United States Department of Agriculture

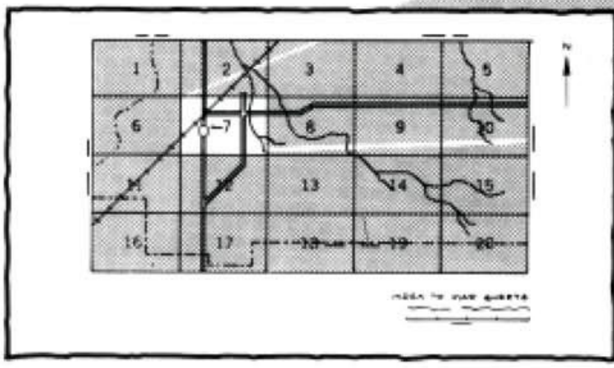
Soil Conservation Service

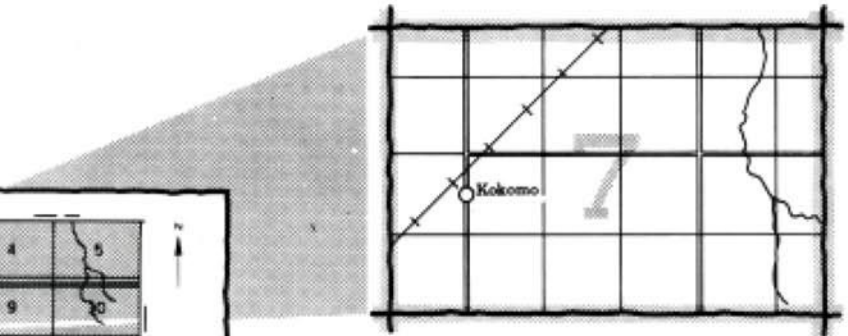
In Cooperation with United States Department of Agriculture, Forest Service, and Mississippi Agricultural and Forestry Experiment Station

Soil Survey of Copiah County Mississippi

HOW TO USE

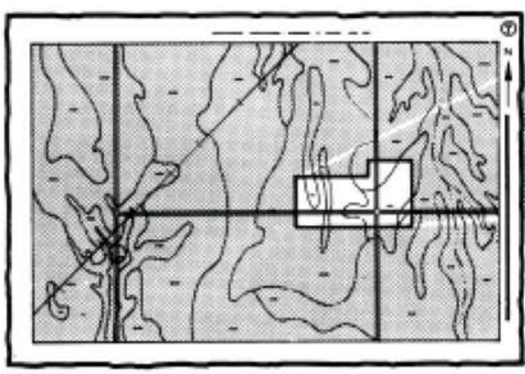
1. Locate your area of interest on the "Index to Map Sheets"

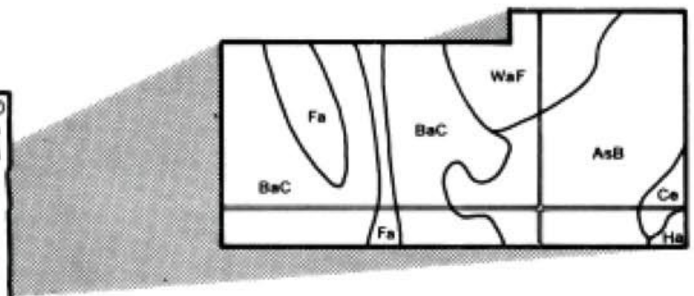




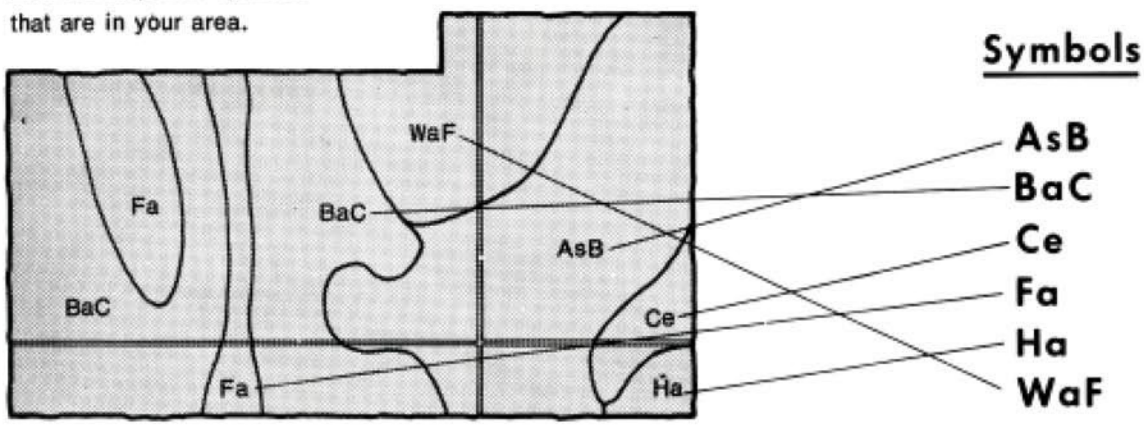
2. Note the number of the map sheet and turn to that sheet.

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



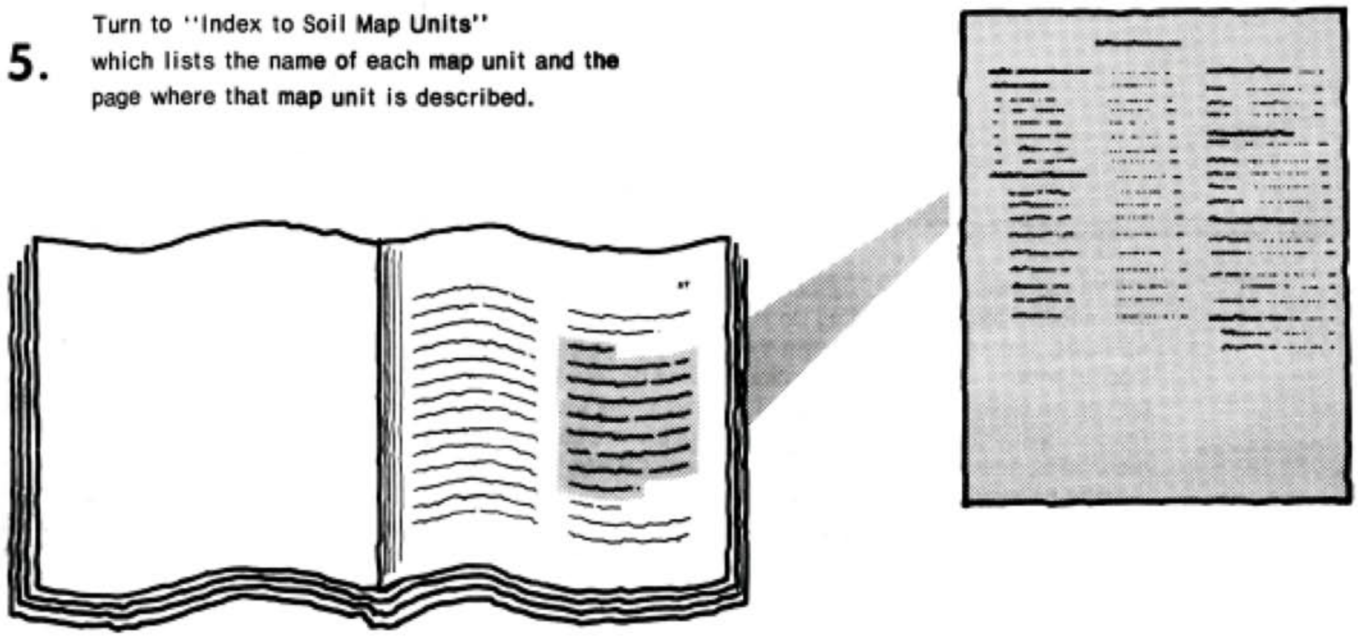


4. List the map unit symbols that are in your area.

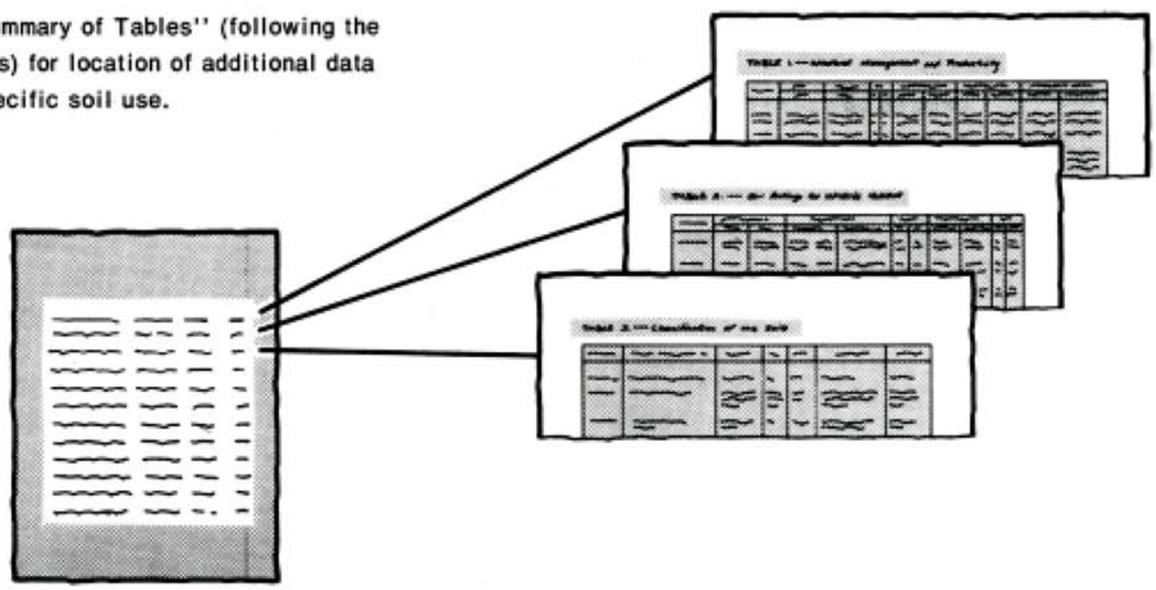


THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was performed in the period 1970-80. Soil names and descriptions were approved in 1979. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. 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 Copiah 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: Falls on Turkey Creek in an area of Lorman-Smithdale association, hilly. Rock layer is more than 6 feet below soil surface, except in stream channels.

Contents

Soil series

Issued November 1984

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Summary of tables

Foreword

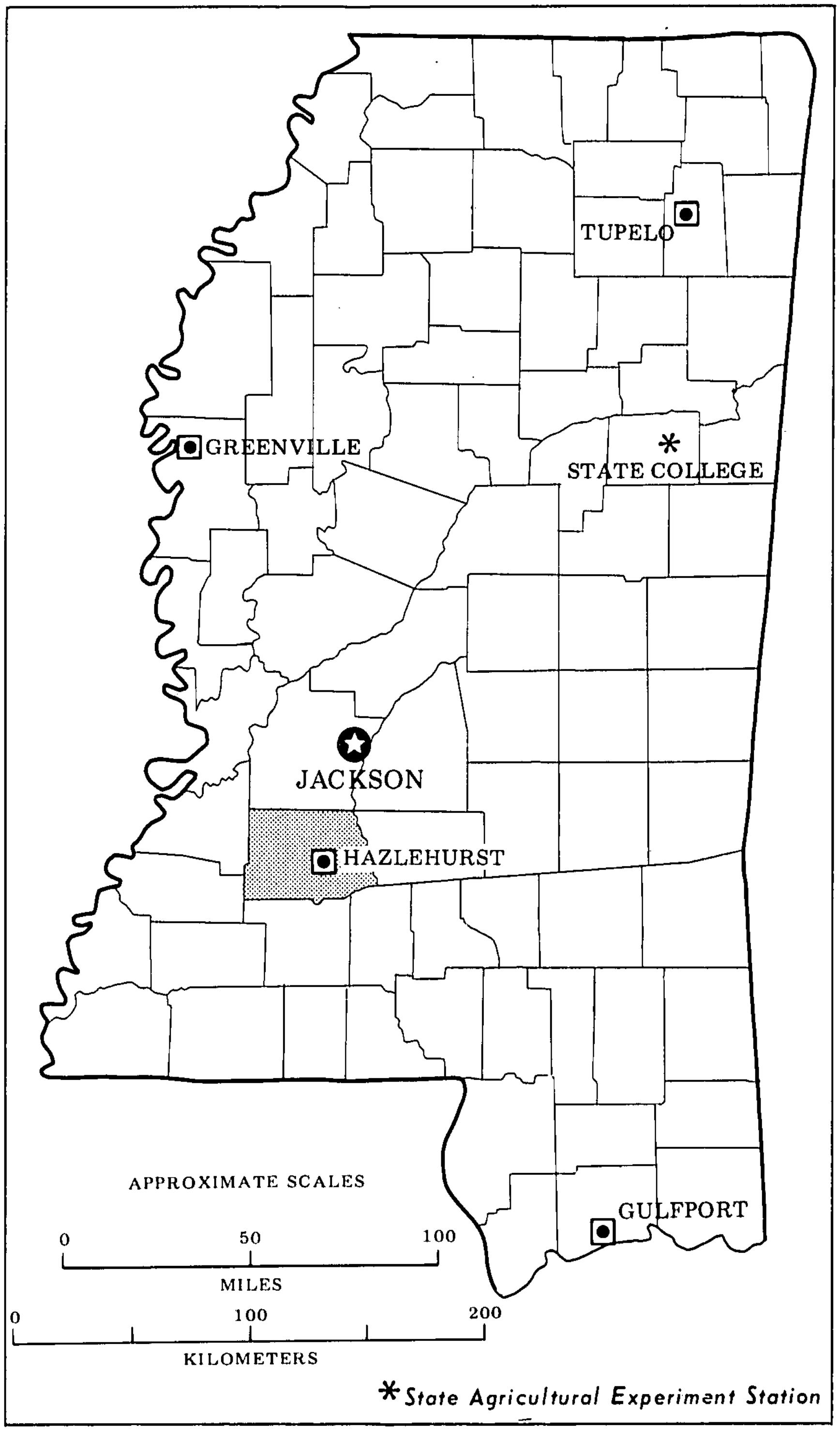
This soil survey contains information that can be used in land-planning programs in Copiah County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact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

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

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

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

Billy C. Griffin
State Conservationist
Soil Conservation Service



Location of Copiah County in Mississippi.

Soil survey of
Copiah County, Mississippi

By Allen C. Milbrandt, Soil Conservation Service

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

COPIAH COUNTY is in the southwestern part of the state. The county covers an area of about 781 square miles, or 499,840 acres. Hazlehurst, the county seat, has a population of about 4,600. The population of the county in 1970 was about 24,700 (*11*).

The county is somewhat rectangular in shape. On the south border, an off-set was made so that the whole town of Wesson would be included in Copiah County. The eastern boundary of the county is the Pearl River. At its longest and widest points, Copiah County extends about 37 miles from east to west and 25 miles from north to south. It is joined on the north by Hinds County, on the east by Simpson County, on the south by Lawrence and Lincoln Counties, and on the west by Jefferson and Claiborne Counties.

Farming is the main source of income in the county. The climate is favorable for crops, livestock, and woodland. Beef cattle, cotton, forest products, and soybeans are the main sources of agricultural income in the county. Many employees from industrial plants in the area are part-time farmers. Gravel pits in the county, varying in size from 5 to 640 acres, also contribute to the economy of the county.

Soil scientists mapped about 22 different kinds of soils in Copiah County. The soils range widely in texture, natural drainage, and other characteristics. Those in the eastern part of the county, along the Pearl River, are mostly level to gently sloping, are well drained to poorly drained, and have a sandy, loamy, or silty subsoil. Flooding and wetness are the major limitations to the use of soils in this area. If artificially drained and well managed, the soils are well suited to field crops, pasture, and trees.

In the central part of the county, the soils on uplands are nearly level to steep. They are dominantly well drained to moderately well drained and have a loamy, sandy, clayey, or gravelly subsoil. These upland areas are bisected by wide and narrow, nearly level flood plains. The hazard of erosion on upland soils is generally severe. Good management helps control erosion and reduce sedimentation in streams. If well managed, the soils are well suited to field crops, pasture, and trees. The soils on the flood plains are dominantly well drained to poorly drained and silty throughout.

In the western part of the county, the soils on uplands are nearly level to steep. They are dominantly well drained to moderately well drained soils that have silty or loamy subsoil. These upland areas are bisected by narrow, nearly level flood plains. On the upland areas, the erosion hazard is severe. Good management helps control erosion and reduce sedimentation in the streams. If well managed, the nearly level and gently sloping soils are well suited to field crops, pasture, and trees. Steep soils are poorly suited to crops and pasture, but are well suited to trees. The soils on the flood plains are dominantly well drained to poorly drained and silty throughout.

An older survey of the Crystal Springs Area of Copiah County was published in 1905 (*6*). The present survey updates the earlier survey and provides additional information and larger maps that show the soils in greater detail.

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those on soil maps of adjacent counties. Differences are the result of more information about the soils, modifications in series concepts, intensity of mapping, or the extent of the soils within the county.

General nature of the county

This section gives general information about the county. It discusses climate, history, physiography, and agriculture.

Climate

Prepared by the National Climatic Center, Asheville, N.C.

Copiah 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. Snowfall is rare. 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 Allen, Miss., in the period 1963 to 1975. 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 50° F, and the average daily minimum temperature is 38°. The lowest temperature on record, which occurred at Allen on January 9, 1970, is 7°. In summer the average temperature is 79°, and the average daily maximum temperature is 91°. The highest recorded temperature, which occurred on June 29, 1969, is 105°.

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

The total annual precipitation is 56 inches. Of this, 27 inches, or 48 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 22 inches. The heaviest 1-day rainfall during the period of record was 10.75 inches at Allen on October 4, 1964. Thunderstorms occur on about 70 days each year, and most occur in summer.

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 sun shines 60 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 9 miles per hour, in winter.

Severe local storms of short duration, including tornadoes, occasionally strike in the area or strike nearby.

History

Copiah County was one of nine counties formed from land ceded to the United States by the Treaty of Doak's Stand, 1820, Second Choctaw Cession. It was created January 2, 1823, and was named Copiah, an Indian word meaning "calling panther." A year later the county was divided into two counties, and the area east of the Pearl River became Simpson County.

The first county seat was at Coor's Spring; the county offices remained there for about a year. In 1824, the county seat was moved to Gallatin, where it remained until 1872. When a major railroad was constructed, the county seat was moved to its present site beside the railroad, and the town, Hazlehurst, was named for an engineer who helped survey the railroad.

About 30 industries are located in the county and produce numerous types of products. Most of these plants are either in or near Hazlehurst, Crystal Springs, or Wesson.

Physiography

The topography of Copiah County includes high, rugged hills with steep hillsides and narrow valleys; lower more rolling hills; wider valleys and gentler slopes; and wide nearly level flood plains. A prominent ridge runs generally north and south across the central part of the county and forms a divide between the drainage basins—Pearl River, in the eastern part of the county, and Bayou Pierre and Homochitto River, in the western part of the county. The highest elevation in the county is along the southern part of the divide and is 488.5 feet; and the lowest is less than 150 feet. The area of greatest relief is in the Homochitto Hills, Scutchalo Hills, and the northwestern part of the county. Here the ridge crests are as high as 200 feet above the valley floor.

Copiah County is drained chiefly by tributaries of the Homochitto River, Bayou Pierre, and Pearl River. Drainage in the northeast is by Haley and Brushy Creeks and into the Pearl River; in the southeast, drainage is by Copiah, Pegies, and Big Bahala Creeks and into the Pearl River. Drainage in the southwest is into the Homochitto River, and in the central and northwest parts of the county drainage is into Bayou Pierre from Foster, Jackson, Jones, Long, Turkey, and White Oak Creeks and many minor creeks.

Agriculture

Since the earliest non-Indian settlements in Copiah County, cotton and truck crops, including tomatoes, cabbage, and peppers, have been cash crops. In the early years, in addition to cotton, the farmers produced corn, vegetables, and enough beef and pork to supply their needs.

The acreage of principal crops in 1974 was as follows: cotton 2,600 acres, corn 1,500 acres, soybeans 14,200 acres, and wheat 1,000 acres (*12*).

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.

Descriptions of the general soil map units follow.

Level to gently sloping soils that are excessively drained to poorly drained, subject to flooding

1. Bruno-Cahaba-Latonia

Nearly level to gently sloping, excessively drained and well drained loamy soils and well drained sandy soils; on flood plains, stream terraces, and natural levees

These soils are mainly in the eastern part of Copiah County on flood plains, natural levees, and terraces adjacent to the Pearl River. The landscape is mainly nearly level; it has noticeable shallow drainageways, depressions, and many old river runs and a few oxbow lakes. Slopes range from 0 to 5 percent.

This map unit makes up about 3 percent of the county. It is about 40 percent Bruno soils, 20 percent Cahaba soils, 20 percent Latonia soils, and 20 percent minor soils.

Bruno soils are excessively drained and are on flood plains that are frequently flooded. They formed in sandy alluvium.

Cahaba soils are well drained and are on stream terraces. They formed in loamy and sandy materials.

Latonia soils are well drained and are on natural levees of the Pearl River that are occasionally flooded. They formed in sandy material.

The minor soils are the somewhat poorly drained Arkabutla soils, the poorly drained Guyton soils, and the well drained Velda soils on flood plains and stream terraces. Also included are the moderately well drained Columbus soils on stream terraces.

Most of the acreage of this unit has been cleared and is used for pasture or crops. Bruno soils are poorly suited to row crops because of frequent flooding. Cahaba and Latonia soils are well suited to row crops that are commonly grown in the county. Bruno soils are poorly suited to grasses and legumes because of low productivity. Cahaba and Latonia soils are well suited to grasses and legumes.

The soils of this unit are well suited to woodland.

Bruno and Latonia soils are severely limited for urban uses because of flooding. The Cahaba soils have slight limitations for most urban uses.

Bruno soils of this unit have poor potential for use as habitat for openland and woodland wildlife and very poor potential for habitat for wetland wildlife. Cahaba and Latonia soils have good potential for use as habitat for openland and woodland wildlife and very poor potential for habitat for wetland wildlife.

2. Guyton-Columbus-Arkabutla

Level and nearly level poorly drained silty soils, moderately well drained loamy soils, and somewhat poorly drained silty soils; on broad to depressional flats, stream terraces, and depressions of flood plains

These soils are mainly in the eastern part of Copiah County on flood plains and stream terraces along the Pearl River. The landscape is nearly level, but it has broad depressional flats and higher lying stream terrace flats; it has shallow drainageways and a few old river runs and oxbow lakes. Slopes range from 0 to 2 percent.

This map unit makes up about 5 percent of the county. It is about 40 percent Guyton soils, 24 percent Columbus soils, 10 percent Arkabutla soils, and 26 percent minor soils.

Guyton soils are poorly drained and are on broad to depressional flats and stream terraces that are usually flooded several times a year. They formed in silty materials.

Columbus soils are moderately well drained on broad nearly level areas of stream terraces. They formed in loamy material.

Arkabutla soils are somewhat poorly drained, are frequently flooded, and are on the depressions of broad flood plains. They formed in silty alluvium.

The minor soils are the well drained Cahaba soils on stream terraces and the moderately well drained Oaklimeter soils and the somewhat poorly drained Gillsburg soils on flood plains. The moderately well drained Kolin and Providence soils are on uplands and stream terraces.

The soils of this unit are used mostly for woodland. About a third of the acreage has been cleared and is used for pasture or row crops. Guyton and Arkabutla soils are poorly suited to row crops. Guyton soils are poorly suited and Arkabutla soils are suited to grasses and legumes. Frequent flooding and wetness are the main limitations for farming and most other uses on these soils. Columbus soils are well suited to row crops as well as grasses and legumes.

The soils of this map unit are well suited to woodland.

Guyton and Arkabutla soils are severely limited for urban uses because of flooding and wetness. Columbus soils are moderately limited because of wetness and because of low strength, which is a limitation for streets and roads.

Guyton soils have poor potential for use as openland wildlife habitat, fair potential for woodland wildlife habitat, and good potential for wetland habitat. Columbus soils have good potential for use as openland and woodland wildlife habitat and very poor potential for wetland wildlife habitat. Arkabutla soils have fair potential for openland wildlife habitat, good potential for woodland habitat, and fair potential for wetland habitat.

3. Gillsburg-Oaklimeter-Ariel

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

These soils are on the nearly level flood plains throughout the county. The soils are subject to occasional flooding generally in winter or early spring. Slopes range from 0 to 2 percent.

This map unit makes up about 16 percent of the county. It is about 42 percent Gillsburg soils, 23 percent Oaklimeter soils, 21 percent Ariel soils, and 14 percent minor soils.

Gillsburg soils are generally on the broader areas of flood plains. They are somewhat poorly drained soils that formed in silty alluvium.

Oaklimeter soils are on broad flood plains near the streams. They are moderately well drained soils that formed in silty alluvium.

Ariel soils are on flood plains, near streams. They are well drained soils that formed in silty alluvium.

The minor soils are the somewhat poorly drained Bude soils on a stream terrace or upland position, the poorly drained Guyton soils on lower positions on flats and stream terraces, and the moderately well drained Providence soils that have a fragipan and that are on uplands and terraces.

The soils of this unit are used mostly for woodland. About 40 percent of the acreage has been cleared and is used for pasture or row crops. The soils are well suited to row crops and to grasses and legumes. Flooding during winter and early in spring is the main limitation to the use of these soils for crops.

The soils of this unit are well suited to woodland.

These soils are severely limited for urban uses because of wetness and flooding.

The soils of this map unit have good potential for use as habitat for openland and woodland wildlife. For use as habitat for wetland wildlife, Gillsburg soils have fair potential, Oaklimeter soils have poor potential, and Ariel soils have very poor potential.

Nearly level to steep soils that are somewhat poorly drained to well drained

4. Kolin-Providence-Smithdale

Gently sloping to sloping, moderately well drained silty soils that have a clayey subsoil in the lower part, nearly level to strongly sloping, moderately well drained silty soils that have a fragipan, and strongly sloping to steep, well drained loamy soils; on uplands

These soils are mainly in the eastern half of Copiah County. The landscape is one of broad nearly level to gently sloping ridgetops, sloping to steep side slopes, and some narrow flood plains. Slopes range from 0 to 40 percent.

This unit makes up about 13 percent of the county. It is about 42 percent Kolin soils, 30 percent Providence soils, 20 percent Smithdale soils, and 8 percent minor soils.

Kolin soils are on ridgetops and side slopes. They are moderately well drained soils that formed in silty material and underlying clayey material.

Providence soils are on uplands and stream terraces. They are moderately well drained soils that have a fragipan formed in silty material and underlying loamy sediment.

Smithdale soils are on upland side slopes. They are well drained soils that formed in loamy material.

The minor soils are the moderately well drained Loring soils that have a fragipan and that are on uplands and stream terraces, the moderately well drained Lorman soils on upland side slopes, and the well drained Saffell soils on upland side slopes.

Most of the acreage of this map unit has been cleared and is used for pasture or cultivated crops. A small acreage is in woodland. The nearly level and gently sloping Providence soils on ridges and side slopes are well suited to row crops that are commonly grown in the county. The Kolin soils are suited to row crops and well suited to grasses and legumes for hay and pasture.

Severely eroded and strongly sloping to steep Smithdale soils are poorly suited to row crops. Steepness of slope and the hazard of erosion are the main limitations for row crops. Steep soils are also poorly suited to pasture.

The Kolin soils are suited to woodland and the Providence and Smithdale soils are well suited.

The Kolin soils are severely limited for urban uses because of the shrink-swell potential of the lower clayey part of the subsoil. Providence soils are moderately limited for these uses because of wetness. Smithdale soils are severely limited for urban uses because of steepness of slope.

These soils have good potential for use as habitat for openland wildlife where slopes are less than 17 percent and fair potential where slopes are greater. For the development of woodland wildlife habitat, the potential is good, and for wetland wildlife habitat, the potential is very poor.

