
	24-32	15-32	1.45-1.60	0.06-0.2	0.10-0.12	4.5-6.0	Low-----------	0.37		
	32-65	15-32	1.45-1.60	0.06-0.2	0.10-0.12	5.1-7.3	Low-----------	0.37		
Calloway---------	0-21	10-30	1.40-1.55	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
	21-51	10-32	1.35-1.55	0.06-0.2	0.09-0.12	4.5-6.0	Moderate------	0.43		
	51-65	16-32	1.45-1.55	0.06-0.2	0.09-0.12	5.1-7.8	Low-----------	0.43		
11---------------Jena	0-7	10-20	1.30-1.70	0.6-2.0	0.12-0.20	4.5-6.0	Low-----------	0.28	5	.5-2
	7-38	10-18	1.40-1.80	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.28		
	38-65	5-20	1.35-1.65	2.0-6.0	0.08-0.14	4.5-5.5	Low-----------	0.24		
13---------------Kirkville	0-9	10-20	1.30-1.50	0.6-2.0	0.15-0.15	4.5-5.5	Low-----------	0.28	5	---
	9-60	10-18	1.35-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low-----------	0.28		
3B, 3C, 3C3, 3D3-Lexington	0-6	12-30	1.30-1.50	0.6-2.0	0.17-0.22	4.5-6.0	Low-----------	0.43	3	.5-2
	6-34	20-33	1.40-1.55	0.6-2.0	0.16-0.21	4.5-6.0	Low-----------	0.43		
	34-56	15-29	1.30-1.50	2.0-6.0	0.06-0.12	4.5-6.0	Low-----------	0.24		
	56-72	9-30	1.20-1.55	2.0-6.0	0.05-0.10	4.5-6.0	Low-----------	0.24		
4B, 4C-----------Loring	0-9	8-18	1.3-1.5	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.43	3	.5-2
	9-24	18-35	1.4-1.5	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43		
	24-65	12-25	1.5-1.7	0.2-0.6	0.06-0.13	4.5-6.0	Low-----------	0.43		
50---------------Maben	0-5	5-20	1.40-1.50	0.6-2.0	0.12-0.16	5.6-6.5	Low-----------	0.37	3	.5-1
	5-34	35-55	1.45-1.55	0.2-0.6	0.14-0.18	4.5-6.0	High----------	0.28		
	34-40	---	---	0.2-0.6	0.14-0.18	4.5-6.0	Moderate------	0.28		
	40-65	---	---	0.2-0.6	0.10-0.15	4.5-6.0	Low-----------	----		
38:*										
Maben------------	0-5	5-20	1.40-1.50	0.6-2.0	0.12-0.16	5.6-6.5	Low-----------	0.37	3	.5-1
	5-34	35-55	1.45-1.55	0.2-0.6	0.14-0.18	4.5-6.0	High----------	0.28		
	34-40	---	---	0.2-0.6	0.14-0.18	4.5-6.0	Moderate------	0.28		
	40-65	---	---	0.2-0.6	0.10-0.15	4.5-6.0	Low-----------	----		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
38:*										
Smithdale-------	0-5	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
	5-22	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	22-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
Tippah----------	0-5	5-20	1.35-1.45	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43	4	.5-2
	5-36	20-35	1.40-1.50	0.6-2.0	0.19-0.21	4.5-6.0	Moderate------	0.43		
	36-65	30-55	1.40-1.55	0.06-0.2	0.16-0.18	4.5-6.0	High----------	0.24		
14--------------- Oaklimeter	0-7	10-16	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.43	5	.5-2
	7-23	7-18	1.40-1.50	0.6-2.0	0.15-0.20	4.5-5.5	Low-----------	0.43		
	23-65	7-30	1.40-1.50	0.6-2.0	0.20-0.20	4.5-5.5	Low-----------	0.43		
9---------------- Ochlockonee	0-24	3-18	---	2.0-6.0	0.07-0.14	4.5-5.5	Low-----------	0.20	5	.5-2
	24-60	3-18	---	2.0-6.0	0.06-0.12	4.5-5.5	Low-----------	0.17		
41,* 40:*										
Ochlockonee-----	0-24	3-18	---	2.0-6.0	0.07-0.14	4.5-5.5	Low-----------	0.20	5	.5-2
	24-60	3-18	---	2.0-6.0	0.06-0.12	4.5-5.5	Low-----------	0.17		
Bruno-----------	0-5	3-10	1.20-1.40	6.0-20	0.10-0.15	5.1-7.8	Low-----------	0.17	5	.5-2