5. Loring-Providence

Nearly level to strongly sloping, moderately well drained silty soils that have a fragipan; on uplands and stream terraces

These soils are throughout Copiah County. The landscape is one of gently sloping or nearly level ridgetops, sloping side slopes, and some strongly sloping side slopes that are dissected by short drainageways and by narrow flood plains. Slopes range from 0 to 12 percent.

This map unit makes up about 4 percent of the county. It is about 53 percent Loring soils, 33 percent Providence soils, and 14 percent minor soils.

Loring soils are on ridgetops and side slopes. They are moderately well drained soils that have a fragipan and that formed in silty material.

Providence soils are on ridgetops and side slopes. They are moderately well drained soils that have a fragipan and that formed in silty material and underlying loamy sediment.

The minor soils are the well drained Ariel soils on flood plains, the somewhat poorly drained Gillsburg soils on flood plains, the moderately well drained Kolin soils on uplands and terraces, the moderately well drained Lax soils that have a fragipan on ridges, and the well drained Smithdale soils on side slopes of uplands.

Most of the acreage of this map unit has been cleared and is used for pasture. A smaller acreage is in woodland. Some acreage where slopes are favorable is used for row crops commonly grown in the county. The nearly level and gently sloping soils on ridges and side slopes are well suited to row crops. Strongly sloping and severely eroded soils are poorly suited to row crops. The steepness of slope and the hazard of erosion are the main limitations for row crops. These soils are well suited to grasses and legumes for pasture and hay, except in severely eroded areas, which are moderately suited.

The soils of this map unit are well suited to woodland.

These soils are moderately limited for urban uses because of wetness. The fragipan limits the use of the soils for septic tank absorption fields.

These soils have good potential for use as habitat for openland and woodland wildlife and very poor potential for habitat for wetland wildlife.

6. Loring-Calloway

Nearly level to strongly sloping, moderately well drained and somewhat poorly drained silty soils that have a fragipan; on uplands and stream terraces

These soils are mainly in the northwestern section of Copiah County along Bayou Pierre and White Oak Creek. The landscape is nearly level to strongly sloping and is dissected by short drainageways and by narrow flood plains. Slopes range from 0 to 12 percent.

This map unit makes up about 3 percent of the county. It is about 67 percent Loring soils, 25 percent Calloway soils, and 8 percent minor soils.

Loring soils are on ridgetops and side slopes. They are moderately well drained soils that have a fragipan and that formed in silty material.

Calloway soils are on broad areas of uplands and stream terraces. They are somewhat poorly drained soils that have a fragipan and that formed in silty material.

The minor soils are the well drained Ariel soils on flood plains, the moderately well drained Grenada soils that have a fragipan and that are on uplands and stream terraces, and the poorly drained Guyton soils in low lying depressions and on stream terraces.

The soils of this map unit are used mostly for pasture and cultivated crops. A smaller acreage is in woodland. The nearly level and gently sloping soils are well suited to most row crops commonly grown in the county and well suited to grasses and legumes for pasture and hay. The strongly sloping Loring soils on side slopes are poorly suited to row crops. Because of the steepness of these soils, erosion is a severe hazard. The broad areas of nearly level Calloway soils are well suited to hay and pasture, but they may need surface drainage if cultivated crops are grown.

The soils of this map unit are well suited to woodland.

Loring soils of this unit are moderately limited for many urban uses because of wetness. Calloway soils are severely limited because of wetness. Both soils are limited for use as septic tank absorption fields because the fragipan restricts permeability.

The potential is good for habitat for openland and woodland wildlife. Loring soils have very poor potential for use as wetland wildlife habitat, and Calloway soils have poor potential.

7. Providence-Bude

Nearly level to strongly sloping, moderately well drained and somewhat poorly drained silty soils that have a fragipan; on uplands and stream terraces

These soils are mainly in the central part of the county on stream terraces and uplands along Bayou Pierre. The landscape is generally nearly level to strongly sloping but ranges to moderately steep. It has noticeable short drainageways and narrow flood plains. Slopes range from 0 to 12 percent.

This map unit makes up about 3 percent of the county. It is about 47 percent Providence soils, about 43 percent Bude soils, and 10 percent minor soils.

Providence soils are on the ridgetops and side slopes. They are moderately well drained soils that have a fragipan and that formed in a thin mantel of silty material and underlying loamy sediment.

Bude soils are on the stream terraces and uplands. They are somewhat poorly drained soils that have a fragipan and that formed in silty material and underlying loamy material.

The minor soils are the somewhat poorly drained Gillsburg soils on flood plains, the poorly drained Guyton soils in depressional flats and on stream terraces, the moderately well drained Kolin soils on terraces and uplands, and the moderately well drained Loring soils that have a fragipan and that are on uplands and terraces.

Most of the acreage of this map unit has been cleared and is used for pasture and cultivated crops. A small acreage is in woodland. The nearly level and gently sloping soils are well suited to most crops commonly grown in the county and well suited to grasses and legumes. The strongly sloping Providence soils on side slopes are poorly suited to row crops. If strongly sloping Providence soils are used for row crops, the steepness of slope causes an erosion hazard. Broad nearly level areas of Bude soils may need surface drainage, especially if cultivated.

The soils of this map unit are well suited to woodland.

These soils are moderately limited for urban uses because the fragipan limits the use of this soil for septic tank absorption fields. Wetness in some areas is a severe limitation for urban uses.

These soils have good potential for use as habitat for openland and woodland wildlife. Providence soils have very poor potential for use as wetland wildlife habitat, and Bude soils have fair potential.

Nearly level to steep soils that are moderately well drained to well drained

8. Loring-Smithdale

Nearly level to strongly sloping, moderately well drained silty soils that have a fragipan and strongly sloping to steep well drained loamy soils; on uplands

These soils are mainly in the western part of Copiah County. The landscape is one of sloping to steep hillsides and nearly level to gently sloping hilltops that are generally less than one-fourth of a mile wide. The area is dissected by many short drainageways and by narrow flood plains. Slopes range from 0 to 40 percent.

This map unit makes up about 7 percent of the county. It is about 50 percent Loring soils, 44 percent Smithdale soils, and 6 percent minor soils.

Loring soils are on the hilltops and the upper part of hillsides. They are moderately well drained soils that have a fragipan and that formed in silty material.

Smithdale soils are on hillsides. They are well drained soils that formed in loamy material.

The minor soils are the well drained Ariel soils on flood plains, the somewhat poorly drained Calloway soils that are on uplands and stream terraces, and the poorly drained Guyton soils that are in low depressional areas and on stream terraces. The well drained Memphis soils are on uplands.

Most of the acreage of this map unit has been cleared and is used for pasture and cultivated crops. A smaller area is in woodland. The nearly level and gently sloping Loring soils on ridges are well suited to row crops most commonly grown in the county and well suited to grasses and legumes. The strongly sloping to steep soils on hillsides are poorly suited to row crops. Steepness of slope and the hazard of erosion are the main limitations for row crops. Most other areas of Loring soils are well suited to pasture grasses and legumes. Smithdale soils on steep slopes are poorly suited.

These soils are well suited to woodland.

The Loring soils are moderately limited for urban use mainly because of wetness. Loring soils also have a fragipan that limits use for septic tank absorption fields because of restricted permeability. The steep Smithdale soils are severely limited for urban uses because of the slope.

Loring and Smithdale soils have good potential for use as habitat for woodland wildlife. They have a good potential for use as openland habitat except on slopes greater than 17 percent, where potential is fair. Potential for use as habitat for wetland wildlife is very poor.

9. Providence-Smithdale

Nearly level to strongly sloping, moderately well drained silty soils that have a fragipan and sloping to steep, well drained loamy soils; on uplands

These soils are mainly in the southwestern section of Copiah County. The landscape is one of strongly sloping to steep hillsides and nearly level to gently sloping hilltops that are generally less than one-fourth of a mile wide. The slopes are dissected by many short drainageways and by narrow flood plains. Slopes range from 0 to 40 percent.

The map unit makes up about 18 percent of the county. It is about 48 percent Providence soils, 41 percent Smithdale soils, and 11 percent minor soils.

Providence soils are on the hilltops and the upper part of hillsides. They are moderately well drained soils that have a fragipan and that formed in silty material and underlying loamy material.

Smithdale soils are on hillsides. They are well drained soils that formed in loamy material.

The minor soils are well drained Ariel soils and the somewhat poorly drained Gillsburg soils on flood plains, the moderately well drained Grenada soils that have a fragipan and that are on uplands and stream terraces, the moderately well drained Kolin soils on uplands and terraces, the moderately well drained Lax soils that have a fragipan and that are on upland ridgetops, and the well drained Saffell soils on upland side slopes.

The soils of this unit are used mostly for pasture. Some of the acreage is in woodland. A moderate acreage where slopes are favorable is in row crops. The nearly level and gently sloping soils are well suited to row crops commonly grown in the county and well suited to grasses and legumes. The strongly sloping to steep soils on hillsides are poorly suited. Steepness of slope and hazard of erosion are the main limitations for row crops. Most other areas of Providence soils are well suited to pasture grasses and legumes. The steep Smithdale soils are poorly suited.

The soils of this map unit are well suited to use as woodland.

The Providence soils of this map unit have moderate limitations for urban uses, mainly wetness. They also have a fragipan that limits the use of the soils for septic tank absorption fields because of restricted permeability. The steep Smithdale soils are severely limited for urban uses because of the slope.

The Providence and Smithdale soils have good potential for use as habitat for woodland wildlife. They have good potential for use as openland habitat except on slopes greater than 17 percent, where potential is fair. Potential for use as habitat for wetland wildlife is very poor.

10. Providence-Smithdale-Saffell

Nearly level to strongly sloping, moderately well drained silty soils that have a fragipan and strongly sloping to steep, well drained loamy and gravelly soils; on uplands

These soils are mainly in the eastern half of Copiah County. The landscape is hilly and marked by narrow nearly level to gently sloping hilltops that are generally less than one-eighth of a mile wide, by steep hillsides that are dissected by many short drainageways, and by intermittent streams and narrow flood plains. Slopes range from 0 to 40 percent.

This map unit makes up about 8 percent of the county. It is about 37 percent Providence soils, 25 percent Smithdale soils, 16 percent Saffell soils, and 12 percent minor soils.

Providence soils are on the narrow hilltops and the upper part of hillsides. They are moderately well drained soils that have a fragipan and that formed in silty material and underlying loamy material.

Smithdale soils are on hillsides. They are well drained soils that formed in loamy material.

Saffell soils are on hillsides. They are well drained soils that formed in gravelly loamy and sandy materials.

The minor soils are the well drained Ariel soils on flood plains, the moderately well drained Kolin soils on terraces and uplands, the moderately well drained Lax soils that have fragipans on upland ridgetops, the moderately well drained Lorman soils on upland side slopes, and the moderately well drained Loring soils that have a fragipan on uplands and stream terraces.

The soils of this unit are used mostly as woodland. Some acreage in areas where the slopes are favorable is in pasture. The nearly level and gently sloping Providence soils on ridges are well suited to row crops most commonly grown in the county and well suited to grasses and legumes. The strongly sloping to steep soils on hilly areas are poorly suited to row crops. The steepness of slope and hazard of erosion are the main limitations for crops. Most other areas of Providence soils are well suited to grasses and legumes. Smithdale and Saffell soils on steep hillsides are poorly suited.

Providence and Smithdale soils are well suited to woodland and Saffell soils are poorly suited.

Some areas of this unit have moderate limitations for urban uses, but most of the unit is severely limited because of the steepness of slope.

Providence and Smithdale soils have good potential for woodland wildlife habitat and very poor potential for wetland wildlife habitat. They have good potential for use as habitat for openland wildlife except on slopes greater than 17 percent, where potential is fair. Saffell soils have fair potential for woodland wildlife habitat. They have fair potential for openland habitat, except on slopes greater than 17 percent, where potential is poor. Saffell soils have very poor potential for wetland wildlife habitat.

11. Lorman-Smithdale

Strongly sloping to steep, moderately well drained and well drained loamy soils; on uplands

These soils are throughout Copiah County. The landscape is hilly and characterized by narrow hilltops that are generally less than one-eighth mile wide and by steep hillsides that are dissected by many short drainageways. Narrow flood plains extend into this map unit. Slopes range from 8 to 40 percent.

The map unit makes up about 14 percent of the county. It is about 43 percent Lorman soils, 37 percent Smithdale soils, and 20 percent minor soils.

Lorman soils are generally on the middle and lower parts of the hillsides. They are moderately well drained loamy soils that have a clayey subsoil.

Smithdale soils are generally on the upper and middle parts of the hillsides. They are well drained soils that formed in loamy material.

The minor soils are the well drained Ariel soils and the somewhat poorly drained Gillsburg soils that are on flood plains, the moderately well drained Kolin soils on terraces and uplands, the moderately well drained Loring and Providence soils that have a fragipan and that are on uplands and stream terraces, the well drained Saffell soils on upland side slopes, and the excessively drained loamy sands on the ridgetops and side slopes.

The soils of the unit are used mostly as woodland. Some areas where slopes are favorable are used for pasture. The soils of this unit are poorly suited to row crops, grasses and legumes, and pasture. Steep slopes and the hazard of erosion are the main limitations to cultivation.

The Lorman soils are suited to woodland, and the Smithdale soils are well suited.

Because of the steep slopes and high shrink-swell potential of the clays, most of these soils are severely limited for urban uses.

The Lorman soils have good potential for use as habitat for openland wildlife, and the Smithdale soils have fair potential. These soils have good potential for use as habitat for woodland wildlife and very poor potential for wetland habitat.

12. Smithdale-Lexington

Sloping to steep, well drained loamy soils and well drained silty soils; on uplands

These soils are mainly in the northwestern section of Copiah County. The landscape is hilly. It has narrow sloping hilltops that generally are less than one-eighth of a mile wide and has steep hillsides that are dissected by many short drainageways and narrow flood plains. Slopes range from 5 to 40 percent.

This map unit makes up about 6 percent of the county. It is about 44 percent Smithdale soils, 22 percent Lexington soils, and 34 percent minor soils.

Smithdale soils are on the hillsides. They are well drained soils that formed in loamy material.

Lexington soils are on hilltops and the upper part of hillsides. They are well drained soils that formed in a silty mantel and underlying loamy sediment.

The minor soils are the well drained Ariel soils on flood plains, the moderately well drained Kolin soils on uplands and terraces, the moderately well drained Loring soils that have a fragipan and that are on uplands and terraces, the moderately well drained Lorman soils on hillsides, the well drained Memphis soils on uplands, the moderately well drained Oaklimeter soils on flood plains, and the well drained Saffell soils on hillsides.

The soils of this map unit are used mostly as woodland. Some areas where slopes are favorable are in pasture. The soils of this map unit are poorly suited to cultivated crops and poorly suited to grasses and legumes. Steep slopes and the hazard of erosion are the main limitations for crops.

The soils of this map unit are well suited to woodland.

The soils of this map unit are severely limited for urban uses because of steepness of slope.

The Smithdale soils have fair potential for use as habitat for openland wildlife, and Lexington soils have good potential. These soils have good potential for use as habitat for woodland wildlife and very poor potential for use as habitat for wetland wildlife.

Detailed soil map units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Providence silt loam, 0 to 2 percent slopes, is one of several phases in the Providence series.

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

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. Lorman-Smithdale 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.

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.

Descriptions of the detailed soil map units follow.

Ae—Ariel silt loam. This nearly level, well drained soil formed in silty materials on broad flood plains. This soil is occasionally flooded for very brief periods in winter and early in spring. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The upper part of the subsoil, to a depth of 27 inches, is dark yellowish brown silt loam that has pale brown mottles. The middle part, to a depth of 42 inches, is mottled pale brown, yellowish brown, and light brownish gray silt loam. The lower part of the subsoil to a depth of 64 inches is silt loam mottled in shades of gray and brown.

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. Available water capacity is high. Runoff is slow, and erosion is a slight hazard. The high water table is 2 to 3 feet below the surface in winter and early in spring. The surface layer is friable and easily tilled throughout a wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are a few small areas of somewhat poorly drained Gillsburg soils and moderately well drained Oaklimeter soils, which are on lower positions on the flood plain.

Most areas of this Ariel soil are used as pasture or woodland. A small acreage is used for crops. This soil is well suited to cotton, corn, soybeans, and small grains. Proper row arrangement and surface field ditches are needed to remove excess surface water. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

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 help keep the soil in good condition.

This soil is well suited to cherrybark oak, yellow-poplar, water oak, sweetgum, loblolly pine, and eastern cottonwood. The erosion hazard, equipment use limitation, and seedling mortality are slight. Plant competition is moderate.

This soil is severely limited for urban uses because of flooding. Flooding, wetness, and moderately slow permeability of the lower part of the subsoil are severe limitations to the use of this soil as septic tank absorption fields.

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

Ar—Arkabutla silt loam. This nearly level, somewhat poorly drained soil formed in silty alluvium in narrow depressional areas of broad flood plains. This soil is subject to frequent flooding for long periods during winter and early in spring. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown silt loam about 5 inches thick that has pale brown mottles. The upper part of the subsoil is mottled dark yellowish brown and light brownish gray silt loam to a depth of about 18 inches. The middle part, to a depth of about 48 inches, is light brownish gray silty clay loam that has yellowish brown mottles. The lower part of the subsoil to a depth of 70 inches is light brownish gray silt loam that has yellowish brown mottles.

This soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Water and air move through this soil at a moderate rate, and runoff is slow. Erosion is a slight hazard. Available water capacity is high. The high water table is 1 1/2 to 2 1/2 feet below the surface in winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually packs and crusts after hard rains.

Included in mapping are small areas of poorly drained Guyton soils and other areas of poorly drained soils that have a silty clay loam subsoil. These are in narrow depressional areas.

Most of the acreage of this Arkabutla soil is in woodland. A few areas are used for row crops and pasture. This soil is poorly suited to row crops because of frequent flooding. Corn, cotton, soybeans, and small grains are commonly grown crops. Proper row arrangement and surface field ditches are needed to remove surface water. Conservation tillage and returning crop residue to the soil reduces crusting, improves tilth, and increases fertility.

This soil is well suited to grasses and legumes for pasture or hay. Overgrazing or grazing when the soil is too wet will cause surface compaction and poor tilth. Proper stocking, weed and brush control, and restricting grazing during wet weather help to maintain pasture and to keep the soil in good condition.

This soil is well suited to cherrybark oak, eastern cottonwood, green ash, loblolly pine, Nuttall oak, sweetgum, American sycamore, water oak, and eastern cottonwood. Erosion is a slight hazard during logging operations; equipment use limitations are moderate if the tree crop is harvested during wet weather. Seedling mortality and plant competition are moderate.

Flooding, wetness, and low strength for streets and roads are severe limitations for urban uses. Flooding and wetness also are severe limitations to the use of this soil as septic tank absorption fields.

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

Br—Bruno sandy loam. This nearly level to very gently sloping, excessively drained soil formed in sandy alluvium on flood plains. This soil is frequently flooded for brief periods in winter and early in spring. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark brown sandy loam about 7 inches thick. The upper part of the underlying material is brown loamy sand that has strata of dark grayish brown loamy fine sand to a depth of 13 inches. The middle part, to a depth of 50 inches, is pale brown loamy sand that has thin dark yellowish brown strata. The lower part of the underlying material to a depth of 70 inches is pale brown sand.

This soil ranges from very strongly acid to medium acid throughout except where the surface has been limed. Permeability is rapid. Available water capacity is low. Runoff is slow, and erosion is a slight hazard. The high water table is at a depth of 4 to 6 feet in winter and early in spring.

Included in mapping are small areas of well drained Ariel and Latonia soils, which are on lower positions on the flood plains.

Most areas of this Bruno soil are used as woodland. A small acreage is in pasture. This soil is poorly suited to row crops because of frequent flooding.

This soil is poorly suited to grasses and legumes for hay and pasture. This soil is frequently flooded, and, in addition, it is too sandy and droughty for most grasses and legumes.

This soil is well suited to water oak, sweetgum, cherrybark oak, willow oak, river birch, sycamore, and eastern cottonwood (fig. 1). Limitations for woodland use are moderate because of frequent flooding, seedling mortality, and plant competition.

Flooding is a severe limitation for all urban uses. Flooding and coarse textured soil material, which does not filter effluent sufficiently, are severe limitations to the use of this soil as septic tank absorption fields.

This Bruno soil is in capability subclass Vw and in woodland suitability group 2s5.

BuA—Bude silt loam, 0 to 2 percent slopes. This somewhat poorly drained soil, which has a fragipan,

Figure 1.—Cottonwood plantation on Bruno sandy loam.

formed in silty materials over loamy material on broad nearly level uplands and stream terraces.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The upper part of the subsoil, to a depth of 18 inches, is silt loam mottled in shades of brown, yellow, and gray. The lower part of the subsoil to a depth of 64 inches is a silt loam fragipan mottled in shades of brown, gray, and yellow.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. Runoff is slow, and erosion is a slight hazard. A high water table is perched above the fragipan at a depth 1/2 foot to 1 1/2 feet in the winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of well drained Ariel soils and somewhat poorly drained Gillsburg soils on narrow flood plains and moderately well drained Providence soils on slightly higher positions.

Most areas of this Bude soil are used for crops and pasture. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. Conservation tillage, grassed waterways, and proper row arrangement are needed. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

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

This soil is well suited to cherrybark oak, southern red oak, loblolly pine, shortleaf pine, sweetgum, water oak, and white oak. Wetness is a moderate limitation in harvesting the trees and in the use of equipment. Plant competition is also moderate.

This soil is severely limited for urban uses because of wetness. The low strength of the soil is a severe limitation for streets and roads. Proper design and construction will help overcome these limitations. The slow permeability of the fragipan and the seasonal high water table are severe limitations to the use of this soil as septic tank absorption fields.

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

CaA—Cahaba sandy loam, 0 to 2 percent slopes. This well drained soil formed in loamy and sandy material on broad nearly level stream terraces along the Pearl River.

Typically, the surface layer is dark brown sandy loam about 6 inches thick. The upper part of the subsoil, to a depth of 14 inches, is reddish brown sandy loam. The middle part, to a depth of 35 inches, is yellowish red sandy clay loam that has brownish mottles. The lower part of the subsoil, to a depth of 46 inches, is a strong brown sandy loam. The underlying material to a depth of 80 inches is light yellowish brown loamy sand.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is moderate. Runoff is slow, and erosion is a slight hazard. The high water table is below a depth of 6 feet. The surface layer is friable and easily tilled throughout a wide range of moisture content.

Included in mapping are small areas of moderately well drained Columbus soils on lower positions on the landscape, well drained Latonia soils on narrow ridges, and well drained soils on lower positions that occasionally flood.

Most areas of this Cahaba soil are used for crops and pasture. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. Conservation tillage, proper row arrangement, and grassed waterways help control erosion on cultivated fields (fig. 2). Returning crop residue to the soil increases fertility and improves tilth as well as reduces crusting.

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. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, slash pine, sweetgum, yellow-poplar, southern red oak, white oak, cherrybark oak, and American sycamore. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

This soil has slight limitations for most urban uses. However, limitations are severe for use of this soil as septic tank absorption fields. Sewage effluent is rapidly dispersed, but it may be poorly filtered in the loamy sand substratum and cause pollution of nearby streams.

Figure 2.—Contour strip farming on Cahaba sandy loam, 0 to 2 percent slopes.

This Cahaba soil is in capability class I and in woodland suitability group 2o7.

CaB—Cahaba sandy loam, 2 to 5 percent slopes. This well drained soil formed in loamy and sandy material on gently sloping stream terraces along the Pearl River.

Typically, the surface layer is brown sandy loam about 7 inches thick. The upper part of the subsoil, to a depth of 25 inches, is reddish brown clay loam. The lower part of the subsoil, to a depth of 38 inches, is yellowish red sandy clay loam. The underlying material to a depth of 70 inches is light yellowish brown loamy sand.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is moderate. Runoff is medium to slow. Erosion is a moderate hazard. The high water table is below a depth of 6 feet. The surface layer is friable and easily tilled throughout a wide range of moisture content.

Included in mapping are small areas of moderately well drained Columbus soils and well drained Latonia soils that are on similar positions.

Most areas of this Cahaba soil are used for crops and pasture. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. Conservation tillage, crop rotation, terraces, grassed waterways, and contour farming are needed to control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility and reduces crusting.

This soil is well suited to grasses and legumes for hay and pasture. The use of the soil for hay and pasture is effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, slash pine, sweetgum, yellow-poplar, southern red oak, white oak, cherrybark oak, and American sycamore. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

This soil has slight limitations for most urban uses. However, limitations are severe for use of this soil as septic tank absorption fields. Sewage effluent is rapidly dispersed, but it may be poorly filtered in the loamy sand substratum and cause pollution of nearby streams.

This Cahaba soil is in capability subclass IIe and in woodland suitability group 2o7.

CoA—Calloway silt loam, 0 to 2 percent slopes. This somewhat poorly drained soil, which has a fragipan, formed in silty material on broad nearly level uplands and stream terraces.

Typically, the surface layer, about 6 inches thick, is dark grayish brown silt loam that has pale brown mottles. The upper part of the subsoil, to a depth of 20 inches, is yellowish brown silt loam mottled in shades of gray. The lower part of the subsoil to a depth of 64 inches is a fragipan of silt loam mottled in shades of brown and gray.

Except where the surface has been limed, this soil ranges from very strongly acid to medium acid in the surface layer and upper part of the subsoil, and strongly acid to neutral in the lower part. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. A high water table is perched above the fragipan at a depth 1 foot to 2 feet during the winter and early in spring. The surface layer is friable and easily tilled throughout a wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of moderately well drained Grenada and Providence soils, which are on higher positions on the landscape.

Most areas of this Calloway soil are used for pasture or crops. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. Proper row arrangement and surface field ditches help to remove excess surface water. Conservation tillage, contour farming, and grassed waterways will help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces surface compaction.

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. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, sweetgum, water oak, willow oak, shortleaf pine, and loblolly pine. The erosion hazard and seedling mortality are slight. Use of equipment is moderately limited during wet weather in winter and early in spring. Plant competition is moderate.

This soil is severely limited for most urban uses because of wetness. The low strength of the soil is a severe limitation for local roads and streets. Proper design and construction will help overcome these limitations. The slow permeability of the fragipan and wetness severely limit the use of this soil as septic tank absorption fields.

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

CuA—Columbus silt loam, 0 to 2 percent slopes. This is a moderately well drained soil that formed in loamy material on broad nearly level stream terraces.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil to a depth of 18 inches is dark brown clay loam. Between depths of 18 and 23 inches, the subsoil is yellowish brown clay loam that has light brownish gray mottles. Between depths of 23 and 35 inches, it is mottled yellowish brown, light brownish gray, and strong brown sandy clay loam. Between depths of 35 and 42 inches, it is mottled yellowish brown, light brownish gray, and pale brown sandy loam. The underlying material to a depth of 75 inches is a yellowish brown loamy sand.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is moderate. Runoff is slow, and erosion is a slight hazard. The water table is 2 to 3 feet below the surface in the winter and early in spring. The surface layer is friable and easily tilled throughout a wide range of moisture content.

Included in mapping are small areas of somewhat poorly drained Arkabutla soils, well drained Cahaba soils, and poorly drained Guyton soils. Arkabutla and Guyton soils are in small depressional areas, and Cahaba soils are on higher narrow ridges.

Most areas of this Columbus soil are used for pasture and crops. A small acreage is in woodland. This soil is well suited to soybeans, cotton, corn, and small grains. Conservation tillage, grassed waterways, and surface field ditches help control erosion on cultivated fields. Proper row arrangement and surface field ditches help remove excess surface water. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

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. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, sweetgum, water oak, and yellow-poplar. The erosion hazard, seedling mortality, and plant competition are slight. In wet weather, equipment use limitations are moderate.

This soil is moderately limited for urban uses because of wetness. The low strength of the soil is an additional limitation for streets and roads. Proper design and construction will help overcome these limitations. The high water table and wetness are severe limitations to the use of this soil as septic tank absorption fields.

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

Gb—Gillsburg silt loam. This nearly level, somewhat poorly drained soil formed in silty alluvium on broad flood plains. This soil is subject to occasional flooding for brief periods in winter and early in spring. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsoil to a depth of 14 inches is brown silt loam mottled with pale brown. Between depths of 14 and 26 inches, the subsoil is light brownish gray silt loam mottled with yellowish brown. Below that, to a depth of 34 inches, it is grayish brown silt loam mottled with yellowish brown. Between depths of 34 and 64 inches, it is gray silt loam mottled with yellowish brown.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is high. Runoff is slow, and erosion is a slight hazard. The high water table is 1 foot to 1 1/2 feet below the surface in winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of well drained Ariel soils, somewhat poorly drained Bude soils, and moderately well drained Oaklimeter soils. Ariel and Oaklimeter soils are on higher positions on flood plains, and Bude soils are on low stream terraces.

Most areas of this Gillsburg soil are used as pasture or woodland. A small acreage is used for crops. This soil is well suited to cotton, corn, soybeans, and small grains. Proper row arrangement and surface field ditches are needed to remove excess surface water. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

The 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. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to eastern cottonwood, cherrybark oak, green ash, sweetgum, American sycamore, water oak, yellow-poplar, and loblolly pine. During wet weather, this soil has moderate equipment use limitations in harvesting of trees. Tree seeds, cuttings, and seedlings survive and grow well if competing vegetation is controlled or removed.

This soil is severely limited for urban uses because of flooding and wetness. Flooding and wetness also are severe limitations to the use of this soil as septic tank absorption fields.

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

GrA—Grenada silt loam, 0 to 2 percent slopes. This moderately well drained soil, which has a fragipan, formed in silty materials on broad nearly level uplands and stream terraces.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The upper part of the subsoil to a depth of about 16 inches, is yellowish brown silt loam. The middle part, to a depth of about 22 inches, is yellowish brown silt loam mottled with brownish yellow. The lower part of the subsoil to a depth of 64 inches is a fragipan. In the upper 27 inches the fragipan is mixed pale brown and yellowish brown silt loam, and below that it is silt loam mottled in shades of brown and gray.

This soil ranges from very strongly acid to medium acid in the surface layer and upper part of the subsoil except where the surface has been limed. The lower part of the subsoil ranges from strongly acid to medium acid. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. Runoff is slow, and erosion is a slight hazard. A high water table is perched above the fragipan at a depth 1 1/2 to 2 1/2 feet during the winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of soils on uplands and terraces that have a sandy texture below a depth of 30 to 48 inches. Also included are small areas of somewhat poorly drained Calloway soils and moderately well drained Loring soils and Providence soils. These soils are at the same elevation as the Grenada soil. A few areas of soils that are gently sloping are included also.

Most areas of this Grenada soil are used for crops and pasture. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. Conservation tillage, terracing, vegetated waterways, and row arrangement help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves tilth, and reduces crusting.

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. Management concerns include proper stocking, controlled grazing, and weed and brush control.

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

This soil is moderately limited for urban uses because of seasonal wetness. Low strength is a severe limitation for local roads and streets. Proper design and construction will help overcome these limitations. The wetness and the slow permeability of the fragipan are severe limitations to the use of this soil as septic tank absorption fields.

This Grenada soil is in capability subclass IIw and in woodland suitability group 2o7.

Gu—Guyton silt loam. This level, poorly drained soil formed in silty material on broad to depressional flats and stream terraces. This soil is subject to frequent flooding for brief periods in winter and early in spring. Slopes range from 0 to 1 percent.

Typically, the surface layer, about 4 inches thick, is light brownish gray silt loam mottled with yellowish brown. The subsurface layer, to a depth of 19 inches, is light gray silt loam mottled with yellowish brown and strong brown. The subsoil to a depth of 29 inches is a mixed light gray, strong brown, and yellowish brown silt loam. Between depths of 29 and 50 inches, the subsoil is light brownish gray silt loam. Between depths of 50 and 58 inches, it is light brownish gray silt loam mottled with yellowish brown and strong brown. Below that, to a depth of 77 inches, it is light brownish gray clay loam mottled with strong brown.

This soil is very strongly acid or strongly acid in the surface layer and upper parts of the subsoil except where the surface has been limed, and strongly acid to neutral in the lower parts of the subsoil. Permeability is slow. Available water capacity is high. Runoff is slow, and erosion is a slight hazard. A high water table fluctuates between the surface and a depth of 1 1/2 feet. Root development is somewhat restricted early in spring because of the water table.

Included in mapping are small areas of somewhat poorly drained Arkabutla soils in narrow depressions and moderately well drained Columbus soils on higher terrace positions. Also included, on landscape positions similar to those of this Guyton soil, are a few areas of poorly drained soils that have high concentrations of sodium in the upper part of the subsoil.

Most areas of this soil are used as woodland. A small acreage is in pasture. This soil is poorly suited to row crops and small grains because of frequent flooding.

This soil is poorly suited to grasses and legumes for hay and pasture because of reduced productivity caused by frequent flooding (fig. 3). Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to sweetgum, green ash, water oak, willow oak, southern red oak, and loblolly pine. Flooding and wetness are severe limitations to the use of equipment on this soil. Plant competition is also severe.

This soil is severely limited for urban uses because of flooding and wetness. The low strength of the soil is a severe limitation for local roads and streets. This soil is severely limited for use as septic tank absorption fields because of flooding, wetness, and the slow permeability of the subsoil.

This Guyton soil is in capability subclass Vw and in woodland suitability group 2w9.

KoB2—Kolin silt loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil formed in silty material and underlying clayey sediment on broad terraces and uplands.

Typically, the surface layer is brown silt loam about 7 inches thick. The upper part of the subsoil, to a depth of 26 inches, is strong brown silt loam. The middle part, to a depth of 34 inches, is strong brown silt loam mottled with light brownish gray. The lower part of the subsoil, to a depth of 67 inches, is strong brown silty clay mottled with gray. The underlying material to a depth of 75 inches is light brownish gray silty clay mottled with yellowish brown.

In most places, the original surface layer of this soil has been removed by erosion, and tillage has mixed

Figure 3.—Drainageway in an area of Guyton silt loam, which is frequently flooded in winter and early in spring.

topsoil and subsoil together. In places, all of the plow layer is the original topsoil, and in other places, the plow layer is essentially in the subsoil. Some areas have a few rills and shallow gullies.

The surface layer ranges from very strongly acid to slightly acid except where the surface has been limed. The upper part of the subsoil ranges from very strongly acid to medium acid. Reaction in the lower part of the subsoil and in the underlying material ranges from very strongly acid to slightly acid. Permeability is moderately slow in the silt loam material and very slow in the clayey material. Available water capacity is high. Runoff is medium, and erosion is a moderate hazard. A high water table is perched above the clayey material and is 1/2 to 3 feet below the surface during the winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of moderately well drained Lorman and Providence soils and well drained Smithdale soils on the same uplands as this Kolin soil.

Most areas of this Kolin soil are used as pasture and woodland. A small acreage is used for crops. This soil is suited to corn, soybeans, and small grains. Conservation tillage, grassed waterways, terracing, and contour farming help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves tilth, and reduces crusting.

This soil is well suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is suited to loblolly pine, shortleaf pine, sweetgum, and water oak. The erosion hazard and seedling mortality are slight. Equipment use limitations and plant competition are moderate.

This soil is severely limited for most urban uses because of wetness and the shrink-swell potential of the clayey subsoil. The low strength of the soil is a severe limitation for local roads and streets. Wetness and the very slow permeability in the clayey subsoil are severe limitations to the use of this soil as septic tank absorption fields.

This Kolin soil is in capability subclass IIIe and in woodland suitability group 3w7.

KoC2—Kolin silt loam, 5 to 8 percent slopes, eroded. This sloping, moderately well drained soil formed in silty material and underlying clayey sediment on broad terraces and uplands.

Typically, the surface layer is brown silt loam about 6 inches thick. The upper part of the subsoil, to a depth of 26 inches, is strong brown silt loam. The middle part, to a depth of 38 inches, is strong brown silt loam mottled with light brownish gray. The lower part of the subsoil to a depth of 70 inches is mottled, strong brown, gray, and yellow silty clay.

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

The surface layer ranges from very strongly acid to slightly acid except where the surface has been limed. The upper part of the subsoil ranges from very strongly acid to medium acid. Reaction in the lower part of the subsoil and in the underlying material ranges from very strongly acid to slightly acid. Permeability is moderately slow in the silt loam material and very slow in the clayey material. Available water capacity is high. Runoff is medium, and erosion is a moderate hazard. A high water table is perched above the clayey material and is 1 1/2 to 3 feet below the surface during winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but usually crusts and packs after hard rains.

Included in mapping are small areas of moderately well drained Lorman and Providence soils and well drained Smithdale soils on the same uplands as this Kolin soil.

Most areas of this Kolin soil are used for pasture or as woodland. A small acreage is used for crops. This soil is poorly suited to crops and small grains because of the hazard of erosion. Conservation tillage, grassed waterways, terracing, and contour farming will help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

This soil is well suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is suited to loblolly pine, shortleaf pine, water oak, and sweetgum. The erosion hazard and seedling mortality are slight. Equipment use limitations and plant competition are moderate.

This soil is severely limited for most urban uses because of wetness and the shrink-swell potential of the clayey subsoil. The low strength of the soil is a severe limitation for local roads and streets. Wetness and the very slow permeability in the clayey subsoil are severe limitations to the use of this soil as septic tank absorption fields.

This Kolin soil is in capability subclass IVe and in woodland suitability group 3w7.

LaB—Latonia loamy sand, 0 to 5 percent slopes. This nearly level to gently sloping, well drained soil formed in sandy sediments on the natural levees of the Pearl River flood plains. This soil is subject to occasional flooding under abnormally high rainfall in winter and early in spring.

Typically, the surface layer is dark brown loamy sand about 8 inches thick. The subsoil, which extends to a depth of about 45 inches, is yellowish brown sandy loam. The underlying material to a depth of 80 inches is pale brown loamy sand.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is rapid in the surface layer and moderately rapid in the subsoil. Available water capacity is moderate. Runoff is medium to slow, and erosion is a slight hazard. The water table is below a depth of 6 feet. The surface layer is friable and easily tilled throughout a wide range of moisture content. The soil is droughty and fertilizer leaches easily; frequent applications are needed.

Included in mapping are small areas of excessively drained Bruno soils and well drained Cahaba soils. Bruno soils are in depressional areas, and Cahaba soils are on broad terraces.

Most areas of this Latonia soil are used for crops or as woodland. A small acreage is used for pasture. This soil is well suited to corn, soybeans, and small grains. Conservation tillage and grassed waterways help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility and increases organic matter content.

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

This soil is well suited to loblolly and shortleaf pines. Woodland management limitations are slight.

This soil is severely limited for most urban uses because of occasional flooding. The occasional flooding and coarse textured soil material, which does not filter effluent sufficiently, are severe limitations to the use of this soil as septic tank absorption fields.

This Latonia soil is in capability subclass IIs and in woodland suitability group 2o1.

LbB2—Lax silt loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil, which has a fragipan, formed in a mantle of silty material and underlying gravel deposits on upland ridgetops.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The upper part of the subsoil, to a depth of 19 inches, is strong brown silty clay loam. The middle part, to a depth of 25 inches, is strong brown silty clay loam mottled with light yellowish brown. The lower part of the subsoil to a depth of 64 inches is a fragipan that is strong brown mottled in shades of brown and gray; it is gravelly silt loam to a depth of 34 inches and gravelly sandy clay loam below.

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

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. Runoff is medium, and erosion is a moderate hazard. A high water table is perched above the fragipan and is 1 1/2 to 2 1/2 feet below the surface during winter and early in spring. The surface layer is friable and easily tilled throughout a wide range of moisture content, but usually crusts and packs after hard rains.

Included in mapping are small areas of moderately well drained Providence soils and well drained Saffell soils on the same elevation on the uplands.

Most areas of this Lax soil are used for crops and pasture. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. Conservation tillage, grassed waterways, and contour farming help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

This soil is well suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is also effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, shortleaf pine, and southern red oak. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

This soil is moderately limited for urban uses because of seasonal wetness. Low strength is a severe limitation for local roads and streets. The slow permeability of the gravelly fragipan and wetness are severe limitations to the use of this soil as septic tank absorption fields.

This Lax soil is in capability subclass IIe and in woodland suitability group 2o7.

LoA—Loring silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil, which has a fragipan, formed in silty material on broad stream terraces and uplands.

Typically, the surface layer is brown silt loam about 7 inches thick. The upper part of the subsoil, to a depth of 21 inches, is dark brown silty clay loam that has a few yellowish mottles in the lower part. The lower part of the subsoil to a depth of 68 inches is a brown silt loam fragipan that has mottles in shades of gray and yellow.

This soil ranges from very strongly acid to medium acid throughout except where the surface has been limed. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is slow, and erosion is a slight hazard. A perched water table is above the fragipan and is 2 to 3 feet below the surface during the winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of somewhat poorly drained Calloway soils, moderately well drained Grenada soils, and well drained Memphis soils. Calloway and Grenada soils are in depressions, and Memphis soils are on narrow gently sloping ridges.

Most areas of this Loring soil are used for pasture or crops. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. The nearly level slopes cause some wetness on these soils. Proper row arrangement and grassed waterways will help control erosion and wetness on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

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. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, southern red oak, loblolly pine, shortleaf pine, sweetgum, water oak, willow oak, and white oak. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is severe.

This soil is moderately limited for urban uses because of wetness. Low strength is a severe limitation for local streets and roads. The moderately slow permeability of the fragipan and wetness severely limit the use of this soil as septic tank absorption fields.

This Loring soil is in capability subclass IIw and in woodland suitability group 2o7.

LoB2—Loring silt loam, 2 to 5 percent slopes, eroded. This moderately well drained, gently sloping soil, which has a fragipan, formed in silty material on broad stream terraces and ridgetops on uplands.

Typically, the surface layer is brown silt loam about 7 inches thick. The upper part of the subsoil, to a depth of 23 inches, is strong brown silty clay loam. The lower part of the subsoil to a depth of 68 inches is a strong brown silt loam fragipan mottled in shades of brown, yellow, and gray.

In most places, part of the original surface layer has been removed by erosion, and tillage has mixed topsoil and subsoil together. In some places, all of the plow layer is the original topsoil, and in other places, the plow layer is essentially in 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 has been limed. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is medium, and erosion is a moderate hazard. A high water table is perched above the fragipan and is 2 to 3 feet below the surface during the winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of moderately well drained Grenada soils and well drained Memphis soils. Grenada soils are in small depressional areas; Memphis soils are on the narrow higher ridges.

Most areas of this Loring soil are used for pasture or crops. A small acreage is in woodland. This soil is well suited to row crops including cotton, corn, soybeans, and small grains. Conservation tillage (fig. 4), grassed waterways, and contour farming help control erosion on cultivated fields. Returning crop residue to the soil helps to maintain soil fertility and soil tilth and reduces crusting.

This soil is well suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, loblolly pine, shortleaf pine, sweetgum, southern red oak, water oak, willow oak, and white oak. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is severe.

This soil is moderately limited for urban uses because of wetness. Low strength is a severe limitation for local streets and roads. Proper design and construction will help overcome these limitations. The moderately slow permeability of the fragipan and wetness severely limit the use of this soil as septic tank absorption fields.

This Loring soil is in capability subclass IIe and in woodland suitability group 2o7.

LoC2—Loring silt loam, 5 to 8 percent slopes, eroded. This moderately well drained, sloping soil, which has a fragipan, formed in silty material on the uplands.

Typically, the surface layer is brown silt loam about 5 inches thick. The upper part of the subsoil, to a depth of 25 inches, is dark brown silty clay loam. The lower part to a depth of 70 inches is a brown silt loam fragipan that has mottles in shades of yellow and gray.

In most places, part of the original surface layer has been removed by erosion, and tillage has mixed the topsoil and subsoil together. In some places, all of the plow layer is the original topsoil, and in other places, the plow layer is essentially in 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 has been limed. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is medium, and erosion hazard is moderate. A high water table is perched above the fragipan at a depth of 2 to 3 feet in winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of well drained Smithdale soils that are on narrow steeper side slopes.

Most areas of this Loring soil are used for pasture or crops. A small acreage is in woodland. This soil is suited to cotton, corn, soybeans, and small grains. Conservation tillage, grassed waterways, terracing, and contour farming help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

This soil is well suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is also effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, loblolly pine, shortleaf pine, sweetgum, southern red oak, water oak, willow oak, and white oak. The erosion hazard,

Figure 4.—Tillage was minimized by planting soybeans in wheat stubble on Loring silt loam, 2 to 5 percent slopes, eroded.

equipment use limitation, and seedling mortality are slight, plant competition is severe.

This soil is moderately limited for urban uses because of wetness. Steepness of slope is a moderate limitation for small commercial buildings. Low strength is a severe limitation to the use of this soil as a site for local roads and streets. Proper design and construction will help overcome these limitations. The moderately slow permeability of the fragipan and wetness severely limit the use of this soil as septic tank absorption fields.

This Loring soil is in capability subclass IIIe and in woodland suitability group 2o7.

LoD2—Loring silt loam, 8 to 12 percent slopes, eroded. This is a moderately well drained, strongly sloping soil that has a fragipan. It formed in silty material on uplands.

Typically, the surface layer is a brown silt loam about 6 inches thick. The upper part of the subsoil, to a depth of 25 inches, is dark brown silty clay loam. The lower part to a depth of 65 inches is a yellowish brown silt loam fragipan mottled in shades of gray, yellow, and strong brown.

In most places, part of the original surface layer has been removed by erosion, and tillage has mixed topsoil and subsoil together. In some places, all of the plow layer is the original topsoil, and in other places, the plow layer is essentially in 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 has been limed. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is medium to rapid, and erosion is a severe hazard. A high water table is perched above the fragipan and is 2 to 3 feet below the surface during winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of well drained Smithdale soils on narrow side slopes.

Most areas of this Loring soil are used for pasture or as woodland. A small acreage is used for row crops. This soil is poorly suited to row crops and small grains because of the severe erosion hazard. Conservation tillage, terraces, grassed waterways, and contour farming help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

This soil is well suited to grasses and legumes for hay or pasture. The use of this soil for hay and pasture is also effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, shortleaf pine, cherrybark oak, southern red oak, white oak, willow oak, sweetgum, and water oak. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is severe.

This soil is moderately limited for most urban uses because of wetness and steepness of slope. Low strength is a severe limitation for local roads and streets, and steepness of slope is a severe limitation for small commercial buildings. Proper design and construction will help overcome these limitations. The moderately slow permeability of the fragipan and wetness severely limit the use of this soil as septic tank absorption fields.

This Loring soil is in capability subclass IVe and in woodland suitability group 2o7.

LoD3—Loring silt loam, 5 to 12 percent slopes, severely eroded. This moderately well drained, sloping to strongly sloping, severely eroded soil, which has a fragipan, formed in silty material on the uplands.

Typically, the surface layer is brown silt loam about 5 inches thick. The upper part of the subsoil, which extends to a depth of 24 inches, is dark brown silt loam. The lower part to a depth of 70 inches is a silt loam fragipan mottled in shades of brown, yellow, and gray.

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

This soil ranges from very strongly acid to medium acid throughout except where the surface has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. Available water capacity is moderate. Runoff is rapid, and erosion is a severe hazard. A high water table is perched above the fragipan and is 2 to 3 feet below the surface in winter and early in spring. Tilth is only fair because of past erosion. This soil can be cultivated throughout a wide range of moisture content, but it usually crusts and packs after hard rains, and it becomes hard when dry.

Included in mapping are a few small areas of well drained Smithdale soils on side slopes and small areas of soils where erosion is less severe.

Most areas of this Loring soil are used for pasture or as woodland. This soil is poorly suited to row crops and small grains because of the hazard of erosion. Further loss by erosion is probable if cultivated crops are grown. Returning crop residue to the soil helps maintain good tilth, increases fertility, and reduces crusting. Conservation tillage, contour farming, stripcropping, rotation with grasses, terracing, and grassed waterways reduce erosion if the soil is used for crops.

This soil is suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, southern red oak, water oak, willow oak, white oak, loblolly pine, and shortleaf pine. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is severe.

This soil is moderately limited for most urban uses because of steepness of slope and wetness. Low strength is a severe limitation for local roads and streets, and steepness of slope is a severe limitation for small commercial buildings. These limitations can be overcome by proper design and construction. The moderately slow permeability of the fragipan and wetness severely limit the use of this soil for septic tank absorption fields.

This Loring soil is in capability subclass IVe and in woodland suitability group 2o7.

LrD—Lorman fine sandy loam, 8 to 12 percent slopes. This moderately well drained, strongly sloping soil formed in clayey material on uplands.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil, to a depth of about 26 inches, is red clay mottled in shades of yellow and gray. The lower part, to a depth of about 44 inches, is mottled light brownish gray and yellowish red clay. The underlying material to a depth of 74 inches is a light brownish gray silty clay loam mottled with strong brown.

This soil ranges from very strongly acid to slightly acid in the surface layer except where the surface has been limed. The upper part of the subsoil ranges from strongly acid to slightly acid, and the lower part is medium acid or slightly acid. Permeability is very slow. Available water capacity is high. Runoff is rapid, and erosion is a severe hazard. The water table is below a depth of 6 feet.

Included in mapping are small areas of moderately well drained Kolin soils and well drained Saffell and Smithdale soils. Kolin soils have gentler slopes than this Lorman soil and Saffell and Smithdale soils have steeper slopes.

Most areas of this Lorman soil are used as woodland. A small acreage is used for pasture or crops. This soil is poorly suited to row crops and small grains because of steepness of slope and the severe erosion hazard.

This soil is poorly suited to grasses and legumes for hay and pasture because of low productivity. The use of this soil for hay and pasture is effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is suited to loblolly pine and shortleaf pine. Plant competition and the hazard of erosion are slight. Because of the clayey texture of this soil, poor trafficability is a moderate limitation to logging. Conventional equipment however, can be used. Seedling mortality is a moderate limitation.

This soil has severe limitations for urban uses. The high shrink-swell potential of the soil is a limitation for dwellings and small commercial buildings and for local roads and streets. Steepness of slope is an additional limitation for small commercial buildings. The low strength of the soil is a limitation for local roads and streets. The very slow permeability of the clayey subsoil severely limits the use of this soil as septic tank absorption fields.

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

LrE—Lorman fine sandy loam, 12 to 35 percent slopes. This moderately well drained, moderately steep to steep soil formed in clayey material on uplands.

Typically, the surface layer is dark grayish brown fine sandy loam about 8 inches thick. The upper part of the subsoil, to a depth of about 28 inches, is red clay mottled with pale brown and light brownish gray. The lower part of the subsoil, to a depth of 43 inches, is mottled light olive gray and yellowish red clay. The underlying material to a depth of 80 inches is light olive gray silty clay mottled with strong brown.

This soil ranges from very strongly acid to slightly acid in the surface layer except where the surface has been limed. The upper part of the subsoil ranges from strongly acid to slightly acid, and the lower part is medium acid or slightly acid. Permeability is very slow. Available water capacity is high. Runoff is rapid, and erosion is a severe hazard. The water table is more than 6 feet below the surface.

Included in mapping are small areas of moderately well drained Kolin soils and well drained Saffell and Smithdale soils. Kolin soils have gentler slopes. Saffell and Smithdale soils are on slopes with this Lorman soil.

Most areas of this Lorman soil are used as woodland. A small acreage is used for pasture or crops. This soil is poorly suited to row crops and small grains because of steepness of slope and the severe erosion hazard.

This soil is poorly suited to grasses and legumes for hay and pasture because of low productivity and steep slopes.

This soil is moderately suited to loblolly pine and shortleaf pine. Plant competition and the hazard of erosion are slight. Because of the clayey texture of this soil, poor trafficability is a moderate limitation to logging. Conventional equipment, however, can be used. Seedling mortality is a moderate limitation.

This soil has severe limitations for urban uses. High shrink-swell potential, steep slopes, and wetness are severe limitations. Low strength is a severe limitation for local roads and streets. The very slow permeability of the clayey subsoil and the steepness of slope severely limit the use of this soil as septic tank absorption fields.

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

LS—Lorman-Smithdale association, hilly. This association consists of moderately well drained Lorman soils that formed in clayey materials and the well drained Smithdale soils that formed in loamy material on hilly uplands. Slopes range from 17 to 40 percent. These soils occur in a regular and repeating pattern. Areas are over 160 to 1,000 acres. The areas consist of narrow hilltops and broad hillsides. These hillsides are broken about every 1/2 mile by narrow drainageways that are less than 1/8 mile wide.

The Lorman soils are generally on the lower parts of the steep hillsides and make up 50 percent of the map unit. Typically, the surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil, to a depth of about 28 inches, is red clay mottled in shades of gray. The lower part, to a depth of about 45 inches, is light brownish gray clay mottled with yellowish red. The underlying material to a depth of 80 inches is light brownish gray silty clay loam mottled with strong brown and yellowish brown.

Lorman soils range from very strongly acid to slightly acid in the surface layer except where the surface has been limed. The upper part of the subsoil ranges from strongly acid to slightly acid, and the lower part is medium acid or slightly acid. Permeability is very slow. Available water capacity is high. Runoff is rapid, and erosion is a severe hazard. The water table is more than 6 feet below the surface.

The Smithdale soils are generally on the upper slopes of the steep hillsides and make up 25 percent of the map unit. Typically, the surface layer is dark grayish brown sandy loam 3 inches thick over light yellowish brown sandy loam 12 inches thick. The subsoil to a depth of 40 inches is yellowish red sandy clay loam. Below that, the subsoil is yellowish red sandy loam to a depth of 80 inches.

Smithdale soils are very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is moderate. Runoff is rapid, and erosion is a severe hazard. The water table is more than 6 feet below the surface.

Included in mapping, and making up 25 percent of the map unit, are a few small areas of moderately well drained Kolin and Providence soils on the higher narrow hilltops and somewhat poorly drained Gillsburg soils and moderately well drained Oaklimeter soils on flood plains in the narrow drainageways.

Most areas of this association are used as woodland. These soils are poorly suited to cultivated crops and grasses and legumes for hay and pasture because of steepness of slope, low productivity, and severe erosion hazard.

The Lorman soils are moderately suited and the Smithdale soils are well suited to loblolly pine and shortleaf pine. Equipment use limitations are slight on Smithdale soils and moderate on Lorman soils. Also, seedling mortality is a moderate limitation on Lorman soils. Plant competition is a moderate limitation on Smithdale soils.

Lorman and Smithdale soils are severely limited for urban uses because of steepness of slope. Lorman soils have high shrink-swell potential, which is a severe limitation for urban uses. Steepness of slope and the very slow permeability of the clayey subsoil of Lorman soils are severe limitations for septic tank absorption fields.

These soils are in capability subclass VIIe. Lorman soils are in woodland suitability group 3c2, and Smithdale soils are in woodland suitability group 2o1.

MeB2—Memphis silt loam, 2 to 5 percent slopes, eroded. This well drained, gently sloping soil formed in silty material on uplands.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The upper part of the subsoil, to a depth of about 27 inches, is dark brown silty clay loam. The middle part, to a depth of about 34 inches, is brown silty clay loam. The lower part of the subsoil, to a depth of about 60 inches, is brown silt loam. The underlying material is strong brown silt loam to a depth of 80 inches.

In most places, part of the original surface layer has been removed by erosion, and tillage has mixed topsoil and subsoil together. In some places, all of the plow layer is the original topsoil, and in other places the plow layer is essentially in 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 has been limed. Permeability is moderate. Available water capacity is high. Runoff is medium, and erosion is a moderate hazard. The water table is more than 6 feet below the surface. The surface is friable and easily tilled throughout a wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of well drained Lexington soils and moderately well drained Loring soils. Lexington soils are on narrow ridgetops, and Loring soils are in small depressional areas.

Most areas of this Memphis soil are used for pasture or cropland. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. Conservation tillage, grassed waterways, terracing, and contour farming will help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

This Memphis soil is well suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is effective in controlling erosion. This soil is subject to surface compaction. Grazing should be controlled when the soil is too wet. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, loblolly pine, sweetgum, water oak, and yellow-poplar. The erosion hazard, equipment limitation, and seedling mortality are slight; plant competition is moderate.