	5-41	2-8	1.20-1.40	6.0-20	0.05-0.10	5.1-7.8	Low-----------	0.17		
	41-60	2-8	1.20-1.30	6.0-20	0.02-0.05	5.1-7.8	Very low-----	0.17		
Pt.* Pits										
2B, 2C, 2C3, 2D3- Providence	0-7	5-12	1.30-1.40	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43	3	.5-3
	7-23	18-30	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43		
	23-41	20-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Moderate------	0.32		
	41-65	12-25	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low-----------	0.32		
7F--------------- Smithdale	0-5	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
	5-22	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	22-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
7:*										
Smithdale-------	0-5	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
	5-22	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	22-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
Udorthents.										
70:*										
Smithdale-------	0-5	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
	5-22	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	22-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
Lucy------------	0-28	1-12	---	6.0-20	0.06-0.10	5.1-5.5	Low-----------	0.20	5	.5-1
	28-35	10-30	---	2.0-6.0	0.10-0.12	4.5-5.5	Low-----------	0.24		
	35-65	20-35	---	0.6-2.0	0.12-0.14	4.5-5.5	Low-----------	0.28		
71:*										
Smithdale-------	0-5	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
	5-22	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	22-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
Udorthents.										
5B, 5C, 5D------- Tippah	0-5	5-20	1.35-1.45	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43	4	.5-2
	5-36	20-35	1.40-1.50	0.6-2.0	0.19-0.21	4.5-6.0	Moderate------	0.43		
	36-65	30-55	1.40-1.55	0.06-0.2	0.16-0.18	4.5-6.0	High----------	0.24		
8E--------------- Wilcox	0-5	15-55	1.40-1.45	0.06-0.2	0.19-0.21	4.5-5.5	High----------	0.37	4	.5-2
	5-54	38-60	1.40-1.50	<0.06	0.18-0.20	3.6-5.5	High----------	0.32		
	54-65	40-70	1.40-1.55	<0.06	0.15-0.18	3.6-5.5	High----------	0.28		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
44:*										
Wilcox----------	0-5	15-55	1.40-1.45	0.06-0.2	0.19-0.21	4.5-5.5	High---------	0.37	4	.5-2
	5-54	38-60	1.40-1.50	<0.06	0.18-0.20	3.6-5.5	High---------	0.32		
	54-65	40-70	1.40-1.55	<0.06	0.15-0.18	3.6-5.5	High---------	0.28		
Tippah----------	0-5	5-20	1.35-1.45	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43	4	.5-2
	5-36	20-35	1.40-1.50	0.6-2.0	0.19-0.21	4.5-6.0	Moderate-----	0.43		
	36-65	30-55	1.40-1.55	0.06-0.2	0.16-0.18	4.5-6.0	High---------	0.24		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the text explain terms such as "rare," "brief," "apparent," and "perched." The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Uncoated steel	Concrete
					Ft			In			
51----------------- Arkabutla	C	Occasional	Brief to very long.	Jan-Apr	1.5-2.5	Apparent	Jan-Apr	>60	---	High-----	High.
18:*											
Arkabutla---------	C	Frequent----	Brief to very long.	Jan-Apr	1.5-2.5	Apparent	Jan-Apr	>60	---	High-----	High.