This soil has slight limitations for most urban uses. Low strength is a severe limitation for local roads and streets. This soil has slight limitations for use as septic tank absorption fields.

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

MeC2—Memphis silt loam, 5 to 8 percent slopes, eroded. This well drained, sloping eroded soil formed in silty material on uplands.

Typically, the surface layer is brown silt loam about 5 inches thick. The upper part of the subsoil, to a depth of 45 inches, is dark brown silty clay loam. The lower part of the subsoil, to a depth of 60 inches, is dark brown silt loam. The underlying material is dark yellowish brown silt loam to a depth of 80 inches.

In most places, part of the original surface layer has been removed by erosion, and tillage has mixed topsoil and subsoil together. In some places, all of the plow layer is the original topsoil, and in other places, the plow layer is essentially in 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 has been limed. Permeability is moderate. Available water capacity is high. Runoff is medium, and erosion is a moderate hazard. The water table is more than 6 feet below the surface. The surface layer is friable and easily tilled throughout a wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of well drained Lexington soils and moderately well drained Loring soils on upland positions similar to those of this Memphis soil.

Most areas of this Memphis soil are used for pasture or crops. A small acreage is in woodland. This soil is suited to cotton, corn, soybeans, and small grains. Conservation tillage, grassed waterways, terracing, contour stripcropping, and contour farming help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

This soil is well suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is effective in controlling erosion. Grazing when the soil is too wet causes surface compaction. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, loblolly pine, sweetgum, water oak, and yellow-poplar. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

This soil has slight to severe limitations for most urban uses. For small commercial buildings, steepness of slope is a moderate limitation. For local roads and streets, low strength is a severe limitation. This soil has slight limitations for use as septic tank absorption fields.

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

Ok—Oaklimeter silt loam. This moderately well drained, nearly level soil formed in silty alluvium on broad flood plains that occasionally overflow for brief periods in winter and early in spring. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick that has pale brown mottles. The subsoil to a depth of about 15 inches is yellowish brown silt loam that has pale brown mottles. Between depths of about 15 and 27 inches, the subsoil is yellowish brown silt loam that has pale brown, dark yellowish brown, and light brownish gray mottles. Below that, to a depth of about 38 inches, it is mottled light gray, light brownish gray, and yellowish brown silt loam. Between depths of 38 and 64 inches, is mottled light brownish gray, yellowish brown, and dark grayish brown silt loam.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is high. Runoff is slow, and erosion is a slight hazard. The seasonal high water table is 1 1/2 to 2 1/2 feet below the surface during winter and spring. The surface layer is friable and easily tilled throughout a wide range of moisture content, but it usually crusts and packs after hard rains.

Included with this soil in mapping are a few small areas of well drained Ariel soils, somewhat poorly drained Gillsburg soils, and poorly drained Guyton soils. Ariel soils are on higher positions on the landscape, and Gillsburg and Guyton soils are in small depressional areas.

Most areas of this Oaklimeter soil are used for pasture or as woodland. A small acreage is used for crops. This soil is well suited to cotton, corn, soybeans, and small grains (fig. 5). Proper row arrangement and surface field ditches are needed to remove excess surface water. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

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. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, eastern cottonwood, green ash, water oak, sweetgum, American sycamore, and loblolly pine. The equipment use limitation, erosion hazard, and seedling mortality are slight; plant competition is moderate.

This soil is severely limited for most urban uses because of flooding. Flooding and wetness are severe limitations to the use of this soil as septic tank absorption fields.

This Oaklimeter soil is in capability subclass IIw and in woodland suitability group 1o8.

PrA—Providence silt loam, 0 to 2 percent slopes. This moderately well drained, nearly level soil, which has a fragipan, formed in a mantle of silty material and underlying loamy sediment on uplands and stream terraces.

Typically, the surface layer is brown silt loam about 7 inches thick. The upper part of the subsoil, to a depth of about 23 inches, is strong brown silt loam. The middle part, to a depth of about 36 inches, is a yellowish brown, light grayish brown, and strong brown silt loam fragipan. The lower part of the subsoil to a depth of 64 inches is a mottled, yellowish red, gray, and brown clay loam fragipan.

This soil ranges from very strongly acid to medium acid throughout except where the surface has been limed. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is slow, and erosion is a slight

Figure 5.—Corn growing on Oaklimeter silt loam.

hazard. A high water table is perched above the fragipan and is 1 1/2 to 3 feet below the surface during winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of well drained Ariel soils and somewhat poorly drained Bude and Calloway soils. Ariel soils are in small areas of flood plains; Bude and Calloway soils are in small depressional areas.

Most areas of this Providence soil are used for crops and pasture. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. Proper row arrangement, grassed waterways, and surface field ditches help control erosion and wetness on cultivated fields. Returning crop residue to the soil increases soil fertility, improves tilth, and reduces crusting.

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. Management concerns include proper stocking, controlled grazing, and weed and brush control.

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

This soil is moderately limited for most urban uses because of wetness and the shrink-swell potential. For local roads and streets, low strength is a severe limitation. Proper design and construction will help overcome these limitations. The moderately slow permeability of the fragipan and wetness severely limit the use of this soil as septic tank absorption fields.

This Providence soil is in capability subclass IIw and in woodland suitability group 2o7.

PrB2—Providence silt loam, 2 to 5 percent slopes, eroded. This moderately well drained, gently sloping soil, which has a fragipan, formed in a mantle of silty material and underlying loamy sediment on uplands and stream terraces.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The upper part of the subsoil to a depth of about 25 inches is strong brown silty clay loam. The middle part, to a depth of about 46 inches, is a strong brown silt loam fragipan that has yellowish brown and pale brown mottles. The lower part of the subsoil to a depth of 70 inches is a mottled, yellowish red and yellowish brown clay loam fragipan.

In most places, part of the original surface layer has been removed by erosion, and tillage has mixed topsoil and subsoil together. In some places, all of the plow layer is the original topsoil, and in other places, the plow layer is essentially in 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 above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is medium, and the erosion hazard is moderate. A high water table is perched above the fragipan and is 1 1/2 to 3 feet below the surface during winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of somewhat poorly drained Bude soils and moderately well drained Grenada and Kolin soils. Bude and Grenada soils are in lower depressional areas; Kolin soils are on positions on the landscape similar to those of this Providence soil.

Most areas of this Providence soil are used for crops and pasture. A small acreage is in woodland. This soil is well suited to cotton, corn, soybeans, and small grains. Conservation tillage, grassed waterways, and contour farming help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

This soil is well suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is also effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

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

This soil is moderately limited for most urban uses because of wetness and the shrink-swell potential. For local roads and streets, low strength is a severe limitation. Proper design and construction will help overcome these limitations. The moderately slow permeability of the fragipan and wetness severely limit the use of this soil as septic tank absorption fields.

This Providence soil is in capability subclass IIe and in woodland suitability group 2o7.

PrC2—Providence silt loam, 5 to 8 percent slopes, eroded. This moderately well drained, sloping, eroded soil, which has a fragipan, formed in a mantle of silty material and underlying loamy sediment on uplands.

Typically, the surface layer is brown silt loam about 7 inches thick. The upper part of the subsoil, to a depth of about 25 inches, is strong brown silty clay loam. The middle part, to a depth of 38 inches, is a strong brown silt loam fragipan mottled with light grayish brown and yellowish brown. The lower part of the subsoil to a depth of 72 inches is a mottled, yellowish red, gray, and strong brown clay loam fragipan.

In most places, part of the original surface layer has been removed by erosion, and tillage has mixed topsoil and subsoil together. In some places, all of the plow layer is the original topsoil, and in other places, the plow layer is essentially in 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 has been limed. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is medium, and erosion is a moderate hazard. A high water table is perched above the fragipan and is 1 1/2 to 3 feet below the surface during the winter and early in spring. The surface layer is friable and easily tilled throughout a fairly wide range of moisture content, but it usually crusts and packs after hard rains.

Included in mapping are small areas of moderately well drained Kolin and Lax soils. These soils are on positions similar to those of this Providence soil.

Most areas of this Providence soil are used for crops and pasture. A small acreage is in woodland. This soil is suited to cotton, corn, soybeans, and small grains. Conservation tillage, grassed waterways, terracing, and contour farming help control erosion on cultivated fields (fig. 6, 7). Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

This soil is well suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

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

This soil is moderately limited for most urban uses because of wetness, the shrink-swell potential, and steepness of slope. For local roads and streets, low strength is a severe limitation. Proper design and construction will help overcome these limitations. The moderately slow permeability of the fragipan and wetness severely limit the use of this soil as septic tank absorption fields.

This Providence soil is in capability subclass IIIe and in woodland suitability group 2o7.

Figure 6.—Grassed waterway on Providence silt loam, 5 to 8 percent slopes, eroded.

Figure 7.—Corn growing in same area shown in figure 6.

PrC3—Providence silt loam, 5 to 12 percent slopes, severely eroded. This moderately well drained, sloping to strongly sloping, severely eroded soil, which has a fragipan, formed in a mantle of silty material and underlying loamy sediment on uplands.

Typically, the surface layer is yellowish brown silt loam about 2 inches thick. The upper part of the subsoil, to a depth of about 19 inches, is strong brown silty clay loam. The middle part, to a depth of about 38 inches, is a silt loam fragipan that is mottled strong brown, yellowish brown, and light brownish gray. The lower part of the subsoil to a depth of 68 inches is a yellowish red sandy clay loam fragipan that is mottled in shades of gray and yellow.

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

This soil ranges from very strongly acid to medium acid throughout except where the surface has been limed. Permeability is moderate above the fragipan and moderately slow in the fragipan. Available water capacity is moderate. Runoff is rapid, and the erosion hazard is severe. A high water table is perched above the fragipan and is 1 1/2 to 3 feet below the surface during winter and early in spring.

Included with this soil in mapping are small areas of moderately well drained Kolin and Lax soils. These soils are on landscape positions similar to those of this Providence soil.

Most areas of this Providence soil are used as woodland. A small acreage is used for pasture and crops. This soil is poorly suited to row crops and small grains because of the hazard of erosion.

This soil is suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is effective in controlling erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Management concerns include proper stocking, controlled grazing, and weed and brush control.

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

This soil is moderately limited for most urban uses because of wetness, the shrink-swell potential, and steepness of slope. For small commercial buildings, the steepness of slope is a severe limitation. For local roads and streets, low strength is a severe limitation. Proper design and construction will help overcome these limitations. The moderately slow permeability of the fragipan and wetness severely limit the use of this soil as a septic tank absorption field.

This Providence soil is in capability subclass VIe and in woodland suitability group 2o7.

SaE—Saffell gravelly sandy loam, 12 to 17 percent slopes. This well drained, moderately steep soil formed in gravelly loamy and sandy material on uplands.

Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of about 14 inches. The upper part of the subsoil, to a depth of about 36 inches, is yellowish red gravelly sandy clay loam. The lower part, to a depth of about 52 inches, is yellowish red gravelly sandy loam. The underlying material to a depth of 80 inches is yellowish red very gravelly loamy sand.

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

Included in mapping are small areas of moderately well drained Lax soils and well drained Smithdale soils. Lax soils are in the gently sloping areas, and Smithdale soils are on positions on the landscape similar to those of this Saffell soil.

Most areas of this soil are used as woodland or for pasture. A small acreage is used for crops. This soil is poorly suited to row crops and small grain because the slopes are too steep, and erosion is a severe hazard.

This soil is poorly suited to grasses and legumes for hay and pasture because of low productivity. The use of this soil for hay and pasture is effective in controlling erosion. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is poorly suited to loblolly pine, shortleaf pine, and eastern redcedar because of the low available water capacity. However, pines are recommended. The erosion hazard, equipment use limitation, and plant competition are slight; seedling mortality is moderate.

This soil is severely limited for urban uses because of steepness of slope. Proper design and construction will help overcome this limitation. Steepness of slope is a severe limitation for septic tank absorption fields.

This Saffell soil is in capability subclass VIe and in woodland suitability group 4f2.

SaF—Saffell gravelly sandy loam, 17 to 40 percent slopes. This well drained, steep soil formed in gravelly loamy and sandy material on uplands.

Typically, the surface layer is dark grayish brown gravelly sandy loam about 7 inches thick. The subsurface layer is yellowish brown gravelly sandy loam to a depth of about 16 inches. The upper part of the subsoil, to a depth of 35 inches, is yellowish red very gravelly sandy clay loam. The lower part of the subsoil, to a depth of about 48 inches, is a strong brown gravelly sandy loam. The underlying material to a depth of 80 inches is yellowish red very gravelly loamy sand.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed.

Permeability is moderate. Available water capacity is low. Runoff is rapid, and erosion is a severe hazard. The water table is more than 6 feet below the surface.

Included in mapping are small areas of moderately well drained Lax soils and well drained Smithdale soils. Lax soils are in gently sloping areas, and Smithdale soils are on positions on the landscape similar to those of this Saffell soil.

Most of the acreage of this soil is used as woodland. A small acreage is in pasture. This soil is poorly suited to row crops and small grains because of the hazard of erosion and steepness of slopes.

This soil is poorly suited to grasses and legumes for hay and pasture because of the steep slopes and low productivity.

This soil is poorly suited to loblolly pine and shortleaf pine because of the low available water capacity. However, if trees are planted, pines are recommended. Most woodland management limitations are moderate.

This soil is severely limited for most urban uses because of steepness of slope. This is a severe limitation to the use of the soil as septic tank absorption fields.

This Saffell soil is in capability subclass VIIe and in woodland suitability group 4f2.

SF—Saffell-Smithdale association, hilly. This association consists of well drained, sloping to steep Saffell and Smithdale soils. Saffell soils formed in gravelly sandy material and Smithdale soils formed in loamy material on hilly uplands. These soils are in a regular and repeating pattern on narrow hilltops and broad hillsides. These hillsides are broken about every 1/2 mile by narrow drainageways less than 1/8 mile wide. Areas are 160 to 900 acres. Slopes range from 5 to 40 percent.

The Saffell soils are generally on the middle and lower parts of the side slopes in the uplands and make up 50 percent of the map unit. Typically, the surface layer is dark grayish brown gravelly sandy loam about 7 inches thick. The subsurface layer, to a depth of about 14 inches, is brown gravelly sandy loam. The subsoil, to a depth of about 45 inches, is yellowish red very gravelly sandy clay loam. The underlying material to a depth of 80 inches is yellowish red very gravelly loamy sand.

Saffell soils are very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is low. Runoff is rapid, and erosion is a severe hazard. The water table is more than 6 feet below the surface.

The Smithdale soils usually are on the upper and middle parts of the side slopes on uplands and make up 30 percent of the unit. Typically, the surface layer is dark grayish brown sandy loam about 4 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of about 16 inches. The upper part of the subsoil, to a depth of about 40 inches, is yellowish red sandy clay loam. The lower part of the subsoil to a depth of 80 inches is red sandy loam.

Smithdale soils are very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is moderate. Runoff is rapid, and erosion is a severe hazard. The water table is more than 6 feet below the surface.

Included in mapping, and making up 20 percent of the unit, are a few small areas of moderately well drained Providence soils on the narrow hilltops, moderately well drained Lorman soils and well drained soils that have a thick sandy surface layer on the steep hillsides, and well drained Ariel soils in the narrow drainageways.

Most of the acreage of this association is used as woodland. A small acreage is used for grasses and legumes for hay and pasture. This soil is poorly suited to row crops and hay and pasture because of the steepness of slope and the severe erosion hazard.

Saffell soils are poorly suited to loblolly pine and shortleaf pine because of the low available water capacity. However, if trees are planted, pines are recommended. Smithdale soils are well suited to loblolly pine and shortleaf pine. Most woodland management limitations are moderate on Saffell soils and slight on Smithdale soils. Plant competition is a moderate limitation on the Smithdale soils and a slight limitation on the Saffell soils.

These soils are severely limited for urban uses because of steepness of slope. Slope is a severe limitation of these soils as septic tank absorption fields.

These Saffell and Smithdale soils are in capability subclass VIIe. Saffell soils are in woodland suitability group 4f2, and Smithdale soils are in woodland suitability group 2o1.

SmD—Smithdale sandy loam, 8 to 12 percent slopes. This well drained, strongly sloping soil formed in loamy material on uplands.

Typically, the surface layer is brown sandy loam about 7 inches thick. The upper part of the subsoil, to a depth of about 28 inches, is yellowish red sandy clay loam. The middle part, to a depth of about 39 inches, is yellowish red sandy clay loam with pale yellow sand pockets. The lower part of the subsoil to a depth of 80 inches is a red sandy loam.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is moderate. Runoff is rapid, and erosion is a severe hazard. The water table is more than 6 feet below the surface. The surface layer is friable and easily tilled throughout a wide range of moisture content.

Included in mapping are small areas of moderately well drained Kolin and Lorman soils and well drained Saffell soils. Kolin soils are in gently sloping areas;

Lorman and Saffell soils are on positions on the landscape similar to those of this Smithdale soil.

Most areas of this Smithdale soil are used for pasture or as woodland. A small acreage is in row crops. This soil is poorly suited to row crops and small grains because of the steepness of slopes and hazard of erosion. Conservation tillage, grassed waterways, contour stripcropping, terraces, and contour farming will help control erosion on cultivated fields. Returning crop residue to the soil increases soil fertility, improves soil tilth, and reduces crusting.

This Smithdale soil is suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture is also effective in controlling erosion. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, slash pine, and shortleaf pine. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

This soil has moderate limitations for most urban uses because of steepness of slope. Steepness of slope is a moderate limitation of this soil for septic tank absorption fields and dwellings. Slope is a severe limitation for small commercial buildings. Proper design and construction will help overcome these limitations.

This Smithdale soil is in capability subclass IVe and in woodland suitability group 2o1.

SmE—Smithdale sandy loam, 12 to 17 percent slopes. This well drained, moderately steep soil formed in loamy material on uplands.

Typically, the surface layer is dark grayish brown sandy loam about 7 inches thick. The upper part of the subsoil, to a depth of about 21 inches, is yellowish red sandy clay loam. The middle part, to a depth of about 52 inches, is a yellowish red sandy loam. The lower part of the subsoil to a depth of 80 inches is red sandy loam.

This soil is very strongly acid to strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is moderate. Runoff is rapid, and the erosion is a severe hazard. The water table is more than 6 feet below the surface.

Included in mapping are small areas of moderately well drained Lorman soils and well drained Saffell soils.

Most of the acreage of this soil is used for pasture or as woodland. This soil is poorly suited to row crops and small grains because of the steepness of slope and the severe erosion hazard.

This Smithdale soil is suited to grasses and legumes for hay and pasture. The use of soil for hay and pasture is also effective in controlling erosion. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, slash pine, and shortleaf pine. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

This soil is severely limited for urban uses because of the steepness of slopes. Proper design and construction will help overcome this limitation. The steepness of slope is a severe limitation to the use of this soil as septic tank absorption fields.

This Smithdale soil is in capability subclass VIe and woodland suitability group 2o1.

SmF—Smithdale sandy loam, 17 to 40 percent slopes. This well drained, steep soil formed in loamy material on uplands.

Typically, the surface layer is dark grayish brown sandy loam about 3 inches thick. The subsurface layer is yellowish brown sandy loam and extends to a depth of about 17 inches. The upper part of the subsoil, to a depth of about 40 inches, is red sandy clay loam. The middle part, to a depth of about 60 inches, is red sandy loam that has very pale brown sand pockets. The lower part of the subsoil to a depth of 80 inches is yellowish red sandy loam that has pockets of uncoated sand grains.

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

Included in mapping are small areas of moderately well drained Lorman soils and well drained Saffell soils.

Most areas of this Smithdale soil are used as woodland. A small acreage is used for pasture. This soil is poorly suited to row crops because of the steepness of slope and the severe erosion hazard.

This soil is poorly suited to grasses and legumes for hay and pasture. The steepness of slope and the erosion hazard are limitations.

This soil is well suited to loblolly pine, slash pine, and shortleaf pine. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

This soil is severely limited for urban uses because of the steepness of slope. Also, slope is a severe limitation for septic tank absorption fields.

This Smithdale soil is in capability subclass VIIe and in woodland suitability group 2o1.

SmF3—Smithdale sandy loam, 17 to 40 percent slopes, severely eroded. This well drained, steep, severely eroded soil formed in loamy material on hilly uplands.

Typically, the surface layer is strong brown sandy loam about 3 inches thick. The upper part of the subsoil, to a depth of about 33 inches, is yellowish red sandy clay loam. The middle part, to a depth of about 43 inches, is red sandy loam. The lower part of the subsoil to a depth of 80 inches is red sandy loam with pale brown sand pockets.

In most areas of this severely eroded soil, the original surface layer has been lost through erosion, and the plow layer consists entirely of subsoil. However, in some places the surface layer is a mixture of topsoil and subsoil. Rills and shallow gullies are common, and a few deep gullies, which cannot be crossed by farm machinery, have formed.

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

Included in mapping are small areas of moderately well drained Lorman soils and well drained Saffell soils.

Most of the acreage of this soil is used as woodland. A small acreage is in pasture. This land is poorly suited to row crops and small grains because of steep slopes, gullies, and poor soil conditions that resulted from past severe erosion.

This Smithdale soil is poorly suited to grasses and legumes for hay and pasture because of steep slopes and the erosion hazard.

This soil is well suited to loblolly pine, slash pine, and shortleaf pine. The erosion hazxard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

This soil is severely limited for urban uses because of the steepness of slope. Also, slope is a severe limitation for septic tank absorption fields.

This Smithdale soil is in capability subclass VIIe and in woodland suitability group 2o1.

ST—Smithdale-Lexington association, hilly. This association consists of well drained Smithdale and Lexington soils. Smithdale soils formed in loamy material on sloping to steep hillsides on uplands. Lexington soils formed in a mantle of silty material and underlying loamy material on sloping hilltops and steep hillsides. The side slopes are broken about every 1/2 to 3/4 mile by drainageways less than 1/8 mile wide. Slopes range from 5 to 40 percent. These soils are in a regular and repeating pattern on narrow hilltops and broad hillsides. Areas are 160 to 800 acres.

The Smithdale soils are generally on the middle and lower parts of the steep side slopes and make up 50 percent of the map unit. Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsurface layer is pale brown sandy loam and extends to a depth of about 10 inches. The upper part of the subsoil, to a depth of 42 inches, is yellowish red sandy clay loam. The lower part of the subsoil to a depth of 80 inches is yellowish red sandy loam that has pockets of pale brown sand grains.

Smithdale soils are very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is moderate. Runoff is rapid, and erosion is a severe hazard. The water table is more than 6 feet below the surface.

The Lexington soils make up about 27 percent of the map unit. Typically, the surface layer is brown silt loam about 6 inches thick. The upper part of the subsoil, to a depth of 31 inches, is dark brown silty clay loam. The middle part, to a depth of about 50 inches, is strong brown sandy loam. The lower part of the subsoil to a depth of 80 inches is yellowish red sandy loam.

Lexington soils are strongly acid or medium acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is moderate. Runoff is rapid, and erosion is a severe hazard. The water table is below a depth of 6 feet.

Included in mapping, and making up 23 percent of the map unit, are a few small areas of moderately well drained Kolin and Loring soils on the narrow ridgetops, Lorman soils and a well drained soil with a sandy surface layer over 30 inches thick on the steeply sloping side slopes, and well drained Ariel soils in the narrow drainageways.

Most of this association is used as woodland. A small acreage is used for grasses and legumes for hay and pasture. These soils are poorly suited to row crops and pasture because of the steepness of slope and severe erosion hazard.

Smithdale soils are well suited to loblolly pine, slash pine, and shortleaf pine. Lexington soils are well suited to these pines as well as cherrybark oak, yellow-poplar, and sweetgum. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

These soils are severely limited for urban uses and septic tank absorption fields because of steepness of slope.

These Smithdale and Lexington soils are in capability subclass VIIe. Smithdale soils are in woodland suitability group 2o1, and Lexington soils are in woodland suitability group 2o7.

Ud—Udorthents, gravelly. These areas consist of gravel pits and borrow pits that are scattered throughout the county. These pits are open excavations from which gravel and sand have been removed. Depth to these materials ranges from 0 to 50 feet or more.

Gravel pits are areas from which gravelly material has been excavated. Some pits are fairly high in clay content; this material is called clay gravel. The gravel is several feet thick.

Borrow pits are areas from which clay has been excavated. Also, there are a few pits from which silty material was excavated for use as fill material.

Some abandoned pits have been naturally reforested in sparse growth. A few areas have a good stand of pine trees.

In the open pits, the soil material supports low quality grass and trees mainly on loamy materials that have only moderate amounts of gravel. Most of this onsite vegetation is useful only for erosion control. Many acres of the map unit are without vegetation. Udorthents are usually poorly suited to crops, grasses and legumes, and trees and have moderate to severe limitations for most urban uses.

This map unit was not assigned to a capability subclass or to a woodland suitability group.

Ve—Velda very fine sandy loam. This well drained, nearly level soil formed in silty material in broad areas on the Pearl River flood plain. This soil is occasionally flooded for brief periods in winter and early in spring. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown very fine sandy loam about 6 inches thick. The upper part of the subsoil, to a depth of about 24 inches, is dark yellowish brown silt loam. The middle part, to a depth of about 46 inches, is yellowish brown silt loam. The lower part of the subsoil, which extends to a depth of about 55 inches, is yellowish brown very fine sandy loam that has pale brown mottles. The underlying material to a depth of 74 inches is pale brown loamy fine sand that has thin strata of sandy loam.

This soil is very strongly acid or strongly acid throughout except where the surface has been limed. Permeability is moderate. Available water capacity is high. Runoff is slow, and erosion is a slight hazard. The water table is more than 6 feet below the surface. This soil has good tilth and can be worked throughout a wide range of moisture content.

Included in mapping are small areas of excessively drained Bruno soils and poorly drained Guyton soils. Bruno soils are on higher positions on the landscape, and Guyton soils are in depressional areas.

This soil is used mainly for pasture. A small acreage is in woodland. This soil is well suited to row crops including cotton, corn, soybeans, and small grains. Proper row arrangement and surface field ditches are needed to remove excess surface water. Returning crop residue to the soil and conservation tillage increase fertility, improve tilth, and reduce crusting.

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. Management concerns include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, sweetgum, yellow-poplar, water oak, and loblolly pine. The erosion hazard, equipment use limitation, and seedling mortality are slight; plant competition is moderate.

This soil is severely limited for urban uses because of flooding. Flooding is a severe limitation to the use of this soil as septic tank absorption fields.

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

Prime farmland

Prime farmland is one of several kinds of important farmlands defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. The supply of high quality farmland is limited and the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, must encourage and facilitate the use of our Nation's prime farmland with wisdom and foresight.

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

Prime farmland is either currently used for producing food or fiber or available for this use. Urban or built-up land or water areas are not included. Urban or built-up land is any unit of land 10 acres or more that is used for residences, industrial sites, commercial sites, construction sites, institutional sites, railroad yards, small parks, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water control structures and spillways, and shooting ranges.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation or irrigation. It also has favorable temperature and growing season and acceptable acidity or alkalinity. It has few or no rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods and is not flooded during the growing season. The slopes range mainly from 0 to 6 percent. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

About 236,000 acres, or about 47 percent, of Copiah County meets the soil requirements for prime farmland. Areas are scattered throughout the county mainly in map units 1 through 10 of the general soil map. Crops grown on this land, mainly corn, cotton, and soybeans, account for an estimated two-thirds of the county's total agricultural income each year (*12*).

A recent trend in land use in some parts of the county has been the loss of some prime farmlands to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and difficult to cultivate, and usually less productive.

Soil map units that make up prime farmland in Copiah County are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on detailed soil maps in the back of this publication. The soil qualities that affect use and management are described in the section "Detailed soil map units."

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

The soil map units in this list are prime farmland except where the use is urban or built-up land or they fail to meet the criteria indicated in parentheses.