Chenneby----------	C	Frequent----	Brief to very long.	Jan-Apr	1.0-2.5	Apparent	Jan-Apr	>60	---	High-----	Moderate.
6A----------------- Calloway	C	None---------	---	---	1.0-2.0	Perched	Jan-Apr	>60	---	High-----	Moderate.
16----------------- Cascilla	B	Occasional	Brief to very long.	Jan-Apr	>6.0	---	---	>60	---	Low------	Moderate.
10----------------- Chenneby	C	Occasional	Very brief	Dec-Apr	1.0-2.5	Apparent	Jan-Mar	>60	---	High-----	Moderate.
12----------------- Gillsburg	C	Occasional	Brief to very long.	Jan-Mar	1.0-1.5	Apparent	Jan-Apr	>60	---	High-----	High.
6B----------------- Grenada	C	None---------	---	---	1.5-2.5	Perched	Jan-Apr	>60	---	Moderate	Moderate.
20:*											
Grenada-----------	C	Frequent----	Very long	Jan-Jul	1.5-2.5	Perched	Jan-Jul	>60	---	Moderate	Moderate.
Calloway----------	C	Frequent----	Very long	Jan-Jul	1.0-2.0	Perched	Jan-Jul	>60	---	High-----	Moderate.
11----------------- Jena	B	Occasional	Very brief to long.	Dec-Apr	>6.0	---	---	>60	---	Low------	High.
13----------------- Kirkville	C	Occasional	Brief-----	Jan-Apr	1.5-2.5	Apparent	Jan-Apr	>60	---	Moderate	High.
3B, 3C, 3C3, 3D3-- Lexington	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
4B, 4C------------ Loring	C	None---------	---	---	2.0-3.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
50----------------- Maben	C	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
38:*											
Maben-------------	C	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
Smithdale---------	B	None---------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Tippah------------	C	None---------	---	---	2.0-2.5	Perched	Dec-Apr	>60	---	High-----	High.
14----------------- Oaklimeter	C	Occasional	Brief to very long.	Nov-Apr	1.5-2.5	Apparent	Nov-Mar	>60	---	Moderate	High.
9------------------ Ochlockonee	B	Occasional	Very brief	Dec-Apr	3.0-4.0	Apparent	Dec-Apr	>60	---	Low------	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Uncoated steel	Concrete
					Ft			In			
41,* 40:*											
Ochlockonee------	B	Frequent----	Very brief to long.	Dec-Jun	3.0-4.0	Apparent	Dec-Apr	>60	---	Low------	High.
Bruno------------	A	Frequent----	Very brief to long.	Dec-Jun	4.0-6.0	Apparent	Dec-Apr	>60	---	Low------	Low.
Pt.* Pits											
2B, 2C, 2C3, 2D3-- Providence	C	None--------	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	Moderate	Moderate.
7F--------------- Smithdale	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
7:*											
Smithdale--------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Udorthents.											
70:*											
Smithdale--------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Lucy-------------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
71:*											
Smithdale--------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Udorthents.											
5B, 5C, 5D-------- Tippah	C	None--------	---	---	2.0-2.5	Perched	Dec-Apr	>60	---	High-----	High.
8E--------------- Wilcox	D	None--------	---	---	1.5-3.0	Perched	Jan-Apr	40-60	Soft	High-----	High.
44:*											
Wilcox-----------	D	None--------	---	---	1.5-3.0	Perched	Jan-Apr	40-60	Soft	High-----	High.
Tippah-----------	C	None--------	---	---	2.0-2.5	Perched	Dec-Apr	>60	---	High-----	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--PHYSICAL AND CHEMICAL ANALYSES OF SELECTED SOILS

Soil series and sample number	Horizon	Depth	Particle size distribution			Extractable bases				Extractable acidity	Sums of cations	Base saturation	Reaction 1:1 soil:water	Organic matter
			Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (less than 0.002 mm)	Ca	Mg	K	Na					
		In	Pct	Pct	Pct	meq/100 g						Pct	pH	Pct
Cascilla. S77MS-071-3	Ap	0-5	4.9	70.9	24.2	0.3	0.5	0.3	-	8.2	9.3	11.8	4.5	3.1
	B21	5-28	8.3	64.9	26.8	0.3	0.5	0.2	-	10.3	11.3	8.8	4.5	2.7
	B22	28-38	10.4	71.8	17.8	0.1	0.4	0.2	-	8,4	9.1	7.7	4.5	2.0
	B23	38-44	9.9	66.7	23.4	0.1	0.6	0.2	0.1	9.4	10.4	9.6	4.6	2.3
	B3	44-65	17.1	65.1	17.8	0.1	0.3	0.2	-	8.4	9.0	6.7	4.5	1.8
Chenneby. S77MS-071-2	Ap	0-6	4.3	69.2	26.5	0.5	0.9	0.6	-	9.9	11.9	16.8	4.9	4.4
	B1	6-18	6.8	65.7	27.5	0.2	0.7	0.3	-	11.0	12.2	9.8	4.7	4.3
	B21	18-31	9.6	63.8	26.6	0.2	0.7	0.2	-	10.8	11.9	9.2	4.5	2.9
	B22	31-46	14.4	62.2	23.4	0.4	0.5	0.2	-	9.3	10.4	10.6	4.5	2.4
	Cg	46-65	16.1	62.5	21.4	-	1.3	0.2	-	9.0	10.5	14.3	4.6	2.1
Lexington. S77MS-071-1	Ap	0-6	9.6	75.0	15.4	3.2	1.6	1.2	-	3.0	9.0	66.7	6.5	8.0
	B21t	6-24	3.2	65.9	30.9	1.5	3.4	0.4	0.1	2.2	7.6	71.0	6.2	2.8
	B22t	24-34	9.4	66.3	24.3	1.1	3.0	0.3	0.1	1.9	6.4	70.3	5.4	1.8
	IIB23t	34-56	33.1	49.2	17.7	1.0	1.8	0.3	0.2	2.0	5.3	62.3	5.6	1.5
	IIB24t	56-72	53.0	29.3	17.7	0.2	1.6	0.2	0.1	1.5	3.6	58.3	5.7	1.7
Ochlockonee. S77MS-071-5	Ap	0-6	62.7	31.0	6.3	0.2	0.4	0.5	-	2.0	3.1	35.5	5.7	1.4
	C1	6-9	31.6	57.8	10.6	0.2	0.6	0.3	-	3.6	4.7	23.4	5.0	1.6
	C2	9-19	66.5	27.2	6.3	0.4	0.4	0.2	-	1.6	2.6	38.5	5.2	0.9
	C3	19-24	31.0	55.1	13.9	0.4	0.9	0.2	-	3.5	5.0	30.0	4.9	1.6
	C4	24-29	5.7	79.1	15.2	0.4	1.9	0.2	-	4.5	7.0	35.7	4.6	1.8
	C5	29-53	20.6	64.7	14.7	0.4	1.7	0.2	-	3.9	6.2	37.1	4.6	1.6
Providence. S77MS-071-7	Ap	0-7	12.4	75.7	11.9	0.6	0.6	0.3	-	4.1	5.6	26.8	5.3	2.9
	B21t	7-18	3.2	74.3	22.5	0.8	1.3	0.2	-	8.1	10.4	22.1	4.7	3.0
	B22t	18-23	2.5	75.5	22.0	0.6	1.7	0.2	0.1	9.3	11.9	21.8	4.6	2.5
	Bx1	23-41	6.1	71.5	22.4	0.7	2.9	0.2	0.4	7.6	11.8	35.6	4.7	1.9
	IIBx2	41-65	15.1	63.7	20.9	1.2	3.3	0.2	0.4	3.4	8.5	60.0	5.1	2.0
Smithdale. S77MS-071-4	Ap	0-5	59.1	37.9	3.0	0.5	0.3	0.1	-	6.7	7.6	11.8	4.9	3.4
	B21t	5-22	61.1	15.4	23.5	0.3	0.9	0.1	-	6.3	7.6	17.1	4.8	2.5
	B22t	22-41	67.1	9.0	23.9	-	0.8	0.1	-	5.5	6.4	14.1	4.9	2.8
	B23t	41-62	81.0	4.6	14.4	-	0.6	0.1	-	4.6	5.3	13.2	4.7	1.9