Ae	Ariel silt loam
Ar	Arkabutla silt loam (where protected from flooding)
Bu	Bude silt loam, 0 to 2 percent slopes
CaA	Cahaba sandy loam, 0 to 2 percent slopes
CaB	Cahaba sandy loam, 2 to 5 percent slopes
CoA	Calloway silt loam, 0 to 2 percent slopes
CuA	Columbus silt loam, 0 to 2 percent slopes
Gb	Gillsburg silt loam
GrA	Grenada silt loam, 0 to 2 percent slopes
Gu	Guyton silt loam (where drained for crops)
KoB	Kolin silt loam, 2 to 5 percent slopes, eroded
LaB	Latonia loamy sand, 0 to 5 percent slopes
LbB2	Lax silt loam, 2 to 5 percent slopes, eroded
LoA	Loring silt loam, 0 to 2 percent slopes
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded
Ok	Oaklimeter silt loam
PrA	Providence silt loam, 0 to 2 percent slopes
PrB2	Providence silt loam, 2 to 5 percent slopes, eroded
Ve	Velda very fine sandy loam

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, soil conservationists, foresters, grassland 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 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

Bennie F. Hutchins, 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.

The soils in Copiah County have good potential for increased production of food. In addition to the reserve productive capacity represented by this soil, food production can be increased considerably by extending the latest crop production technology to all cropland in the county. This soil survey can help facilitate the application of such technology.

Soil erosion is the major concern on about three-fourths of the cropland and pasture in Copiah County. If the slope is more than 2 percent, erosion is a hazard. Cahaba, Kolin, Lax, Loring, Lorman, Memphis, Providence, and Smithdale soils are examples of these soils.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a clayey subsoil, such as Kolin and Lorman 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 Bude, Calloway, Lax, Loring, and Providence soils. Erosion also reduces productivity on soils that tend to be droughty, such as Bruno sandy loam and Latonia soils. Second, soil erosion on farmland results in sedimentation of streams. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife habitat.

In many sloping fields, tilling or preparing a good seedbed is 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 Kolin, Loring, and Providence soils.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps vegetative 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, provide some nitrogen, and improve tilth.

Conservation tillage and leaving crop residue on the surface help increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the county, but they are more difficult to use successfully on the eroded soils, such as Kolin, Lax, Loring, Memphis, and Providence soils. Conservation tillage acreage for soybeans is increasing each year and is effective in reducing erosion on sloping land. This practice can be adapted to many soils in the county.

Terraces and diversions reduce the length of slope and reduce runoff and erosion. They are practical on deep, well drained soils that have regular slopes. Cahaba, Kolin, Loring, Memphis, and Providence soils are suitable for terraces. The other soils are less suitable for terraces and diversions because of irregular slopes, excessive wetness in the terrace channels, or a clayey subsoil which would be exposed in terrace channels.

Contour farming is common in the survey area. This erosion control practice is best adapted to soils that have smooth, uniform slopes, including some areas of the sloping Loring, Memphis, and Providence soils.

Information for the design of erosion control practices for each kind of soil is contained in the Technical Guide, available in local offices of the Soil Conservation Service.

Soil drainage is the major management need on about one-fourth of the acreage used for crops and pasture in the survey area. Some soils are so wet that the production of crops common to the area is generally not possible. These are the poorly drained Guyton soils, which make up about 11,241 acres in the county.

Unless artificially drained, the somewhat poorly drained soils are so wet that crops are damaged during most years. In this category are the Arkabutla and Gillsburg soils which make up about 47,637 acres. Cahaba and Memphis soils have good natural drainage most of the year.

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 most crops. Available phosphorus and potash levels are naturally low in most of these soils. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the need of the crop, and on the expected level of yields. The Cooperative Extension Service can 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 county have a surface layer of silt loam that is light in color and low in organic matter content. Generally, the structure of such soils is weak, and intense rainfall causes the formation of a crust on the surface. The crust is hard when dry and nearly impervious to water. Once the crust forms, it reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material can help improve soil structure and reduce crust formation.

Fall plowing is generally not a good practice on the light-colored soils that have a surface layer of silt loam because of the crust that forms during winter and spring. Many of the soils are nearly as dense and hard at planting time after fall plowing as they were before they were plowed. Also, about two-thirds of the cropland consists of sloping soils and bottom land overflow soils that are subject to damaging erosion if they are plowed in the fall.

Using soils for cultivated crops reduces organic matter content, removes plant nutrients, increases compaction of the soil and crusting of the surface layer, and increases erosion. Cropping management systems are therefore needed to maintain an acceptable level of organic matter content, maintain or increase soil fertility, and control erosion.

Consideration should be given to use of cropping management systems that include the use of crop rotation, return of crop residue to the land, and the use of fertilizers and agricultural lime as needed. Such management systems should also include the use of such erosion control measures as contouring, establishing grassed waterways, maintaining strips of vegetation around the edges of fields, terracing or contour stripcropping, and keeping tillage to a minimum. The use of erosion control measures is determined by the severity of the erosion problem depending on the kind of soil and length and gradient of slope.

Crop residue should be shredded after harvest and left on the soil surface until time to prepare the land for the next crop. Where land is subject to flooding, the residue should be left standing.

Additional information on crop production and management is available from the Cooperative Extension Service or the local office of the Soil Conservation Service. On such soils as Arkabutla, Gillsburg, and Guyton soils, surface and internal drainage is a concern. Drainage mains and laterals with surface field ditches are needed. Diversions are needed in places to protect bottom lands from receiving excess water from adjacent higher areas.

On such gently sloping soils as Loring silt loam, 2 to 5 percent slopes, eroded, contour cultivation with terraces or stripcropping and proper use of crop residue may be needed to control soil erosion. On steeper soils where the erosion hazard is severe—for example, Smithdale sandy loam, 8 to 12 percent slopes—the use of conservation tillage or no-tillage, together with proper use of residue, is needed if the land is to remain in row crops. Very steep, severely eroded land should be used for pasture or as woodland.

Field crops suited to the soils and climate of the survey area include many that are not commonly grown. Corn, cotton, and soybeans are the common row crops. Sunflowers, peanuts, and similar crops can be grown if economic conditions are favorable.

Wheat, oats, and annual ryegrass are the common close-growing crops; some commercial grass-sod production is included.

Special crops grown commercially in the county are vegetables, tree fruits, and nursery plants. A considerable acreage throughout the survey area is used for tomatoes, cabbage, cucumbers, pimento peppers, melons, strawberries, raspberries, sweet corn, and other vegetables. In addition, other areas can be adapted to other special crops such as blueberries, grapes, and many vegetables. Peaches are the most important tree fruit grown in the county.

Soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables and small fruits. In the county, these are the Ariel, Cahaba, Latonia, Lax, Loring, Memphis, Providence, and Velda soils that have slopes of less than 5 percent. Crops can generally be planted and harvested earlier on all of these soils than on the other soils in the survey area, with the exception of Ariel and Velda soils that are prone to flooding during heavy spring rains.

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

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

Soils used for pasture should be established to a combination of adapted perennial grasses and legumes for production of high quality forage. There are a number of perennial grasses suited to different soils. They include common bermudagrass, bahiagrass, improved bermudagrass, and tall fescue. Well suited legumes are white clover, crimson clover, ball clover, and annual lespedeza.

Certain grasses and legumes are better suited to some soils than to others. Contact the office of the local Soil Conservation Service for detailed information about pasture plants best suited to the soils on your farm.

The production of quality forage involves more than planting the correct plants. All forage plants, like other crops, require certain management practices for best results. Regular application of needed fertilizer and lime are profitable and needed for quality forage production.

The amount and kind of fertilizer should be determined by soil test. Grazing should be regulated by stocking at a rate that will maintain a 3- to 5-inch topgrowth during the growing season. Rotation grazing provides a rest period of 3 to 5 weeks to allow the plants to make sufficient topgrowth to develop and maintain a good root system. This helps to maintain a good, dense sod on the land.

The forage production system should provide forage the year round, or as long as possible. This can be done by use of winter perennial grass such as tall fescue and also by use of winter legumes in the summer pasture. In addition, annual plants such as small grains or ryegrass can be planted as temporary pasture or seeded in the perennial grass sod.

Farming and other land uses are competing for large areas of the county. Much of this acreage is well suited to crops. Each year additional land is developed for urban uses around cities and towns in the survey area.

In general, the soils in the survey area that are well suited to crops are also well suited to urban development. The data about specific soils in this soil survey can be used in planning future land use patterns. Potential productive capacity in farming should be weighed against soil limitations and potential for nonfarm development.

In some areas, however, are soils well suited to farming but poorly suited to nonfarm development. The dominant soils are Ariel, Bude, Gillsburg, and Oaklimeter—all of which are wet and all of which create serious hazards for nonfarm development because of wetness and flooding. Many areas of these soils, however, have been drained and are productive for farm crops.

Some soils are only fairly well suited to farming but are generally well suited to nonfarm development. Saffell and Smithdale soils are characterized by a rolling landscape, good soil drainage, and other soil qualities generally favorable for residential and other urban uses.

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, animal manure, and green-manure crops; and harvesting that insures the smallest possible loss.

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

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

Crops other than those shown in table 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.

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. No soils in Class VIII are recognized in Copiah 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. No soils in subclass *c* are recognized in Copiah County.

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, rangeland, 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

Terrill D. Allen, forester, Soil Conservation Service, helped prepare this section.

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 *w* indicates excessive water in or on the soil; *c*, clay in the upper part of the soil; and *f*, high content of coarse fragments in the soil profile. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: w, c, and f.

The third part of the symbol indicates the degree of hazards or limitations and the general suitability of the soils for certain kinds of trees. The three management problems considered are erosion hazard, equipment restrictions, and seedling mortality. The number 1 indicates soils that have no to slight management problems and are best suited to needleleaf trees; 2, soils that have one or more moderate management problems and are best suited to needleleaf trees; 3, soils that have one or more severe management problems and are best suited to needleleaf trees; 4, soils that have no to slight management problems and are best suited to broadleaf trees; 5, soils that have one or more moderate management problems and are best suited to broadleaf trees; 6, soils that have one or more severe management problems and are best suited to broadleaf trees; 7, soils that have no to slight management problems and are suited to either needleleaf or broadleaf trees; 8, soils that have one or more moderate management problems and are suitable for either needleleaf or broadleaf trees; 9, soils that have one or more severe management problems and are suitable for either needleleaf or broadleaf trees; and 0, soils that are not suitable for the production of major commercial wood products.

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, 35 years for American sycamore, and 50 years 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.

Copiah County is 68 percent woodland. Farmers and miscellaneous private owners own 75 percent of the woodland, public owners 5 percent, forest industry 18 percent, and the National Forest 2 percent (*9*).

Soils influence the growth of tree crops by providing a reservoir of moisture and all essential elements for growth except those that derive from the atmosphere—carbon and oxygen. A strong relationship exists between the production of wood crops and various soil characteristics.

The kind of tree and its growth show a direct relationship between soil depth, texture, structure, topographic position, and inherent fertility.

Forest types

The forest may be subdivided into forest types. Types may be based on species composition, site quality, or age. As used in this report, a forest type is a stand of trees of similar character, composed of the same species, and growing under the same ecological and biological conditions. The forest types are named for the tree species which predominate or which are present in the greatest abundance and frequency.

The *loblolly-shortleaf pine* forest type is most important in Copiah County. This type includes forests in which loblolly and shortleaf pines and eastern redcedar, singly or in combination, comprise a plurality of the stocking. In 1977, the loblolly-shortleaf forest type occupied approximately 105,000 acres, or 31 percent, of the woodland throughout the county. Common associates of this forest type are oak, hickory, sweetgum, and blackgum (*10*) (fig. 8).

The *oak-pine* forest type ranks second in importance. This type is composed of forests in which hardwoods (usually upland oaks) comprise a plurality of the stocking, but in which softwoods, except cypress, comprise 25 to 50 percent of the stocking. In 1977, the oak-pine forest type occupied approximately 100,000

Figure 8.—Loblolly-shortleaf pine forest type on Providence silt loam, 2 to 5 percent slopes, eroded.

acres, or 29 percent, of the woodland throughout the county. Common associates include hickory, sweetgum, blackgum, and yellow-poplar.

The *oak-gum-cypress* forest type is third in importance. This includes bottom land forests in which tupelo, blackgum, sweetgum, oak, or southern baldcypress, singly or in combination, comprise a plurality of the stocking. However, where pines comprise 25 to 50 percent, the stand would be classified oak-pine. In 1977, the oak-gum-cypress forest type was on about 70,000 acres, or 21 percent, of the woodland in the county. Common associates include cottonwood, black willow, ash, hackberry, maple, and elm.

In recent years much of the bottom land forest of Copiah County has been converted to cropland and pasture for economic reasons. As a result, the oak-gum-cypress forest type acreage has been drastically reduced. The remaining acreage in this forest type is located in parts of the flood plains of the Pearl River and its major tributaries—Copiah, Brushy, Indian, and Pegies Creeks and in the flood plain of White Oak Creek, Bayou Pierre, Homochitto River, Bahala Creek, and Fosters Creek.

The *oak-hickory* forest type is fourth in importance. This type is composed of forests in which upland oaks or hickories, singly or in combination, comprise a plurality of the stocking. However, where pines comprise 25 to 50 percent, the stand would be classified oak-pine. In 1977, the oak-hickory forest type was on approximately 65,000 acres, or 19 percent, of the woodland in the county. Common associates include yellow-poplar, maple, and elm.

The loblolly-shortleaf pine, oak-hickory, and oak-pine forest types occupy areas from lower slopes to upper slopes and ridges throughout the county. The oak-hickory forest type and the oak components of the oak-pine forest type occupy upland topographic positions, and the member species are generally referred to as upland hardwoods.

In terms of cubic feet of growing stock, board feet of saw timber, distribution, and acreages, individual species rate in the following order: loblolly pine, shortleaf pine, sweetgum, red oak species combined, white oak species combined, tupelo and blackgum combined, hickory, beech, red maple, elm species combined, yellow-poplar, and sugarberry.

Copiah County's forest land and harvested tree crops support a substantial timber economy in southwest Mississippi and a large number of wood-using industries in the county itself. Presently, there are five sawmills, one plywood and veneer mill, nine pulpwood dealers, and four secondary wood-using industries in the county (*9*).

Woodland understory vegetation

David W. Sanders, grassland conservationist, Soil Conservation Service, helped prepare this section.

Understory vegetation consists of grasses, forbs, shrubs, and other plants. Some woodland, if well managed, can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter. The density of the canopy determines the amount of light that understory plants receive.

Significant changes in kinds and abundance of plants occur as the canopy changes, often regardless of grazing use. For these reasons, the forage value rating of grazable woodland is not an ecological evaluation of the understory.

Forage value ratings are based on the percentage of the existing understory plant community made up of preferred and desirable plant species, as they relate to livestock palatability.

Table 8 shows, for each soil suitable for woodland use, the potential for producing understory vegetation. The total production of understory vegetation includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4 1/2 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

Table 8 also lists the common names of the characteristic vegetation on each soil and the percentage composition, by air-dry weight, of each kind of plant. The table shows the kind and percentage of understory plants expected under a canopy density that is most nearly typical of woodland in which the production of wood crops is highest.

Recreation

Ernest E. Dorrill, III, landscape architect, Soil Conservation Service, helped prepare this section.

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 visual 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

David R. Thomas, wildlife biologist, Soil Conservation Service, helped prepare this section.

The way land is used is the most important factor that affects the wildlife population. The kinds and numbers of wild animals in Copiah County have varied over the years.

Before Copiah County was settled, the area was predominantly forest. Upland hardwoods and mixed pine-hardwood stands were dominant in the hills, and bottom land hardwood forests were dominant in the flood plains along the streams. Under these conditions, forest animals were abundant. Some of these were squirrels, deer, turkey, bobcats, wolves, and many kinds of birds including the now extinct passenger pigeon.

As this area was settled, logging and land clearing for farming changed the animal population. Woodland wildlife was pushed back as the woodland was cleared, but wildlife on open and semi-open land flourished. Clearing of fields, logging, burning, and other disturbances of the soils created vegetative patterns that were good for bobwhite quail, rabbits, doves, many types of ground- and brush-inhabiting birds, rodents, and reptiles. Land clearing, particularly in the steeper areas, resulted in erosion. Silt and sand filled many of the streams, affecting the kinds and numbers of fish the streams were able to support.

Farming methods of the early settlers were responsible for the large bobwhite quail and rabbit populations. As the land clearing trend continued, the number of forest animals further declined. Wolves, panthers, and bears were eliminated and deer and turkey almost disappeared. Agricultural and industrial demands and methods continued to change. After World War II, reforestation and wildlife management efforts were accelerated. As a result of restocking and management efforts, deer and turkey have been restored.

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, oats, and soybeans.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, bahiagrass, ryegrass, clover, and annual lespedeza (fig. 9).

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 paspalums, goldenrod, and beggarweed.

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, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, 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 eastern redcedar.

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 hollies, huckleberry, hydrangea, and American beautyberry.

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

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are

Figure 9.—For food and cover in a wildlife habitat, red clover, wheat, and lespedeza are grown on Loring silt loam, 2 to 5 percent slopes, eroded.

created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are 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, 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, woodchuck, songbirds, woodpeckers, squirrels, gray fox, raccoon, and deer.

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

Engineering

William A. Walker, 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 before 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, 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, 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, and local roads and streets. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by a very firm dense layer; 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, 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. 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.

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 (fig. 10).

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, and flooding affect absorption of the effluent. Large stones 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 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

Figure 10.—Animal waste lagoon constructed on Providence silt loam, 5 to 8 percent slopes, eroded.

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, flooding, large stones, and content of organic matter.

Excessive seepage caused by 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 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, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock 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 may be wet, and the depth to the water table may be 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 organic matter. A high water table affects the amount of usable material. It also affects trafficability.

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

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 other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers;

and potential frost action. Excavating and grading and the stability of ditchbanks are affected by large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

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, and large stones affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

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

Soil properties

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

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. 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 GM, GC, SP, SM, and SC; and silty and clayey soils as ML, CL, MH, and CH. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

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

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. 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. 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 (fig. 11). 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.

Figure 11.—Cracks in house that was constructed on Kolin silt loam, 2 to 5 percent slopes, eroded, which has high shrink-swell potential.

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, by runoff from adjacent slopes, or by tides. 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.

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.

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 analyses of selected soils

D. E. Pettry, agronomist, Department of Agronomy, Mississippi Agricultural and Forestry Experiment Station, Mississippi State University, prepared this section.

The results of physical analyses of several pedons in the survey area are given in table 18. The data are for soils sampled from pits at carefully selected sites. All the pedons except the Bude pedon are described as typical for the series in the section "Soil series and their morphology." Soil samples were analyzed by the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station.

The samples were prepared for analysis by air-drying, carefully crushing, and screening through a standard 20-mesh sieve. Particle size analyses shown in table 18 were obtained using Day's hydrometer method (*4*). Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis.

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).

Soils with high silt content in the surface layer, such as Ariel, Arkabutla, Bude, Grenada, Loring, and Memphis soils, have a tendency to pack when cultivated. A crust forms on the surface of these silty soils in intensively cultivated areas. This may hinder plant emergence. A crust also forms on the surface of the associated Providence soils, which contain a hard, dense fragipan in the upper 40 inches.

The deep, steep Smithdale and Saffell soils have relatively high sand content. The coarse textured surface layers enhance rapid water infiltration, and the soils tend to be droughty. Saffell soils have a higher gravel content that affects available water capacity and physical properties. The Lorman soils have higher clay content in the subsoil and lower water infiltration capacity.

The Kolin and Lorman soils have high content of montmorillonite clay. The expansive clay shrinks and swells upon wetting and drying. These soils are very unstable as foundation material for buildings and roads.

Soil chemical properties in combination with other soil features such as permeability, structure, texture, and consistence, influence the limitations and potentials of any soil. Chemical properties are not evident in visual observations of a soil; laboratory analyses are necessary to define the 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 hold cations. Cations are elements that have a positive charge and that are bonded to clay minerals and organic matter that have a negative charge. The montmorillonite clay in the Kolin and Lorman soils has a high capacity to retain cations.

The Soil Taxonomy (*8*) classification system used in the National Cooperative Soil Survey makes use of chemical soil properties as differentiating criteria in some categories of the system. The Alfisol and Ultisol orders, which are classes in the highest category in the system, are separated on the basis of percentage base saturation deep in the subsoil. Ultisols have base saturation less than 35 percent in the lower part of the soil, whereas in Alfisols, such values are greater than 35 percent. For example, Lorman soils have base saturation levels greater than 35 percent, and they are Alfisols. The degree of weathering is inversely related to base saturation because base saturation is a measure of the extent of the replacement of bases by hydrogen 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, Miss.

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

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM); 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 (*8*). 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 Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquents (*Hapl*, meaning minimal horizonation, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplaquents.

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

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

Soil series and their morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*7*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*8*). 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."

Ariel series

The Ariel series consists of well drained soils that formed in silty alluvium on flood plains. Slopes range from 0 to 2 percent. Ariel soils are coarse-silty, mixed, thermic Fluventic Dystrochrepts.

Ariel soils are associated with Bruno, Bude, Gillsburg, Oaklimeter, and Providence soils. Bruno soils are on flood plains and have stratified sandy C horizons. Gillsburg soils, which are in slightly lower positions on flood plains, have gray matrix colors within 20 inches of the surface. Oaklimeter soils, which are in similar positions on flood plains, have mottles of chroma 2 or less within 24 inches of the surface. Providence and Bude soils, which are in higher positions on stream terraces and uplands, have a fragipan.

Typical pedon of Ariel silt loam, in pasture, 1 1/2 miles south of Dentville on county road, 2 miles west on intersecting county road, and about 100 feet west of county road, NW1/4NE1/4 sec. 10, T. 1 N., R. 4 W.

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

B2—6 to 27 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; silt or oxide coatings on faces of peds; few brown concretions and few fine faint pale brown (10YR 6/3) mottles in lower horizon; strongly acid; clear smooth boundary.

A2b—27 to 42 inches; mottled pale brown (10YR 6/3), yellowish brown (10YR 5/6), and light brownish gray (10YR 6/2) silt loam; friable; weak medium subangular blocky structure; common fine pores; few black and brown concretions; strongly acid; clear smooth boundary.

B2b—42 to 64 inches; mottled light brownish gray (10YR 6/2), dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/6) silt loam; weak coarse prismatic parting to weak medium subangular blocky structure; friable; slightly compact; few tongues of gray silt between prisms; common fine black and brown concretions; strongly acid.

The thickness of solum is 60 inches or more. Depth to a buried solum varies from 20 to 40 inches. Reaction is very strongly acid or strongly acid throughout except where the surface has been limed.

The Ap horizon is brown, dark brown, or dark grayish brown.

The B horizon is dark brown, brown, yellowish brown, or dark yellowish brown.

The A2b horizon is pale brown, grayish brown, light brownish gray, or mottled in shades of gray and brown.

The Bb horizon is mottled in shades of gray and brown or has brownish matrix colors with few to many gray mottles.

Arkabutla series

The Arkabutla series consists of somewhat poorly drained soils that formed in silty alluvium in narrow depressional areas of the broad flood plains. Slopes range from 0 to 2 percent. Arkabutla soils are fine-silty, mixed, acid, thermic Aeric Fluvaquents.

Arkabutla soils are associated with Cahaba, Columbus, and Guyton soils. Cahaba and Columbus soils, which are in higher positions on stream terraces, have argillic horizons. Guyton soils, which are in the same depressional areas of flats and stream terraces, are poorly drained and have Bt horizons.

Typical pedon of Arkabutla silt loam, in a narrow depressional wooded area 1 mile east of Hopewell, on county road, 1/2 mile north on field road and 50 feet west of road, NE1/4NW1/4 sec. 4, T. 1 N., R. 1 E.

A1—0 to 5 inches; dark brown (10YR 4/3) silt loam; common fine faint pale brown (10YR 6/3) mottles; weak fine granular structure; friable; few fine roots; strongly acid; abrupt smooth boundary.

B21—5 to 18 inches; mottled dark yellowish brown (10YR 4/4) and light brownish gray (10YR 6/2) silt loam; weak fine subangular blocky structure; friable, slightly plastic; few fine roots; few black concretions; strongly acid; clear smooth boundary.

B22g—18 to 48 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable, slightly plastic; few black concretions; strongly acid; clear wavy boundary.

B23g—48 to 70 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; strongly acid.

The thickness of the solum is 40 inches or more. Reaction is very strongly acid or strongly acid throughout except where the surface has been limed.

The A1 horizon is dark brown, brown, or dark yellowish brown.

The B21 horizon is dark grayish brown or grayish brown or 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 brownish gray, or gray and is mottled in shades of brown. Texture is silty clay loam or silt loam.

Bruno series

The Bruno series consists of excessively drained soils that formed in sandy alluvium on flood plains. These soils are subject to frequent flooding. Slopes range from 0 to 3 percent. Bruno soils are sandy, mixed, thermic Typic Udifluvents.

Bruno soils are associated with the Ariel, Latonia, Oaklimeter, and Velda soils. Ariel and Oaklimeter soils, which are in lower positions on the flood plains, have a coarse-silty control section and are not as well drained. Latonia soils, which are on higher places on natural levees of the Pearl River, have an argillic horizon. Velda soils are on broad areas of the flood plain along the Pearl River and have a coarse-silty control section.

Typical pedon of Bruno sandy loam, in an area of mixed hardwoods on natural levee of Pearl River; turn south, off Highway 27 on gravel road 1/4 mile west of Pearl River bridge, go south 1 mile, and east about 1,000 feet, SE1/4SW1/4 sec. 7, T. 10 N., R. 11 E.

A1—0 to 7 inches; dark brown (10YR 4/3) sandy loam; weak fine granular structure; many fine roots; strongly acid; clear smooth boundary.

C1—7 to 13 inches; brown (10YR 5/3) loamy sand with thin strata or bedding planes of dark grayish brown (10YR 4/2) loamy fine sand; single grained; loose; common fine roots; strongly acid; clear smooth boundary.

C2—13 to 50 inches; pale brown (10YR 6/3) loamy sand; single grained; loose; thin bedding planes of dark yellowish brown (10YR 4/4) loamy very fine sand; few fine roots; strongly acid; clear smooth boundary.

C3—50 to 70 inches; pale brown (10YR 6/3) sand; single grained; loose; medium acid.

Reaction ranges from strongly acid to medium acid throughout except where the surface has been limed. Thin bedding planes are evident throughout.

The A horizon is brown, dark brown, or dark grayish brown.

The C horizon is dark grayish brown, brown, light brownish gray, pale brown, or dark yellowish brown. Texture is loamy sand or sand that has thin strata of sandy loam, silt loam, loam, or loamy very fine sand.

Bude series

The Bude series consists of somewhat poorly drained soils that have a fragipan and that formed in silty material and underlying loamy material on broad stream terraces and uplands. Slopes range from 0 to 2 percent. Bude soils are fine-silty, mixed, thermic Glossaquic Fragiudalfs.

Bude soils are associated with Ariel, Gillsburg, and Providence soils. Providence soils, which are also on uplands and stream terraces, are moderately well drained and do not have gray mottles in the upper 16 inches. Also, Providence soils do not have A'2 horizons. Ariel and Gillsburg soils are on flood plains and do not have a fragipan.

Typical pedon of Bude silt loam, 0 to 2 percent slopes, 4 miles southeast of Hazlehurst on Stronghope Road, then south 100 feet in pasture, SE1/4SE1/4 sec. 32, T. 10 N., R. 9 E.

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

B2—5 to 18 inches; mottled light yellowish brown (10YR 6/4), light brownish gray (10YR 6/2), and brownish yellow (10YR 6/6) silt loam; weak fine and medium subangular blocky structure; friable; many fine pores; few fine black and brown concretions; strongly acid; clear smooth boundary.

Bx'&A'2—18 to 23 inches; mottled light brownish gray (10YR 6/2), yellowish brown (10YR 5/6), and grayish brown (10YR 5/2) silt loam; weak fine and medium subangular blocky structure; firm, slightly compact and brittle; some clay films on brown portion; gray silt coatings around peds, about 15 percent; few black and brown concretions; strongly acid; clear smooth boundary.

B'x2—23 to 36 inches; mottled yellowish brown (10YR 5/8), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/8) silt loam; moderate medium subangular blocky structure; firm, compact and brittle; clay films on faces of peds; gray silt coatings on faces of peds; vertical cracks of gray; strongly acid; gradual smooth boundary.

IIB'x3—36 to 64 inches; mottled brownish yellow (10YR 6/8), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/8) silt loam with high sand content; moderate medium subangular blocky structure; firm, compact and brittle; clay films on faces of peds, gray silt coatings on faces of peds; vertical cracks of gray; strongly acid.

Depth to the fragipan ranges from 18 to 24 inches. Reaction is very strongly acid or strongly acid throughout except where the surface horizon has been limed.

The A horizon is dark brown or dark yellowish brown.

The B horizon is strong brown, yellowish brown, or dark yellowish brown or is mottled in shades of yellow, brown, and gray. Texture is silt loam or silty clay loam.

The Bx' and A'2 horizons are mottled in shades of gray, yellow, and brown. In some pedons, the A' horizon is gray.

The B'x horizon is gray, light brownish gray, or mottled in shades of yellow, brown, and gray. Texture is silt loam or silty clay loam, and within a depth of 48 inches of the surface, sand content is more than 15 percent.

These soils in Copiah County have slightly less clay in the control section than is allowed for the series. For this reason, they are correlated as taxadjuncts to the Bude series.

Cahaba series

The Cahaba series consists of well drained soils formed in loamy and sandy materials on stream terraces. Slopes range from 0 to 5 percent. Cahaba soils are fine-loamy, siliceous, thermic Typic Hapludults.

Cahaba soils are associated with Arkabutla, Columbus, and Latonia soils. Arkabutla soils are in narrow depressional areas of flood plains and do not have an argillic horizon. Columbus soils, which are on similar stream terrace positions, are moderately well drained. Latonia soils, which are on natural levees of the Pearl River flood plain, have a thick sandy epipedon.

Typical pedon of Cahaba sandy loam, 0 to 2 percent slopes, about 1 mile north of Georgetown on Highway 27 and east 100 yards in field, SE1/4NW1/4 sec. 35, T. 1 N., R. 1 E.

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

B1—6 to 14 inches; reddish brown (5YR 4/4) sandy loam; weak fine and medium subangular blocky structure; friable; few roots; strongly acid; gradual smooth boundary.

B21t—14 to 29 inches; yellowish red (5YR 5/6) sandy clay loam; few fine distinct light yellowish brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; clay films on faces of peds; clay bridging of sand grains; strongly acid; gradual smooth boundary.

B22t—29 to 35 inches; yellowish red (5YR 4/6) sandy clay loam; few fine distinct light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; friable; clay films on faces of peds; clay bridging of sand grains; strongly acid; gradual smooth boundary.

B3—35 to 46 inches; strong brown (7.5YR 5/6) sandy loam; weak medium subangular blocky structure; friable; clay bridging of sand grains; strongly acid; abrupt smooth boundary.

C—46 to 80 inches; light yellowish brown (10YR 6/4) loamy sand; single grained; loose; strongly acid.

The thickness of the solum ranges from 36 to 50 inches. Reaction is very strongly acid or strongly acid throughout except where the surface has been limed.

The A horizon is dark grayish brown, dark brown, brown, or grayish brown.

In some pedons, the A and B horizons are mixed brown and yellowish red. In other pedons a reddish brown or yellowish red B1 horizon is present.

The Bt horizon is yellowish red or red. Texture is sandy clay loam or clay loam.

The C horizon ranges from brown to red and is commonly sand or loamy sand.

Calloway series

The Calloway series consists of somewhat poorly drained soils that have a fragipan. These soils formed in silty material on broad uplands and stream terraces. Slopes range from 0 to 2 percent. Calloway soils are fine-silty, mixed, thermic Glossaquic Fragiudalfs.

Calloway soils are associated with Grenada, Loring, and Providence soils on uplands and stream terraces. Grenada, Loring, and Providence soils are better drained than Calloway soils and do not have gray mottles in the upper 16 inches. Providence and Loring soils do not have an A'2 horizon.

Typical pedon of Calloway silt loam, 0 to 2 percent slopes, west of Carpenter 1 1/2 miles on Highway No. 18, north 1 mile, 1/2 mile west on county road, and 200 yards south, in pasture, NW1/4NE1/4 sec. 16, T. 12 N., R. 5 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; common few fine faint pale brown (10YR 6/3) mottles; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

B2—6 to 20 inches; yellowish brown (10YR 5/4) silt loam; common fine and medium light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; many fine roots; common black concretions; strongly acid; clear wavy boundary.

B'x&A'2—20 to 38 inches; yellowish brown (10YR 5/8) silt loam (B'x) and light brownish gray (10YR 6/2) silt loam (A'2); weak medium subangular blocky structure; the B'x part is brittle, firm; many fine black and brown concretions; strongly acid; gradual wavy boundary.

B'x2—38 to 64 inches; mottled yellowish brown (10YR 5/8), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; brittle, compact in approximately 60 percent of volume; patchy clay films on faces of peds; common fine black and brown concretions; strongly acid.

The thickness of the solum is 60 inches or more.

Depth to the fragipan ranges from 18 to 28 inches. Reaction ranges from very strongly acid to medium acid in the surface layer and upper part of the subsoil and from strongly acid to neutral in the the lower part except where the surface has been limed.

The Ap horizon is dark grayish brown or brown.

The B horizon is dark yellowish brown, light yellowish brown, or yellowish brown and has mottles in shades of gray. Texture is silt loam or silty clay loam.

The Bx1&A'2 horizon is light brownish gray, pale brown, or yellowish brown.

The B'x horizon is mottled in shades of brown, gray, or yellow. Texture is silt loam or silty clay loam.

Columbus series

The Columbus series consists of moderately well drained soils that formed in loamy material on broad stream terraces. Slopes range from 0 to 2 percent. Columbus soils are fine-loamy, siliceous, thermic Aquic Hapludults.

Columbus soils are associated with Arkabutla, Cahaba, and Guyton soils. Arkabutla soils, which are in narrow depressional areas of flood plains, have a fine-silty control section. Cahaba soils, which are in the higher positions on stream terraces, do not have mottles of chroma 2 or less. Guyton soils, which are on broad to depressional flats and stream terraces, have a fine-silty control section and a matrix of chroma 2 or less within 5 inches of the surface.

Typical pedon of Columbus silt loam, 0 to 2 percent slopes, 1 mile northeast of Egypt Hill on dirt road and north 30 feet, in field, NE1/4NE1/4 sec. 18, T. 2 N., R. 1 E.

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

B21t—6 to 18 inches; dark brown (7.5YR 4/4) clay loam; moderate fine and medium subangular blocky structure; firm, slightly plastic; few fine roots; clay coating and bridging of sand grains; strongly acid; abrupt smooth boundary.

B22t—18 to 23 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular blocky structure; friable; clay films on faces of peds; strongly acid; clear wavy boundary.

B23t—23 to 35 inches; mottled yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm to friable; few fine pores; clay films on faces of peds; few fine black and brown concretions; strongly acid; gradual wavy boundary.

B3—35 to 42 inches; mottled yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and pale brown (10YR 6/3) sandy loam; weak medium subangular blocky structure; patchy clay films; uncoated sand pockets; common black and brown concretions; few gravels; very strongly acid; gradual wavy boundary.

IIC1—42 to 75 inches; yellowish brown (10YR 5/4) loamy sand; single grained; loose; few black and brown concretions; very strongly acid.

The thickness of the solum ranges from 35 to 60 inches. Reaction is very strongly acid or strongly acid throughout except where the surface has been limed.

The A horizon is dark brown, brown, or dark grayish brown.

The B21t horizon is yellowish brown, dark yellowish brown, or dark brown. Texture is clay loam, loam, or sandy clay loam.

The B22t and B23t horizons are yellowish brown, dark yellowish brown, or strong brown or are mottled in shades of brown, gray, or red. Texture is clay loam, loam, or sandy clay loam.

The B3 horizon is light brownish gray or grayish brown or is mottled in shades of gray and brown. Texture is sandy clay loam, loam, or sandy loam.

The IIC horizon is yellowish brown or pale brown or is mottled in shades of gray or yellowish brown. Texture is loamy sand or sand.

Gillsburg series

The Gillsburg series consists of somewhat poorly drained soils that formed in silty alluvium on broad flood plains. Slopes range from 0 to 2 percent. Gillsburg soils are coarse-silty, mixed, acid, thermic Aeric Fluvaquents.

The Gillsburg soils are associated with Ariel, Bude, and Oaklimeter soils. Ariel and Oaklimeter soils are in higher positions on flood plains, are better drained than Gillsburg soils, and do not have gray mottles in the upper 20 inches. Bude soils have a fragipan and are on uplands and on stream terrace positions.

Typical pedon of Gillsburg silt loam, 3 miles west on Highway 28 and 200 feet north in pasture, SW1/4SE1/4 sec. 12, T. 10 N., R. 7 E.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint pale brown (10YR 6/3) mottles; weak fine granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

B21—4 to 14 inches; dark brown (10YR 4/3) silt loam; common medium distinct pale brown (10YR 6/3) mottles; weak fine and medium subangular blocky structure; few coatings of silt and oxides on faces of peds; common fine roots; few black and brown concretions; strongly acid; gradual smooth boundary.

B22—14 to 26 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable, slighty brittle; few roots; few coatings of silt and oxides on faces of peds; common soft black and brown concretions; strongly acid; clear, irregular boundary.

A&B—26 to 34 inches; grayish brown (10YR 5/2) silt loam (A) and yellowish brown (10YR 5/6) silt loam (B); weak coarse prismatic structure parting to weak medium subangular blocky; friable; clay films on faces of peds; few black and brown concretions; strongly acid; gradual wavy boundary.

Btgb—34 to 64 inches; gray (10YR 6/1) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; slightly brittle; clay films on faces of peds; gray tongues of silt loam 2 inches wide between prisms; few black and brown concretions; strongly acid.

The depth to the buried soil ranges from 20 to 50 inches. Reaction is very strongly acid or strongly acid except where the surface has been limed.

The A1 horizon is dark grayish brown, brown, or dark brown.

The B21 horizon is dark brown or dark yellowish brown or is mottled in shades of gray or brown.

The B22 horizon is grayish brown, light brownish gray, or gray or is mottled in shades of brown or gray.

The buried soil horizons are similar in color to those of the B22 horizon. Texture is silt loam or silty clay loam.

Grenada series

The Grenada series consists of moderately well drained soils that have a fragipan and that formed in silty material on broad uplands and stream terraces. Slopes range from 0 to 2 percent. Grenada soils are fine-silty, mixed, thermic Glossic Fragiudalfs.

Grenada soils are associated with Calloway, Loring, and Providence soils. Calloway soils, on uplands and stream terraces, are more poorly drained and have gray mottles in the upper 16 inches. Loring and Providence soils, on uplands and stream terraces, do not have a grayish A'2 horizon above the fragipan. Providence soils have more sandy material in the lower part of the fragipan.

Typical pedon of Grenada silt loam, 0 to 2 percent slopes, 1 mile south of Peetsville on old Jackson Road and left 200 feet in soybean field, SE1/4NW1/4 sec. 36, T. 9 N., R. 6 E.

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

B21—7 to 16 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few fine black concretions; common fine and medium roots; very strongly acid; gradual smooth boundary.

B22—16 to 22 inches; yellowish brown (10YR 5/6) silt loam; few fine faint brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; friable; common medium and fine black and dark brown concretions; thin pale brown silt coats on faces of peds; very strongly acid; abrupt wavy boundary.

A'2&B'x1—22 to 27 inches; pale brown (10YR 6/3) silt loam (A'2), and yellowish brown (10YR 5/8) silt loam (B'x1); 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'x2—27 to 38 inches; mottled strong brown (7.5YR 5/6), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/8) silty clay loam; 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'x3—38 to 64 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) and brown (10YR 5/3) 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 in the surface layer and the upper part of the subsoil except where the surface has been limed. Reaction of the lower part of the subsoil is strongly acid or medium acid.

The A horizon is grayish brown, brown, dark brown, or yellowish brown.

The B21 and B22 horizons are dark yellowish brown or yellowish brown. Texture is silt loam or silty clay loam.

The A'2&B'x1 horizon is light gray, light brownish gray, or pale brown and is generally mottled with shades of brown. In some pedons, this is an A'2 horizon.

The B'x horizon is dark yellowish brown, yellowish brown, or brown; or it is mottled in shades of gray and brown; or it is mottled in shades of gray, brown, and yellow. Texture is silty clay loam or silt loam.

Guyton series

The Guyton series consists of poorly drained soils that formed in silty material on broad flats and stream terraces that are subject to frequent flooding. Slopes range from 0 to 1 percent. Guyton soils are fine-silty, siliceous, thermic Typic Glossaqualfs.

Guyton soils are associated with Arkabutla, Columbus, Oaklimeter, and Velda soils. Arkabutla soils, which are in the narrow depressional areas of broad flood plains, have a fine-silty control section and are somewhat poorly drained. Columbus soils on stream terraces and Velda soils on flood plains are on the higher lying convex ridges and are better drained soils containing sandy material. Oaklimeter soils on flood plains have a browner upper part of the subsoil that is less than 18 percent clay.

Typical pedon of Guyton silt loam, 1 mile north of Lawrence County line on Mississippi Highway 27, east across railroad track 1 1/2 miles, and southeast 200 yards in pasture, SE1/4NE1/4 sec. 13, T. 9 N., R. 10 E.

Ap—0 to 4 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

A2g—4 to 19 inches; light gray (10YR 7/1) silt loam; common medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; strongly acid; abrupt irregular boundary.

A&B—19 to 29 inches; light gray (10YR 7/1) silt loam (A) and yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) silt loam (B); weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; gray silt tongues 1 to 3 inches thick occurring every 4 to 6 inches; few roots; strongly acid; clear irregular boundary.

B21tg—29 to 50 inches; light brownish gray (2.5Y 6/2) silt loam; weak coarse prismatic structure parting to weak medium subangular blocky; friable, slightly brittle; continuous clay films on faces of peds; gray silt tongues 1 to 3 inches thick occurring every 4 to 6 inches; common black and brown concretions; strongly acid; clear irregular boundary.

B22tg—50 to 58 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/8) and strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; friable, slightly brittle; continuous clay films on faces of peds; gray silt tongues; common black and brown concretions; strongly acid; clear irregular boundary.

B3tg—58 to 77 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; friable; clay films on faces of peds; tonguing of gray silt; strongly acid.

The thickness of the solum ranges from 52 to 80 inches. These soils do not have a natric horizon, but exchangeable sodium ranges from 10 to 40 percent in the lower part of the solum. Reaction is very strongly acid or strongly acid in A and B2 horizons and ranges from strongly acid to neutral in the B3g horizon.

The A and A2g horizons are light brownish gray, light gray, brown, dark brown, dark grayish brown, or mottled in these shades.

The A&B horizon is light brownish gray or light gray mottled with shades of brown. The texture is silt loam or silty clay loam.

The B2tg horizon is grayish brown, light brownish gray, or gray and has mottles in shades of brown. Texture is silt loam or silty clay loam.

The B3g horizon is grayish brown, light brownish gray, or gray and has mottles in shades of brown. Texture is silt loam, silty clay loam, or clay loam.

Kolin series

The Kolin series consists of moderately well drained soils that formed in silty materials underlain by clayey sediments on broad terraces and uplands. Slopes range from 2 to 8 percent. Kolin soils are fine-silty, siliceous, thermic Glossaquic Paleudalfs.

Kolin soils are associated with Lorman, Providence, and Smithdale soils on the same landscape. Lorman soils, on upland side slopes, have a clayey subsoil. Providence soils, on uplands and stream terraces, have a fragipan. Smithdale soils, on upland side slopes, have a fine-loamy control section.

Typical pedon of Kolin silt loam, 2 to 5 percent slopes, eroded, 2 miles south of Hazlehurst on U.S. Highway 51 and 300 feet east in pasture, SE1/4SW1/4 sec. 21, T. 10 N., R. 8 E.

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

B21t—7 to 14 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; few fine roots; strongly acid; gradual wavy boundary.

B22t—14 to 26 inches; strong brown (7.5YR 5/6) silt loam; common medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; patchy clay films and coating of clay; some compact and brittle areas; strongly acid; gradual wavy boundary.

B&A'2—26 to 34 inches; strong brown (7.5YR 5/6) silt loam (B23t) and 15 percent light brownish gray (10YR 6/2) silt loam (A'2); moderate medium prismatic structure parting to moderate medium subangular blocky; few gravels; strongly acid; abrupt smooth boundary.

IIB24t—34 to 67 inches; strong brown (7.5YR 5/8) silty clay; common medium prominent gray (10YR 6/1) mottles; moderate fine and medium angular blocky structure; firm, plastic and sticky; clay films; slightly acid; gradual wavy boundary.

IIC—67 to 75 inches; light brownish gray (2.5Y 6/2) silty clay; common fine prominent yellowish brown (10YR 5/6) mottles; massive; few siltstones; slightly acid.

Depth to IIBt horizon ranges from 20 to 40 inches. Reaction of the surface layer ranges from very strongly acid to slightly acid except where surface has been limed. The upper part of the subsoil ranges from very strongly acid to medium acid. The lower part of the subsoil and underlying material ranges from very strongly acid to slightly acid.

The Ap horizon is dark grayish brown, brown, or dark brown.

The Bt horizon is strong brown, yellowish brown, or reddish yellow. Texture is silt loam or silty clay loam.

The IIBt horizon is strong brown or yellowish red and is mottled in shades of gray. Texture is silty clay or clay.

The IIC horizon is strong brown, yellowish red, or light brownish gray and is mottled in shades of gray and brown. Texture is clay or silty clay.

Latonia series

The Latonia series consists of well drained loamy soils that formed in sandy sediments on natural levees of the Pearl River flood plains. Slopes range from 0 to 5 percent. Latonia soils are coarse-loamy, siliceous, thermic Typic Hapludults.

Latonia soils are associated with Bruno and Cahaba soils. Bruno soils, which are on flood plains, do not have a Bt horizon. Cahaba soils, which are on stream terraces, do not have a thick sandy epipedon.

Typical pedon of Latonia loamy sand, 0 to 5 percent slopes, along the Pearl River in the extreme northeastern part of Copiah County; turn off county road and go 1/4 mile along river on field road in pasture, NE1/4NE1/4 sec. 6, T. 2 N., R. 1 E.

A1—0 to 8 inches; dark brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; few fine roots; strongly acid; abrupt smooth boundary.

B21t—8 to 35 inches; yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; very friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.

B3—35 to 45 inches; yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; sandy grains bridged and coated with clay; very friable; strongly acid; abrupt smooth boundary.

IIC1—45 to 80 inches; pale brown (10YR 6/3) loamy sand; single grained; loose; strongly acid.

The thickness of the solum ranges from 20 to 45 inches. Reaction is very strongly acid or strongly acid except where surface has been limed.

The A1 horizon is dark grayish brown, dark brown, or brown.

The B2t and B3 horizons are dark yellowish brown or yellowish brown. Texture is sandy loam or fine sandy loam.

The IIC horizon is variable in color and ranges from pale brown to yellowish brown. Texture is loamy sand or sand.

Lax series

The Lax series consists of moderately well drained soils that have a fragipan and that formed in a mantle of silty material underlain by gravelly deposits on uplands. Slopes range from 2 to 5 percent. Lax soils are fine-silty, siliceous, thermic Typic Fragiudults.

Lax soils are associated with Providence and Saffell soils. Providence soils, which are on uplands and stream terraces, do not have a gravelly fragipan. Saffell soils, which are steeper soils on side slopes, do not have a fragipan and are gravelly throughout.

Typical pedon of Lax silt loam, 2 to 5 percent slopes, eroded, 6 miles east of Hazlehurst on Highway 28 north, 3/4 mile north, and 100 feet in pasture, SE1/4NE1/4 sec. 27, T. 1 N, R. 1 W.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; few gravels; strongly acid; abrupt smooth boundary.

B21t—7 to 19 inches; strong brown (7.5YR 5/8) silty clay loam; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds, some oxide coatings; few fine roots; strongly acid; gradual smooth boundary.

B22t—19 to 25 inches; strong brown (7.5YR 5/6) silty clay loam; few medium faint light yellowish brown (10YR 6/4) mottles; moderate, medium subangular blocky structure; friable; patchy clay films on faces of peds; few fine roots; strongly acid; gradual wavy boundary.

IIBx1—25 to 34 inches; strong brown (7.5YR 5/6) gravelly silt loam; common medium distinct pale brown (10YR 6/3) and light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle; seams of gray silt in cracks; patchy clay films on faces of peds; about 20 percent gravel; strongly acid; gradual wavy boundary.

IIBx2—34 to 64 inches; strong brown (7.5YR 5/8) gravelly sandy clay loam; common medium distinct light yellowish brown (10YR 6/4) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm, compact and brittle in 70 percent of the mass; clay films on faces of peds; gray silt in cracks; about 40 percent gravel; strongly acid.

Depth to the fragipan ranges from 18 to 30 inches. Reaction is very strongly acid or strongly acid except where the surface has been limed.

The Ap horizon is dark grayish brown, brown, dark brown, or yellowish brown.

The Bt horizon is yellowish brown, brown, strong brown, or yellowish red. Texture is silt loam or silty clay loam.

The IIBx1 horizon is strong brown and is mottled in shades of gray or pale brown. Texture is gravelly silt loam or gravelly silty clay loam. Volume of gravel is from 10 to 25 percent.

The IIBx2 horizon is yellowish brown or strong brown and is mottled in shades of gray and brown. Texture is gravelly sandy clay loam or gravelly clay loam. Volume of gravel is from 35 to 70 percent.

Lexington series

The Lexington series consists of well drained soils that formed in a silty mantle and underlying loamy sediments. These soils are on uplands. Slopes range from 5 to 18 percent. Lexington soils are fine-silty, mixed, thermic Typic Paleudalfs.

Lexington soils are associated with Memphis and Smithdale soils. Memphis soils, on uplands, have less than 5 percent sand to a depth of more than 48 inches. Smithdale soils, on upland side slopes, have a fine-loamy control section.

Typical pedon of Lexington silt loam, in an area of Smithdale-Lexington association, hilly, 4 miles south of Carpenter on paved road, about 1 mile east off logging road on ridgetop in a wooded area, NE1/4NW1/4 sec. 19, T. 2 N., R. 4 W.

A1—0 to 6 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

B21t—6 to 31 inches; dark brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; patchy clay films; oxide coatings on faces of peds; strongly acid; gradual smooth boundary.

IIB31—31 to 50 inches; strong brown (7.5YR 5/6) sandy loam; moderate medium subangular blocky structure; friable; clay bridging on sand grains; few gravel; strongly acid; gradual wavy boundary.

IIB32—50 to 80 inches; yellowish red (5YR 5/8) sandy loam; weak medium subangular blocky structure; friable; some clay bridging on sand grains; strongly acid.

The thickness of the solum is 60 inches or more. Reaction is strongly acid or medium acid throughout except where the surface has been limed.

The A horizon is brown, yellowish brown, dark yellowish brown, or dark brown.

The Bt horizon is dark brown, dark yellowish brown, or strong brown. Texture is silt loam or silty clay loam.

The IIB3 horizon is reddish brown, strong brown, or yellowish red. Texture is sandy loam or loam.

Loring series

The Loring series consists of moderately well drained soils that have a fragipan and that formed in silty material on stream terraces and uplands. Slopes range from 2 to 12 percent. Loring soils are fine-silty, mixed, thermic Typic Fragiudalfs.

The Loring soils are associated with Calloway, Grenada, Memphis, and Smithdale soils. Calloway and Grenada soils, on broad uplands and stream terraces, have an A'2 horizon above the fragipan. Memphis soils, on uplands, do not have a fragipan. Smithdale soils, on upland side slopes, are loamy and do not have a fragipan.

Typical pedon of Loring silt loam, 2 to 5 percent slopes, eroded, 10 miles west of Hazlehurst on Barlow Road and about 200 feet north in pasture, SW1/4SE1/4 sec. 16, T. 10 N., R. 6 E.

Ap—0 to 7 inches; brown (7.5YR 5/2) silt loam; weak fine granular structure; friable; many fine and medium roots; medium acid; abrupt smooth boundary.

B21t—7 to 23 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.

Bx1—23 to 40 inches; strong brown (7.5YR 5/6) silt loam; common medium distinct brownish yellow (10YR 6/6), pale brown (10YR 6/3), 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 coats on faces of peds; common fine and medium vesicular pores; few fine dark brown and black concretions; strongly acid; gradual smooth boundary.

Bx2—40 to 68 inches; mottled strong brown (7/5YR 5/6), yellowish brown (10YR 5/6), and light brownish gray (10YR 6/2) silt loam; 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 coats on faces of peds; patchy clay films on faces of peds; few fine black concretions; strongly acid.

Depth to the fragipan ranges from 22 to 30 inches. The reaction ranges from very strongly acid to medium acid throughout except where the surface has been limed.

The A horizon is brown or yellowish brown.

The Bt horizon is brown, dark 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 and has mottles in shades of yellow, brown, and gray; or it is mottled in shades of yellow, brown, and gray. Texture is silt loam or silty clay loam.

Lorman series

The Lorman series consists of moderately well drained, very slowly permeable soils that formed in clayey sediments on hilly uplands. Slopes range from 8 to 35 percent. Lorman soils are fine, montmorillonitic, thermic Vertic Hapludalfs.

Lorman soils are associated with Kolin, Saffell, and Smithdale soils. Kolin soils, on broad terraces and uplands, have a silty mantle 2 to 3 feet thick over clay. Saffell soils are gravelly, and Smithdale soils have a fine-loamy control section and are on upland side slopes.

Typical pedon of Lorman fine sandy loam, 12 to 35 percent slopes, about 1 mile south of Hazlehurst on paved road to U.S. Interstate 55, and about 1/4 mile west in pine woodland, SW1/4NE1/4 sec. 16, T. 10 N., R. 8 E.

A1—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

B21t—8 to 28 inches; red (2.5YR 4/6) clay; common medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; strong to moderate fine and medium angular blocky structure; firm, sticky and plastic; clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—28 to 43 inches; mottled light olive gray (5Y 6/2) and yellowish red (5YR 5/6) clay; strong fine and medium angular blocky structure; firm, sticky and plastic; few thin clay films on vertical cracks and faces of peds; many slickenslides, few intersect; strongly acid; clear smooth boundary.

C—43 to 80 inches; light olive gray (5Y 6/2) silty clay; few fine prominent strong brown (7.5YR 5/6) mottles; massive; firm, slightly sticky; slightly acid; many siltstone fragments.

Reaction ranges from very strongly acid to slightly acid in the surface layer except where surface has been limed. The upper part of the B horizon is strongly acid, and the lower part is medium acid or slightly acid.

The A horizon is very dark gray, dark grayish brown, brown, or dark brown.

The B21t horizon is reddish brown, yellowish red, or red and has mottles of yellow, brown, and gray.

The B22t horizon is olive gray or light brownish gray and has yellowish and brownish mottles or is mottled in shades of red, brown, and gray.

The C horizon is olive gray or light brownish gray and has brownish or yellowish mottles. Texture is silty clay loam or silty clay that has few to many fragments of siltstone.

Memphis series

The Memphis series consists of well drained soils that formed in silty materials more than 48 inches in thickness on uplands. Slopes range from 2 to 10 percent. Memphis soils are fine-silty, mixed, thermic Typic Hapludalfs.

Memphis soils are associated with Loring and Lexington soils. Loring soils, on stream terraces and uplands, have a fragipan. Lexington soils, on uplands, have less than 48 inches of silty material over the underlying sandy material.

Typical pedon of Memphis silt loam, 2 to 5 percent slopes, eroded, 1 mile north of entrance to Camp Wesley Pine on gravel road and about 50 feet south in wooded area, NW1/4NW1/4 sec. 10, T. 1 N., R. 2 W.