	B24t	62-80	83.0	3.9	13.1	-	0.4	0.1	-	3.5	4.0	12.5	4.9	1.6

TABLE 19.--ENGINEERING INDEX TEST DATA

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution: Percentage passing sieve--				Percentage smaller than--			Liquid limit	Plasticity index	Moisture density		Shrinkage		
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture	Limit	Linear	Ratio
										Pct		Lb/ Ft^3	Pct	Pct	Pct	Pct
Chenneby sil:[1] (S77MS-071-002)																
Ap------- 0 to 6	A-4 (08)	ML	100	100	99	92	66	30	19	33	8	102	20	19.0	0.0	1.6
B21------18 to 31	A-6 (15)	CL	100	100	99	91	66	36	27	39	16	105	18	19.0	0.0	1.6
Cg-------46 to 65	A-6 (08)	CL	100	100	95	82	53	30	23	32	11	108	17	18.0	0.0	1.7
Lexington sil:[2] (S77MS-071-001)																
Ap------- 0 to 6	A-4 (03)	ML	100	100	96	87	51	16	12	39	7	96	20	0.0	0.0	0.0
B21t----- 6 to 24	A-7-6(21)	CL	100	100	99	96	66	31	24	44	19	103	19	18.0	0.0	1.7
IIB24t---56 to 72	A-6 (02)	SC	100	100	84	46	33	21	18	26	12	120	11	12.0	0.0	1.8

[1]Chenneby silt loam: 600 feet east of Mississippi Highway 7 and 300 feet south of Yocona River; SE1/4NW1/4 sec. 28, T. 9 S., R. 3 W.

[2]Lexington silt loam: 0.5 mile west of Mississippi Highway 30 on gravel road and 100 feet north of gravel road; NE1/4NW1/4 sec. 8, T. 8 S., R. 2 W.

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Arkabutla	Fine-silty, mixed, acid, thermic Aeric Fluvaquents
Bruno	Sandy, mixed, thermic Typic Udifluvents
Calloway	Fine-silty, mixed, thermic Glossaquic Fragiudalfs
Cascilla	Fine-silty, mixed, thermic Fluventic Dystrochrepts
Chenneby	Fine-silty, mixed, thermic Fluvaquentic Dystrochrepts
Gillsburg	Coarse-silty, mixed, acid, thermic Aeric Fluvaquents
Grenada	Fine-silty, mixed, thermic Glossic Fragiudalfs
Jena	Coarse-loamy, siliceous, thermic Fluventic Dystrochrepts
Kirkville	Coarse-loamy, siliceous, thermic Fluvaquentic Dystrochrepts
Lexington	Fine-silty, mixed, thermic Typic Paleudalfs
Loring	Fine-silty, mixed, thermic Typic Fragiudalfs
Lucy	Loamy, siliceous, thermic Arenic Paleudults
Maben	Fine, mixed, thermic Ultic Hapludalfs
Oaklimeter	Coarse-silty, mixed, thermic Fluvaquentic Dystrochrepts
Ochlockonee	Coarse-loamy, siliceous, acid, thermic Typic Udifluvents
Providence	Fine-silty, mixed, thermic Typic Fragiudalfs
Smithdale	Fine-loamy, siliceous, thermic Typic Paleudults
Tippah	Fine-silty, mixed, thermic Aquic Paleudalfs
Wilcox	Fine, montmorillonitic, thermic Vertic Hapludalfs

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