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

B21t—6 to 27 inches; dark brown (7.5YR 4/4) silty clay loam; weak to moderate fine and medium subangular blocky structure; friable, slightly sticky; common fine roots; clay films on faces of peds; dark oxide coatings on some faces of peds; strongly acid; clear smooth boundary.

B22t—27 to 34 inches; brown (7.5YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; slightly sticky; few fine roots; few patchy clay films on faces of peds; few gray silt coatings between peds; strongly acid; clear smooth boundary.

B3—34 to 60 inches; brown (7.5YR 5/4) silt loam; weak medium subangular blocky structure; friable, slightly sticky; few patchy clay films on some faces of peds; gray silt coatings on faces of peds; strongly acid; clear smooth boundary.

C—60 to 80 inches; strong brown (7.5YR 5/6) silt loam; weak coarse subangular blocky structure; friable; gray silt coatings on some faces of peds; strongly acid.

The thickness of the solum ranges from 32 to 68 inches. Reaction ranges from very strongly acid to medium acid throughout except where the surface has been limed.

The A horizons are dark brown, brown, or dark grayish brown.

The Bt horizon is dark brown, brown, strong brown, or dark yellowish brown. Texture is silty clay loam or silt loam.

The C horizon is brown, strong brown, or dark yellowish brown.

Oaklimeter series

The Oaklimeter series consists of moderately well drained soils that formed in silty alluvium on broad flood plains. Slopes range from 0 to 2 percent. Oaklimeter soils are coarse-silty, mixed, thermic Fluvaquentic Dystrochrepts.

Oaklimeter soils are associated with Ariel, Bruno, Gillsburg, and Guyton soils. Ariel soils, on higher elevations of flood plains, are better drained and do not have gray mottles in the upper 20 to 30 inches. Bruno soils, on the highest ridges of flood plains, have less silt in the 10- to 40-inch control section and are better drained than Oaklimeter soils. Gillsburg soils, in lower positions of flood plains, are more poorly drained and are gray in the upper 20 inches. Guyton soils, on broad to depressional flats and stream terraces, are more poorly drained than Oaklimeter soils.

Typical pedon of Oaklimeter silt loam, 5 miles west of Hazlehurst on U.S. Highway 28, south on paved road 1 mile, and east 300 feet in pasture, NW1/4SW1/4 sec. 27, T. 10 N., R. 7 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; common medium faint pale brown (10YR 6/3) mottles; weak fine granular structure; friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

B21—7 to 15 inches; yellowish brown (10YR 5/4) silt loam; few fine faint pale brown 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—15 to 27 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2), dark yellowish brown (10YR 4/4), 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.

A&B—27 to 38 inches; mottled light gray (10YR 7/2) and light brownish gray (10YR 6/2) silt loam (A2b) and yellowish brown (10YR 5/6) silt loam (Bb); weak coarse prismatic structure parting to medium subangular blocky; friable; few fine vesicular pores; very strongly acid.

Btgb—38 to 64 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) and dark grayish brown (10YR 4/2) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; friable; many black and brown concretions; gray tongues of silt; patchy clay films; strongly acid.

The reaction is very strongly acid or strongly acid throughout except where the surface has been limed. Clay content of the 10- to 40-inch control section ranges from 7 to 18 percent.

The Ap horizon is brown, yellowish brown, dark yellowish brown, or dark grayish brown.

The B21 horizon is brown, dark brown, or yellowish brown. Grayish and brownish mottles range from none to common.

The B22 horizon is brown, dark brown, or yellowish brown and has many grayish mottles or is mottled in shades of gray and brown.

The A&B horizon is gray, light gray, light brownish gray, or grayish brown or is mottled in shades of brown and gray.

The Btgb horizon is gray or light brownish gray and has brownish or grayish mottles. Texture is silt loam or silty clay loam.

Providence series

The Providence series consists of moderately well drained soils that have a fragipan and that formed in a thin mantle of silty material and underlying loamy sediment on uplands and stream terraces. Slopes range from 2 to 8 percent. Providence soils are fine-silty, mixed, thermic Typic Fragiudalfs.

The Providence soils are associated with Ariel, Bude, Calloway, Grenada, Kolin, and Lax soils. Ariel soils, on flood plains, do not have a fragipan. Bude soils, on similar landscapes to those of Providence soils but in lower positions, have an A'2 horizon. Calloway soils, in lower positions on uplands and stream terraces, are more poorly drained and have less than 15 percent sand in the lower part of the fragipan. Grenada soils, on stream terraces and uplands, have an A'2 horizon above the fragipan and have less than 15 percent sand. Kolin soils, also in similar positions on the uplands and stream terraces, have a clayey substratum but do not have a fragipan. Lax soils, on upland ridges, have a gravelly fragipan.

Typical pedon of Providence silt loam, 2 to 5 percent slopes, eroded, 1 mile southeast of Gallman on county road and east 100 feet in pasture, SE1/4SE1/4 sec. 15, T. 1 N., R. 2 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

B21t—6 to 15 inches; strong brown (7.5YR 5/8) silty clay 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; strongly acid; gradual smooth boundary.

B22t—15 to 25 inches; strong brown (7.5YR 5/8) silty clay loam; common medium faint yellowish brown (10YR 5/6) 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 coats on faces of peds; very strongly acid; gradual smooth boundary.

Bx1—25 to 46 inches; strong brown (7.5YR 5/8) silt loam, containing 15 percent sand; common medium faint yellowish brown (10YR 5/4), and common medium distinct pale brown (10YR 6/3) 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—46 to 70 inches; yellowish red (5YR 5/8) clay loam; common medium distinct yellowish brown (10YR 5/6) 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; very strongly acid.

Reaction ranges from very strongly acid to medium acid throughout except where surface has been limed. Depth to the fragipan ranges from 18 to 28 inches.

The A horizon is dark grayish brown, brown, dark gray, yellowish brown, or dark brown.

The Bt horizon is strong brown, yellowish brown, or yellowish red. Texture is silty clay loam or silt loam. Clay content ranges from 20 to 30 percent in the B2t horizon.

The Bx horizon ranges from yellowish brown to yellowish red and has mottles in shades of gray, brown, and red. Texture of the upper part of the Bx horizon is silty clay loam or silt loam that contains sand. Texture of the lower part is sandy loam, sandy clay loam, or clay loam.

Saffell series

The Saffell series consists of well drained soils that formed in gravelly loamy and sandy materials on uplands. Slopes range from 12 to 40 percent. Saffell soils are loamy-skeletal, siliceous, thermic Typic Hapludults.

Saffell soils are associated with Lax, Lorman, and Smithdale soils. Lax soils, on upland ridgetops, have a fragipan. Lorman soils, on hillsides, have a fine, montmorillonitic subsoil. Smithdale soils, also on hillsides, have fine-loamy control sections.

Typical pedon of Saffell gravelly sandy loam, 17 to 40 percent slopes, 5 miles west of Strong Hope and 100 feet south in wooded area, SE1/4NE1/4 sec. 22, T. 9N., R. 10 E.

A1—0 to 7 inches; dark grayish brown (10YR 4/2) gravelly sandy loam; weak fine granular structure; friable; many fine roots; gravel 20 percent by volume; strongly acid; abrupt smooth boundary.

A2—7 to 16 inches; yellowish brown (10YR 5/4) gravelly sandy loam; weak fine granular structure; friable; many fine roots; gravel 20 percent by volume; strongly acid; abrupt smooth boundary.

B2t—16 to 35 inches; yellowish red (5YR 5/6) gravelly sandy clay loam; moderate fine and medium subangular blocky structure; friable; clay films on faces of peds; few fine roots; gravel 35 percent by volume; strongly acid; gradual wavy boundary.

B3—35 to 48 inches; strong brown (7.5YR 5/6) gravelly sandy loam; weak medium subangular blocky structure; friable; clay bridging on sand particles; quartz gravel 50 percent by volume; strongly acid.

C—48 to 80 inches; yellowish red (5YR 5/6) gravelly loamy sand; massive; friable; quartz gravel 50 percent by volume; strongly acid.

The thickness of the solum ranges from 35 to 60 inches. Gravel content in the B horizon varies from 35 to 65 percent by volume.

Reaction is very strongly acid or strongly acid throughout except where the surface has been limed.

The A1 horizon is dark grayish brown or brown. Texture is sandy loam or gravelly sandy loam.

The A2 horizon is brown or yellowish brown. Texture is sandy loam or gravelly sandy loam.

The B2t horizon is red, yellowish red, reddish brown, or strong brown. Texture is very gravelly loam, very gravelly fine sandy loam, gravelly sandy clay loam, or very gravelly sandy clay loam.

The B3 and C horizons have the same colors as the B2t horizon. Texture is gravelly loamy sand, gravelly sandy loam, or very gravelly sandy loam.

Smithdale series

The Smithdale series consists of well drained soils that formed in loamy sediments on hilly uplands. Slopes range from 5 to 40 percent. Smithdale soils are fine-loamy, siliceous, thermic Typic Paleudults.

Smithdale soils are associated with Kolin, Lexington, Loring, Lorman, and Saffell soils. Kolin soils, on uplands and stream terraces, have a silty mantle and are clayey in the lower part of the subsoil. Lexington soils have higher silt content in the upper 20 inches of the Bt horizon. Loring soils, on uplands, are more poorly drained, have a fragipan, and have silty textures. Lorman soils, on hillsides, have more than 30 percent clay throughout the control section. Saffell soils, on hillsides, contain a high percentage of gravel by volume.

Typical pedon of Smithdale sandy loam, 17 to 40 percent slopes, 1/2 mile west of Beauregard and south 200 feet in wooded area, NE1/4SW1/4 sec. 26, T. 9 N., R. 8 E.

A1—0 to 3 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; medium acid; abrupt smooth boundary.

A2—3 to 17 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

B21t—17 to 40 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—40 to 60 inches; red (2.5YR 5/8) sandy loam; moderate medium subangular blocky structure; friable; discontinuous clay films on faces of peds and sand grains are bridged with clay; few small pockets of very pale brown sand; few pockets of uncoated sand grains in lower part; few fine and medium roots; very strongly acid; gradual smooth boundary.

B23t—60 to 80 inches; yellowish red (5YR 5/8) sandy loam; weak medium subangular blocky structure; friable; sand grains bridged and coated with clay and oxides; few small pockets of uncoated sand grains; very strongly acid.

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

The A horizon is dark grayish brown, dark brown, yellowish brown, brown, or strong brown.

The Bt horizon is yellowish red or red. Texture of the upper part of the Bt horizon is clay loam, sandy clay loam, or loam. Clay content of the upper 20 inches of the Bt horizon ranges from 18 to 30 percent. Texture of the lower part of this horizon is loam or sandy loam that has few to many pockets of uncoated sand grains.

Velda series

The Velda series consists of well drained soils that formed in silty sediments on flood plains along the Pearl River. Slopes range from 0 to 2 percent. Velda soils are coarse-silty, siliceous, thermic Fluventic Dystrochrepts.

Velda soils, associated with Bruno and Guyton soils. Bruno soils, on flood plains near stream channels, have sandy control sections. Guyton soils, in the depressional flats and on stream terraces, are poorly drained.

Typical pedon of Velda very fine sandy loam, 2 miles southeast of Rockport on sugar farm, south on field road at barn, about 1 mile, in pasture, SW1/4SW1/4 sec. 5, T. 9 N., R. 11 E.

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

B21—6 to 24 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine and medium subangular blocky structure; friable; common fine roots; strongly acid; gradual smooth boundary.

B22—24 to 46 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; friable; few fine roots; strongly acid; clear wavy boundary.

B23—46 to 55 inches; yellowish brown (10YR 5/4) very fine sandy loam; few, fine faint pale brown mottles; weak medium subangular blocky structure; friable; strongly acid; abrupt smooth boundary.

C—55 to 74 inches; pale brown (10YR 6/3) loamy fine sand; thin strata of yellowish brown (10YR 5/6) sandy loam; structureless; friable; strongly acid.

The thickness of the solum ranges from 30 to 55 inches. Clay content of the 10- to 40-inch control section is 10 to 18 percent. Reaction is very strongly acid or strongly acid throughout except where the surface has been limed.

The A1 horizon is dark brown, dark yellowish brown, or brown.

The B horizon is yellowish brown or dark yellowish brown. The texture is dominantly silt loam or very fine sandy loam. The lower part of the B horizon has pale brown mottles.

The C horizon is yellowish brown, pale brown, brown, or dark brown. The texture is silt loam, fine sandy loam, or loamy fine sand.

Formation of the soils

Soils range in thickness from a few inches in some locations to several feet in others. They vary in color, texture, fertility, and other properties, although they are mainly a mixture of minerals, organic matter, water, and air.

In the following paragraphs, the factors that affect the formation of soils and the processes of soil formation are described.

Factors of soil formation

Different kinds of soils result from the action and interaction of climate and living organisms acting on soil parent materials as conditioned by relief and drainage over a long period. A soil at any location has been formed under the influence of these five factors: parent material, climate, relief and drainage, living organisms, and time. The relative influence of each factor varies with the environment from place to place.

In Copiah County, parent materials have had a strong influence on the nature of the soils. This is evident in the differences between soils in two distinct land resource areas in the county. Also, visible and measureable soil properties reflect the influence of relief and drainage, such as the gray colors of Guyton soils.

Soil development has two major steps or parts. First, soil materials accumulate or are deposited, and next, the horizons form to create definite soil profiles. The horizons emerge slowly as changes occur in the parent material. Thus, some profiles have faint horizons, some have distinct horizons, and some have prominent ones. Under favorable conditions, horizons change from faint to distinct with the passage of time, and they increase in number. The number and distinctness of horizons enable soil scientists to determine the age of a soil, or the stage of development it has reached.

Parent material

The parent material exposed at the surface in Copiah County is commonly assigned to the Miocene, Pleistocene, and Recent series (*3*). Materials found at the surface are classified as clastic sediment that is composed of clay, silt, sand, and gravel. These sediments were deposited in deltaic, fluvial, and eolian environments. The Miocene strata generally dip to the south with minor local variations. Pleistocene and Recent sediments do not show true dip or reflect deeper subsurface dip.

Most of the gently sloping and sloping ridges of Copiah County are covered by a mantle of Loess (Pleistocene) 2 to 7 feet thick. The steep hillsides or side slopes are mostly loamy or gravelly materials from the Citronelle Formation (fig. 12) and Pre-loess terrace deposits (Pleistocene). Scattered throughout the upland

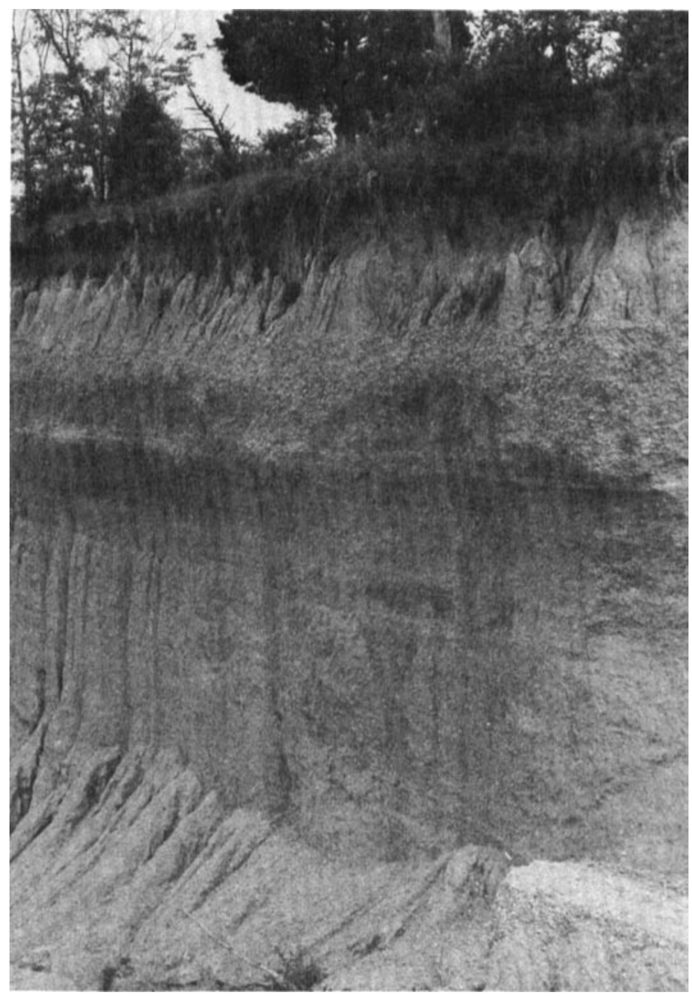


Figure 12.—Profile of Providence silt loam, 5 to 8 percent slopes, eroded, showing sandy and gravelly material of the Citronelle Formation.

section are areas of clays that are from the Hattiesburg and Catahoula Formations (Miocene), which underlie the Citronelle. In the valleys along major streams is recent alluvium. In the eastern section of the county, along the Pearl River is an area, from 1 to 3 miles in width, of nearly level to gently sloping flood plains and low terraces. This area consists mainly of silty and loamy soils that are a mixture of eolian and Coastal Plain material.

Parent materials from geological formations have influenced the texture, mineralogy, and inherent fertility of the soils.

Climate

Climate has had a direct influence in the development of the soils of Copiah County. Rainfall and temperature are active factors in soil formation. They influence the rates of weathering of parent materials and the decomposition of minerals. They also influence leaching, migration of fine particles, and illuviation. Climate also has indirect effects because it governs to a great extent the kinds of plants and animals that thrive on and in the soil.

The climate effects are uniform over Copiah County because the climate is the same over the entire area. The average rainfall is about 56 inches per year, and the average temperature is about 65°F. Organic matter decomposes at a rapid rate, and the high rainfall causes much leaching. This process makes soils acid.

Relief

Topography affects the drainage and rate of runoff. Thus, relief influences the moisture content in soils and the erosion on the surface. The rate of runoff is greater on steep slopes than on gentle or nearly level slopes. The amount of water that moves through the soil during development depends partly on relief. Excess water is present on and in soils that develop on low, flat topography. This extra water causes gray and mottled colors in the subsoil, and in places it causes an accumulation of organic matter in the surface layer. The influence of wetness is well expressed in many of the soils, such as Arkabutla, Gillsburg, and Guyton soils.

Fragipan formation also is associated with relief and drainage. A fragipan is compact and brittle and is most strongly expressed in nearly level to gently sloping, somewhat poorly drained to moderately well drained soils. Bude, Grenada, Lax, Loring, and Providence soils have a fragipan. The fragipan governs the depth that roots, air, and water can penetrate in the soils and the permeability and degree of wetness of the soils. In comparison with the other factors of soil formation, relief and drainage are more local in scope, and their influence on the soils can be observed on small farms. Slope is important; it limits land use as well as the productivity of the crops grown.

Living organisms

Plants and animals, especially the small ones (earthworms and insects) living in and on the soil have a direct influence on the nature of soils. Under natural conditions, plants govern the amount and distribution of organic matter in a soil profile.

Under forest conditions, organic matter is added to the soil as leaves and twigs decompose on the surface. The accumulation of organic matter under trees is usually confined to the A horizon. In native grassland, organic matter is derived from decomposition of the plants on the surface and from decomposition of the many fibrous roots. Most of the soils in Copiah County formed under forest conditions. Hardwoods (cherrybark oak, water oak, red oak, and hickory) under which Ariel, Gillsburg, Oaklimeter, and Memphis soils formed covered the forest sites of these soils. Loblolly and shortleaf pine, oak, and hickory provided the cover for the loamy hill sections of the county, which include Kolin, Lorman, Providence, Saffell, and Smithdale soils.

Time

Many thousands of years are required for most soils to form. The weathering of rocks and other materials precedes the development of soil horizons. The materials from which Lax, Lorman, Saffell, and Smithdale soils formed were deposited by the Gulf of Mexico millions of years ago. The silty mantle of loess was deposited from 18,000 to 25,000 years ago (*5*).

The soils of Copiah County have been forming and changing for long periods. The soils along the streams are not so old because material has been and is still being deposited on them. Ariel, Arkabutla, Bruno, Gillsburg, Guyton, Latonia, Oaklimeter, and Velda soils are on flood plains and are important for the production of row and forage crops.

Processes of soil formation

Because of the wide range of parent material, relief, age, and biological activity, the soil-forming processes of Copiah County are complex. The soils of the county have changed greatly since the geologic ages, thousands of years ago, when the parent materials were laid down. The soil-forming processes have produced the soils as we now know them and are still very active. The soils of the uplands are older and have stronger profile development than soils on the bottom lands.

The differences among the horizons of the soils in the county are caused by one or more processes. The main processes are the accumulation of organic matter, the leaching of carbonates and salts, the formation and translocation of silicate clay minerals, and the reduction and transfer of iron.

Organic matter has accumulated in the top layer of the soils in the county to form an A horizon. A large amount of this organic matter is well decomposed material, or humus, but a considerable amount of it consists of living plants and other organisms.

Carbonates and salts have been leached from most soils in the county. Most soils in the county are acid, and their colloidal complexes are predominantly saturated with hydrogen ions.

The formation and translocation of silicate clay minerals (eluviation) have affected most of the soils in the county. Because alluvial soils are young, the processes that cause the formation and translocation of silicate clay minerals have not been active long enough to cause significant differences among the layers. The A horizon of soils in the uplands is eluviated and contains a small amount of clay. The illuviated B horizon contains an accumulation of clay. The result of eluviation, or downward movement of clay, can be identified as clay films on faces of peds and on the walls of root channels and wormholes or other holes.

The reduction and transfer of iron have occurred in the poorly drained and somewhat poorly drained soils and to some extent in the lower part of the moderately well drained soils. This process is called gleying. It is more likely to occur in nearly level soils or in depressional soils than sloping soils. In the nearly level or depressional soils, the restricted drainage results in reduced leaching, pronounced hydration, anaerobic biological activity, accumulation of organic acids, reduction of iron, and development of gray colors. Well oxidized soils are generally red, yellow, and brown. When the soil is not sufficiently aerated and oxidized, gleying occurs, and mottles and concretions of iron and manganese form.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

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.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

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.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

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.

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.

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.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Favorable. Favorable soil features for the specific use.

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.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

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.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

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.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

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.

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.

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.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

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 filter (in tables). Because of rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

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.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

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.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

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.

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.

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 refill (in tables). The slow filling of ponds, resulting from restricted permeability in 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.

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.

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.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed 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."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

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.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded 1963-75 at Allen, Miss.]

Month	Temperature						Precipitation			
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more
	°F	°F	°F	°F	°F	Units	In	In	In	
January----	60.2	38.2	49.2	80	9	126	4.83	1.93	7.26	7
February---	62.1	36.7	49.4	79	15	84	4.69	2.85	6.33	6
March------	70.6	45.0	57.8	86	21	284	5.39	2.36	7.97	7
April------	78.6	54.2	66.4	89	32	492	6.11	1.97	9.50	5
May--------	83.6	59.6	71.6	93	42	670	5.40	2.81	7.66	7
June-------	89.9	65.6	77.8	98	50	834	3.69	1.55	5.49	5
July-------	91.5	68.6	80.0	99	57	930	4.42	2.87	5.82	8
August-----	91.0	67.5	79.3	98	55	908	4.24	3.45	4.99	7
September--	87.1	64.3	75.7	97	44	771	3.41	2.05	4.62	6
October----	80.0	52.2	66.1	94	32	499	3.48	.78	5.59	3
November---	69.5	44.6	57.1	86	21	241	4.04	1.44	6.19	6
December---	62.0	39.4	50.7	80	15	150	6.63	3.53	9.35	8
Yearly:										
Average--	77.2	53.0	65.1	---	---	---	---	---	---	---
Extreme--	---	---	---	101	9	---	---	---	---	---
Total----	---	---	---	---	---	5,989	56.33	46.93	64.46	75

[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 1963-75 at Allen, 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--	March 20	March 31	April 6
2 years in 10 later than--	March 12	March 25	April 2
5 years in 10 later than--	February 24	March 13	March 25
First freezing temperature in fall:			
1 year in 10 earlier than--	November 9	November 2	October 21
2 years in 10 earlier than--	November 17	November 7	October 26
5 years in 10 earlier than--	December 3	November 16	November 5

TABLE 3.--GROWING SEASON

[Recorded 1963-75 at Allen, Miss.]

Probability	Daily minimum temperature		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	246	228	207
8 years in 10	257	235	214
5 years in 10	279	249	226
2 years in 10	304	265	241
1 year in 10	328	280	255

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Ae	Ariel silt loam	22,458	4.5
Ar	Arkabutla silt loam	3,920	0.8
Br	Bruno sandy loam	7,372	1.5
BuA	Bude silt loam, 0 to 2 percent slopes	7,906	1.6
CaA	Cahaba sandy loam, 0 to 2 percent slopes	2,796	0.6
CaB	Cahaba sandy loam, 2 to 5 percent slopes	1,804	0.4
CoA	Calloway silt loam, 0 to 2 percent slopes	4,022	0.8
CuA	Columbus silt loam, 0 to 2 percent slopes	6,648	1.3
Gb	Gillsburg silt loam	43,717	8.7
GrA	Grenada silt loam, 0 to 2 percent slopes	687	0.1
Gu	Guyton silt loam	11,241	2.2
KoB2	Kolin silt loam, 2 to 5 percent slopes, eroded	12,489	2.5
KoC2	Kolin silt loam, 5 to 8 percent slopes, eroded	18,001	3.6
LaB	Latonia loamy sand, 0 to 5 percent slopes	3,209	0.6
LbB2	Lax silt loam, 2 to 5 percent slopes, eroded	932	0.2
LoA	Loring silt loam, 0 to 2 percent slopes	1,863	0.4
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded	32,038	6.4
LoC2	Loring silt loam, 5 to 8 percent slopes, eroded	16,140	3.2
LoD2	Loring silt loam, 8 to 12 percent slopes, eroded	5,069	1.0
LoD3	Loring silt loam, 5 to 12 percent slopes, severely eroded	3,558	0.7
LrD	Lorman fine sandy loam, 8 to 12 percent slopes	2,937	0.6
LrE	Lorman fine sandy loam, 12 to 35 percent slopes	13,594	2.7
LS	Lorman-Smithdale association, hilly	49,463	9.9
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded	1,853	0.4
MeC2	Memphis silt loam, 5 to 8 percent slopes, eroded	702	0.1
Ok	Oaklimeter silt loam	24,647	4.9
PrA	Providence silt loam, 0 to 2 percent slopes	2,434	0.5
PrB2	Providence silt loam, 2 to 5 percent slopes, eroded	69,393	13.9
PrC2	Providence silt loam, 5 to 8 percent slopes, eroded	15,859	3.2
PrC3	Providence silt loam, 5 to 12 percent slopes, severely eroded	641	0.1
SaE	Saffell gravelly sandy loam, 12 to 17 percent slopes	3,984	0.8
SaF	Saffell gravelly sandy loam, 17 to 40 percent slopes	12,656	2.5
SF	Saffell-Smithdale association, hilly	5,807	1.2
SmD	Smithdale sandy loam, 8 to 12 percent slopes	14,708	2.9
SmE	Smithdale sandy loam, 12 to 17 percent slopes	25,035	5.0
SmF	Smithdale sandy loam, 17 to 40 percent slopes	25,373	5.1
SmF3	Smithdale sandy loam, 17 to 40 percent slopes, severely eroded	765	0.2
ST	Smithdale-Lexington association hilly	21,134	4.2
Ud	Udorthents, gravelly	1,795	0.4
Ve	Velda very fine sandy loam	345	0.1
	Water	845	0.2
	Total	499,840	100.0

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 bermuda-grass	Improved bermuda-grass	Tall fescue	Bahiagrass
	Lb	Bu	Bu	AUM*	AUM*	AUM*	AUM*
Ae----------------------- Ariel	800	110	40	6.0	11.0	10.0	9.0
Ar----------------------- Arkabutla	---	70	20	6.0	10.0	9.0	9.0
Br----------------------- Bruno	---	---	---	4.0	5.0	---	4.5
BuA---------------------- Bude	625	85	25	6.5	9.0	8.0	8.5
CaA---------------------- Cahaba	800	90	35	6.0	10.0	7.0	8.5
CaB---------------------- Cahaba	750	85	30	6.0	9.5	7.0	8.0
CoA---------------------- Calloway	650	80	35	6.5	9.0	8.5	8.5
CuA---------------------- Columbus	---	80	30	6.5	10.0	7.0	8.5
Gb----------------------- Gillsburg	650	90	35	7.0	10.0	9.0	9.0
GrA---------------------- Grenada	600	80	35	6.0	9.5	8.0	8.0
Gu----------------------- Guyton	---	---	---	4.5	5.0	4.5	4.5
KoB2--------------------- Kolin	---	55	25	5.5	9.0	7.0	8.5
KoC2--------------------- Kolin	---	50	25	5.0	8.5	6.5	8.0
LaB---------------------- Latonia	---	60	25	6.0	9.5	7.0	8.5
LbB2--------------------- Lax	500	70	30	6.0	9.0	8.0	8.5
LoA---------------------- Loring	750	90	35	6.0	10.0	8.5	9.0
LoB2--------------------- Loring	700	90	30	6.0	10.0	8.0	8.5
LoC2--------------------- Loring	650	70	25	5.5	9.0	7.5	8.0
LoD2--------------------- Loring	500	60	20	5.0	8.5	7.0	8.0
LoD3--------------------- Loring	450	55	15	4.5	6.0	5.0	6.0
LrD---------------------- Lorman	---	---	---	3.0	6.0	4.5	4.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Cotton lint	Corn	Soybeans	Common bermuda-grass	Improved bermuda-grass	Tall fescue	Bahiagrass
	Lb	Bu	Bu	AUM*	AUM*	AUM*	AUM*
LrE Lorman	---	---	---	3.0	6.0	4.5	4.0
LS:**							
Lorman	---	---	---	---	---	---	---
Smithdale	---	---	---	---	---	---	---
MeB2 Memphis	750	90	35	7.5	10.0	8.5	9.0
MeC2 Memphis	700	80	30	7.0	9.0	7.5	8.0
Ok Oaklimeter	750	95	40	9.0	11.0	10.0	10.0
PrA Providence	700	80	35	6.0	10.0	8.5	9.0
PrB2 Providence	700	80	35	6.0	9.5	8.5	8.5
PrC2 Providence	650	70	30	5.0	9.0	7.5	8.0
PrC3 Providence	---	---	---	4.5	8.5	7.0	8.0
SaE Saffell	---	---	---	3.0	4.0	---	4.0
SaF Saffell	---	---	---	3.0	4.0	---	4.0
SF:**							
Saffell	---	---	---	3.0	4.0	---	4.0
Smithdale	---	---	---	3.0	4.0	---	4.0
SmD Smithdale	400	50	25	5.0	9.0	5.0	8.0
SmE Smithdale	---	---	---	4.5	9.0	5.0	8.0
SmF Smithdale	---	---	---	---	---	---	---
SmF3 Smithdale	---	---	---	---	---	---	---
ST:**							
Smithdale	---	---	---	---	---	---	---
Lexington	---	---	---	---	---	---	---
Ud. Udorthents							
Ve Velda	750	100	35	8.5	12.0	10.0	10.0

* 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	2,796	---	---	---	---
II	223,956	110,729	110,018	3,209	---
III	45,190	45,190	---	---	---
IV	53,293	49,373	3,920	---	---
V	18,613	---	18,613	---	---
VI	31,956	31,956	---	---	---
VII	121,451	121,451	---	---	---
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	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
Ae----------------- Ariel	1o7	Slight	Slight	Slight	Moderate	Cherrybark oak------ Eastern cottonwood-- Loblolly pine------- Sweetgum------------ Water oak----------- Yellow-poplar-------	110 115 95 100 105 110	Cherrybark oak, eastern cottonwood, loblolly pine, sweetgum, water oak, yellow-poplar.
Ar----------------- Arkabutla	1w8	Slight	Moderate	Moderate	Moderate	Cherrybark oak------ Eastern cottonwood-- Green ash----------- Loblolly pine------- Nuttall oak--------- Sweetgum------------ Water oak-----------	105 110 95 100 110 100 100	Cherrybark oak, eastern cottonwood, green ash, loblolly pine, sweetgum, American sycamore.
Br----------------- Bruno	2s5	Slight	Moderate	Moderate	Moderate	Cherrybark oak------ Water oak----------- Sweetgum------------ Willow oak---------- River birch--------- Sycamore------------ Eastern cottonwood--	116 105 110 88 --- --- ---	Cherrybark oak, Shumard oak, chestnut oak, willow oak, sweetgum, yellow-poplar, eastern cottonwood.
BuA---------------- Bude	1w8	Slight	Moderate	Slight	Moderate	Loblolly pine------- Cherrybark oak------ Sweetgum------------	98 90 90	Loblolly pine, cherrybark oak, sweetgum.
CaA, CaB----------- Cahaba	2o7	Slight	Slight	Slight	Moderate	Loblolly pine------- Slash pine---------- Yellow-poplar------- Sweetgum------------ Southern red oak---- White oak----------- Cherrybark oak------ Longleaf pine------- Blackgum------------	87 91 --- 90 --- --- --- 72 ---	Loblolly pine, yellow-poplar, sweetgum, American sycamore.
CoA---------------- Calloway	2w8	Slight	Moderate	Slight	Moderate	Cherrybark oak------ Loblolly pine------- Shortleaf pine------ Sweetgum------------ Water oak----------- Willow oak----------	90 90 80 90 90	Cherrybark oak, Shumard oak, sweetgum, water oak, yellow-poplar.
CuA---------------- Columbus	2w8	Slight	Moderate	Slight	Slight	Loblolly pine------- Sweetgum------------ Water oak----------- Yellow-poplar-------	90 85 90 90	Loblolly pine, sweetgum, yellow-poplar.
Gb----------------- Gillsburg	2w8	Slight	Moderate	Moderate	Moderate	Cherrybark oak------ Eastern cottonwood-- Green ash----------- Loblolly pine------- Sweetgum------------ American sycamore--- Water oak----------- Yellow-poplar-------	100 105 85 90 90 105 95 105	Eastern cottonwood, loblolly pine, sweetgum, American sycamore, yellow-poplar.
GrA---------------- Grenada	2o7	Slight	Slight	Slight	Slight	Cherrybark oak------ Water oak----------- Loblolly pine------- Slash pine---------- Southern red oak---- White oak-----------	85 80 95 95 --- ---	Cherrybark oak, loblolly pine, sweetgum, water oak.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Trees to plant
Gu----------------- Guyton	2w9	Slight	Severe	Moderate	Severe	Loblolly pine-------	90	Loblolly pine, sweetgum.
						Slash pine----------	90	
						Sweetgum------------	---	
						Green ash-----------	---	
						Southern red oak----	---	
						Water oak-----------	---	
KoB2, KoC2--------- Kolin	3w7	Slight	Moderate	Slight	Moderate	Loblolly pine-------	85	Loblolly pine.
						Longleaf pine-------	---	
						Slash pine----------	---	
						Sweetgum------------	---	
						Water oak-----------	---	
LaB---------------- Latonia	2o1	Slight	Slight	Slight	Slight	Loblolly pine-------	90	Loblolly pine.
						Slash pine----------	90	
						Shortleaf pine------	---	
LbB2--------------- Lax	2o7	Slight	Slight	Slight	Moderate	Yellow-poplar-------	90	Loblolly pine, shortleaf pine.
						Southern red oak----	70	
						Loblolly pine-------	80	
						Shortleaf pine------	70	
LoA, LoB2, LoC2, LoD2, LoD3-------- Loring	2o7	Slight	Slight	Slight	Severe	Cherrybark oak------	86	Loblolly pine, shortleaf pine, cherrybark oak, sweetgum, yellow-poplar.
						Loblolly pine-------	95	
						Shortleaf pine------	90	
						Sweetgum------------	90	
						Water oak-----------	90	
						Southern red oak----	---	
						Willow oak----------	---	
LrD, LrE----------- Lorman	3c2	Slight	Moderate	Moderate	Slight	Loblolly pine-------	80	Loblolly pine, shortleaf pine.
						Shortleaf pine------	70	
LS:*								
Lorman-------------	3c2	Slight	Moderate	Moderate	Slight	Loblolly pine-------	80	Loblolly pine, shortleaf pine.
						Shortleaf pine------	70	
Smithdale----------	2o1	Slight	Slight	Slight	Moderate	Loblolly pine-------	86	Loblolly pine.
						Longleaf pine-------	69	
						Slash pine----------	85	
						Shortleaf pine------	---	
MeB2, MeC2--------- Memphis	1o7	Slight	Slight	Slight	Moderate	Cherrybark oak------	100	Cherrybark oak, loblolly pine, sweetgum, yellow-poplar.
						Loblolly pine-------	105	
						Sweetgum------------	90	
						Water oak-----------	90	
Ok----------------- Oaklimeter	1o8	Slight	Slight	Slight	Moderate	Cherrybark oak------	100	Cherrybark oak, eastern cottonwood, loblolly pine, Nuttall oak, sweetgum, water oak, yellow-poplar.
						Eastern cottonwood--	100	
						Green ash-----------	90	
						Loblolly pine-------	90	
						Nuttall oak---------	100	
						Willow oak----------	100	
						Sweetgum------------	100	
						Water oak-----------	---	
						American sycamore---	---	
PrA, PrB2, PrC2, PrC3-------------- Providence	2o7	Slight	Slight	Slight	Slight	Loblolly pine-------	87	Loblolly pine, Shumard oak, sweetgum, yellow-poplar.
						Shortleaf pine------	70	
						Sweetgum------------	90	
						Cherrybark oak------	---	
						Southern red oak----	---	
SaE---------------- Saffell	4f2	Slight	Slight	Moderate	Slight	Loblolly pine-------	70	Loblolly pine, shortleaf pine, eastern redcedar.
						Shortleaf pine------	60	
						Eastern redcedar----	---	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
SaF----------------- Saffell	4f2	Moderate	Moderate	Moderate	Slight	Loblolly pine------- Shortleaf pine------ Eastern redcedar----	70 60 ---	Loblolly pine, shortleaf pine, eastern redcedar.
SF:* Saffell-----------	4f2	Moderate	Moderate	Moderate	Slight	Loblolly pine------- Shortleaf pine------ Eastern redcedar----	70 60 ---	Loblolly pine, shortleaf pine, eastern redcedar.
Smithdale---------	2o1	Slight	Slight	Slight	Moderate	Loblolly pine------- Longleaf pine------- Slash pine---------- Shortleaf pine------	86 69 85 ---	Loblolly pine.
SmD, SmE, SmF, SmF3--------------- Smithdale	2o1	Slight	Slight	Slight	Moderate	Loblolly pine------- Longleaf pine------- Slash pine---------- Shortleaf pine------	86 69 85	Loblolly pine.
ST:* Smithdale---------	2o1	Slight	Slight	Slight	Moderate	Loblolly pine------- Longleaf pine------- Slash pine---------- Shortleaf pine------	86 69 85	Loblolly pine.
Lexington---------	2o7	Slight	Slight	Slight	Moderate	Loblolly pine------- Sweetgum------------ Cherrybark oak------	80 89 80	Loblolly pine, yellow-poplar, cherrybark oak.
Ve----------------- Velda	1o7	Slight	Slight	Slight	Moderate	Loblolly pine------- Sweetgum------------ Water oak-----------	98 90 82	Cherrybark oak, loblolly pine, sweetgum, yellow-poplar.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION

[Only the soils suitable for production of commercial trees are listed]

Map symbol and soil name	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
Ae: Ariel	Favorable	---	Beaked panicum	26
	Normal	1,500	Pinehill bluestem	21
	Unfavorable	---	Switchcane	20
			Longleaf uniola	16
Ar: Arkabutla	Favorable	---	Pinehill bluestem	28
	Normal	1,500	Switchcane	26
	Unfavorable	---	Longleaf uniola	17
Br: Bruno	Favorable	---	Longleaf uniola	40
	Normal	1,600	Beaked panicum	25
	Unfavorable	---	Pinehill bluestem	15
BuA: Bude	Favorable	---	Pinehill bluestem	28
	Normal	1,500	Switchcane	22
	Unfavorable	---	Longleaf uniola	17
CaA, CaB: Cahaba	Favorable	---	Pinehill bluestem	40
	Normal	1,300	Longleaf uniola	30
	Unfavorable	---	Beaked panicum	10
CoA: Calloway	Favorable	---	Pinehill bluestem	20
	Normal	1,500	Switchcane	20
	Unfavorable	---	Little bluestem	15
			Longleaf uniola	15
CuA: Columbus	Favorable	---	Pinehill bluestem	21
	Normal	1,800	Beaked panicum	11
	Unfavorable	---	Longleaf uniola	12
			Carpetgrass	21
Gb: Gillsburg	Favorable	---	Switchcane	50
	Normal	1,600	Cutover muhly	13
	Unfavorable	---	Beaked panicum	10
GrA: Grenada	Favorable	---	Beaked panicum	30
	Normal	1,600	Longleaf uniola	15
	Unfavorable	---	Pinehill bluestem	10
			Little bluestem	10
			Switchcane	10
Gu: Guyton	Favorable	---	Pinehill bluestem	50
	Normal	1,600	Chalky bluestem	15
	Unfavorable	---	Silver plumegrass	15
KoB2, KoC2: Kolin	Favorable	---	Pinehill bluestem	50
	Normal	1,600	Switchgrass	10
	Unfavorable	---	Roundseed panicum	10
LaB: Latonia	Favorable	---	Pinehill bluestem	30
	Normal	1,000	Beaked panicum	20
	Unfavorable	---	Little bluestem	20
LbB2: Lax	Favorable	---	Beaked panicum	26
	Normal	1,600	Pinehill bluestem	21
	Unfavorable	---	Longleaf uniola	16
			Switchcane	16
LoA, LoB2, LoC2, LoD2, LoD3: Loring	Favorable	---	Beaked panicum	25
	Normal	1,600	Pinehill bluestem	20
	Unfavorable	---	Longleaf uniola	15
			Switchcane	15
LrD, LrE: Lorman	Favorable	---	Pinehill bluestem	32
	Normal	1,000	Longleaf uniola	32
	Unfavorable	---	Beaked panicum	15

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Map symbol and soil name	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
		Lb/acre		Pct
LS:*				
Lorman	Favorable	---	Pinehill bluestem	32
	Normal	1,000	Longleaf uniola	32
	Unfavorable	---	Beaked panicum	15
Smithdale	Favorable	---	Longleaf uniola	30
	Normal	1,200	Pinehill bluestem	17
	Unfavorable	---	Beaked panicum	12
			Panicum	12
MeB2, MeC2 Memphis	Favorable	---	Beaked panicum	25
	Normal	1,600	Longleaf uniola	15
	Unfavorable	---	Switchcane	15
			Little bluestem	10
			Pinehill bluestem	10
Ok Oaklimeter	Favorable	---	Beaked panicum	26
	Normal	1,500	Pinehill bluestem	21
	Unfavorable	---	Switchcane	20
			Longleaf uniola	16
PrA, PrB2, PrC2, PrC3 Providence	Favorable	---	Beaked panicum	26
	Normal	1,600	Pinehill bluestem	21
	Unfavorable	---	Longleaf uniola	16
			Switchcane	16
SaE, SaF Saffell	Favorable	---	Bluestem	20
	Normal	1,000	Uniola	15
	Unfavorable	---	Virginia wildrye	10
			Beaked panicum	10
			Indiangrass	5
			Panicum	5
			Sedge	5
SF:*				
Saffell	Favorable	---	Bluestem	20
	Normal	1,000	Uniola	15
	Unfavorable	---	Virginia wildrye	10
			Beaked panicum	10
			Indiangrass	5
			Panicum	5
			Sedge	5
Smithdale	Favorable	---	Longleaf uniola	30
	Normal	1,200	Pinehill bluestem	17
	Unfavorable	---	Beaked panicum	12
			Panicum	12
SmD, SmE, SmF, SmF3 Smithdale	Favorable	---	Longleaf uniola	30
	Normal	1,200	Pinehill bluestem	17
	Unfavorable	---	Beaked panicum	12
			Panicum	12
ST:*				
Smithdale	Favorable	---	Longleaf uniola	30
	Normal	1,200	Pinehill bluestem	17
	Unfavorable	---	Beaked panicum	12
			Panicum	12
Lexington	Favorable	---	Beaked panicum	30
	Normal	1,600	Pinehill bluestem	25
	Unfavorable	---	Longleaf uniola	18
			Switchcane	18
Ve Velda	Favorable	---	Beaked panicum	26
	Normal	1,600	Pinehill bluestem	21
	Unfavorable	---	Longleaf uniola	16

* 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
Ae: Ariel	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness, flooding, percs slowly.	Slight	Moderate: flooding.
Ar: Arkabutla	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.
Br: Bruno	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
BuA: Bude	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
CaA: Cahaba	Slight	Slight	Slight	Slight	Slight.
CaB: Cahaba	Slight	Slight	Moderate: slope.	Slight	Slight.
CoA: Calloway	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
CuA: Columbus	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Moderate: wetness.
Gb: Gillsburg	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
GrA: Grenada	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
Gu: Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
KoB2: Kolin	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight	Moderate: wetness.
KoC2: Kolin	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Moderate: wetness.
LaB: Latonia	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: droughty, flooding.
LbB2: Lax	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.
LoA: Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
LoB2: Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LoC2: Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Slight.
LoD2, LoD3: Loring	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
LrD: Lorman	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope.
LrE: Lorman	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
LS:*					
Lorman	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, erodes easily.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MeB2: Memphis	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
MeC2: Memphis	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
Ok: Oaklimeter	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
PrA: Providence	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Moderate: wetness.
PrB2: Providence	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Moderate: wetness.
PrC2: Providence	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Moderate: wetness.
PrC3: Providence	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
SaE: Saffell	Severe: slope.	Severe: slope.	Severe: slope.	Slight	Severe: slope.
SaF: Saffell	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SF:*					
Saffell	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	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
SmD, SmE: Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
SmF, SmF3: Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ST:*					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Lexington	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Ud.* Udorthents					
Ve: Velda	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.

* 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								Potential as habitat for--		
	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
Ae: Ariel	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
Ar: Arkabutla	Poor	Fair	Fair	Good	Good	---	Fair	Fair	Fair	Good	Fair.
Br: Bruno	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BuA: Bude	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair.
CaA, CaB: Cahaba	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CoA: Calloway	Fair	Good	Good	Good	---	---	Poor	Poor	Good	Good	Poor.
CuA: Columbus	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Gb: Gillsburg	Fair	Good	Good	Good	---	---	Fair	Fair	Good	Good	Fair.
GrA: Grenada	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
Gu: Guyton	Poor	Fair	Fair	Fair	---	---	Good	Good	Poor	Fair	Good.
KoB2, KoC2: Kolin	Good	Good	Good	---	Good	---	Poor	Very poor.	Good	Good	Very poor.
LaB: Latonia	Good	Good	Good	Good	Poor	---	Very poor.	Very poor.	Good	Good	Very poor.
LbB2: Lax	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LoA, LoB2: Loring	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LoC2, LoD2, LoD3: Loring	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LrD: Lorman	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
LrE: Lorman	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
LS:*											
Lorman	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
Smithdale	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
MeB2: Memphis	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MeC2: Memphis	Fair	Good	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 for--		
	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
Ok: Oaklimeter	Good	Good	Good	Good	Poor	---	Poor	Poor	Good	Good	Poor.
PrA, PrB2: Providence	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
PrC2, PrC3: Providence	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
SaE: Saffell	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
SaF: Saffell	Very poor.	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.
SF:*											
Saffell	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
Smithdale	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
SmD, SmE: Smithdale	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
SmF, SmF3: Smithdale	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
ST*:											
Smithdale	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
Lexington	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ud.* Udorthents											
Ve: Velda	Good	Good	Good	Good	Good	---	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
Ae-----------------Ariel	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
Ar-----------------Arkabutla	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.
Br-----------------Bruno	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
BuA----------------Bude	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.
CaA, CaB-----------Cahaba	Slight------------	Slight------------	Slight------------	Slight*------------	Slight.
CoA----------------Calloway	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.
CuA----------------Columbus	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, low strength.
Gb-----------------Gillsburg	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.
GrA----------------Grenada	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.
Gu-----------------Guyton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.
KoB2, KoC2---------Kolin	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
LaB----------------Latonia	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
LbB2---------------Lax	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.
LoA, LoB2----------Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.
LoC2---------------Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.
LoD2, LoD3---------Loring	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.
LrD----------------Lorman	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
LrE----------------Lorman	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.

See footnotes 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
LS:**					
Lorman	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MeB2 Memphis	Slight	Slight	Slight	Slight	Severe: low strength.
MeC2 Memphis	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.
Ok Oaklimeter	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
PrA, PrB2 Providence	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.
PrC2 Providence	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.
PrC3 Providence	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.
SaE, SaF Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SF:**					
Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SmD Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
SmE, SmF, SmF3 Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ST:**					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lexington	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Ud.** Udorthents					
Ve Velda	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.

* Where slopes are greater than 4 percent, rating is moderate.
** 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
Ae: Ariel	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Ar: Arkabutla	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
Br: Bruno	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
BuA: Bude	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
CaA, CaB: Cahaba	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer.
CoA: Calloway	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
CuA: Columbus	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness, thin layer.
Gb: Gillsburg	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
GrA: Grenada	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Gu: Guyton	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
KoB2, KoC2: Kolin	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
LaB: Latonia	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
LbB2: Lax	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness.	Moderate: wetness.	Fair: small stones, wetness.
LoA, LoB2, LoC2: Loring	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
LoD2, LoD3: Loring	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: slope, wetness.

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
LrD----------------- Lorman	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
LrE----------------- Lorman	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
LS:*					
Lorman--------------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Smithdale-----------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
MeB2, MeC2---------- Memphis	Slight------------	Moderate: seepage, slope.	Slight------------	Slight------------	Good.
Ok------------------ Oaklimeter	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
PrA----------------- Providence	Severe: wetness, percs slowly.	Slight------------	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
PrB2, PrC2---------- Providence	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
PrC3---------------- Providence	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
SaE, SaF------------ Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
SF:*					
Saffell-------------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
Smithdale-----------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
SmD----------------- Smithdale	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
SmE, SmF, SmF3------ 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
ST:*					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Lexington	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Ud.* Udorthents					
Ve Velda	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.

* 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
Ae: Ariel	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ar: Arkabutla	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Br: Bruno	Good	Probable	Improbable: too sandy.	Poor: thin layer.
BuA: Bude	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
CaA, CaB: Cahaba	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
CoA: Calloway	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
CuA: Columbus	Fair: wetness.	Probable	Improbable: too sandy.	Fair: small stones.
Gb: Gillsburg	Fair: low strength, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
GrA: Grenada	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Gu: Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
KoB2, KoC2: Kolin	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
LaB: Latonia	Good	Probable	Improbable: too sandy.	Fair: too sandy, small stones, thin layer.
LbB2: Lax	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
LoA, LoB2, LoC2: Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
LoD2, LoD3: Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
LrD: Lorman	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
LrE: Lorman	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
LS:*				
Lorman	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
MeB2, MeC2 Memphis	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ok Oaklimeter	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
PrA, PrB2, PrC2 Providence	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
PrC3 Providence	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
SaE Saffell	Good	Improbable: excess fines.	Probable	Poor: small stones, area reclaim.
SaF Saffell	Poor: slope.	Improbable: excess fines.	Probable	Poor: small stones, area reclaim, slope.
SF:*				
Saffell	Fair: slope.	Improbable: excess fines.	Probable	Poor: small stones, area reclaim, slope.
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
SmD, SmE Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
SmF, SmF3 Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
ST:*				
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Lexington	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Ud*. Udorthents				
Ve Velda	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

* 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--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Ae: Ariel	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Flooding	Erodes easily, wetness.	Erodes easily.
Ar: Arkabutla	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding	Erodes easily, wetness.	Erodes easily.
Br: Bruno	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Too sandy	Droughty.
BuA: Bude	Slight	Severe: wetness.	Severe: no water.	Percs slowly	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
CaA, CaB: Cahaba	Severe: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Favorable	Favorable.
CoA: Calloway	Moderate: seepage.	Severe: thin layer.	Severe: no water.	Percs slowly	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
CuA: Columbus	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: cutbanks cave.	Favorable	Wetness	Erodes easily.
Gb: Gillsburg	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Flooding	Erodes easily, wetness.	Wetness, erodes easily.
GrA: Grenada	Moderate: seepage.	Severe: piping.	Severe: no water.	Percs slowly	Erodes easily, wetness, percs slowly.	Erodes easily, rooting depth, percs slowly.
Gu: Guyton	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
KoB2, KoC2: Kolin	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
LaB: Latonia	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy	Droughty.
LbB2: Lax	Moderate: seepage.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
LoA: Loring	Moderate: seepage.	Moderate: piping.	Severe: no water.	Favorable	Erodes easily, wetness.	Erodes easily, rooting depth.
LoB2, LoC2: Loring	Moderate: seepage.	Moderate: piping.	Severe: no water.	Slope	Erodes easily, wetness.	Erodes easily, rooting depth.
LoD2, LoD3: Loring	Moderate: seepage.	Moderate: piping.	Severe: no water.	Slope	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
LrD: Lorman	Slight	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.

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
LrE: Lorman	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
LS:*						
Lorman	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
MeB2, MeC2: Memphis	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
Ok: Oaklimeter	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding	Erodes easily, wetness.	Erodes easily.
PrA: Providence	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: no water.	Favorable	Erodes easily, wetness.	Erodes easily, rooting depth.
PrB2, PrC2: Providence	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: no water.	Slope	Erodes easily, wetness.	Erodes easily, rooting depth.
PrC3: Providence	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: no water.	Slope	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
SaE: Saffell	Severe: seepage.	Slight	Severe: no water.	Deep to water	Slope	Slope, droughty.
SaF: Saffell	Severe: slope, seepage.	Slight	Severe: no water.	Deep to water	Slope	Slope, droughty.
SF:*						
Saffell	Severe: slope, seepage.	Slight	Severe: no water.	Deep to water	Slope	Slope, droughty.
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
SmD, SmE: Smithdale	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
SmF, SmF3: Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
ST:*						
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
Lexington	Severe: seepage.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
Ud.* Udorthents						
Ve: Velda	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ae--------------- Ariel	0-42	Silt loam--------	ML, CL-ML	A-4	0	100	100	90-100	85-95	<30	NP-7
	42-64	Silt loam, loam	ML, CL, CL-ML	A-4	0	100	100	85-100	70-90	<30	NP-10
Ar--------------- Arkabutla	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	85-100	60-95	25-35	7-15
	5-70	Silty clay loam, loam, silt loam.	CL	A-6, A-7	0	100	100	85-100	70-90	30-45	12-25
Br--------------- Bruno	0-7	Sandy loam-------	SM, ML	A-2, A-4	0	100	100	60-85	30-60	<25	NP-3
	7-50	Sand, loamy sand	SP-SM, SM	A-2	0	100	100	60-80	10-30	---	NP
	50-70	Sand-------------	SP-SM, SM	A-2, A-3	0	100	100	50-70	5-20	---	NP
BuA-------------- Bude	0-18	Silt loam--------	CL	A-6	0	100	100	95-100	85-96	25-40	11-25
	18-36	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	84-98	35-50	15-30
	36-64	Silt loam, clay loam, silty clay loam.	CL, CH	A-7, A-6	0	100	100	95-100	75-90	35-65	15-40
CaA, CaB--------- Cahaba	0-6	Sandy loam-------	SM	A-4, A-2	0	95-100	95-100	65-90	30-45	---	NP
	6-46	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6	0	90-100	80-100	75-90	40-75	22-35	8-15
	46-80	Sand, loamy sand, fine sandy loam.	SM, SP-SM	A-2-4	0	95-100	90-100	60-85	10-35	---	NP
CoA-------------- Calloway	0-25	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	25-35	5-15
	25-64	Silt loam, silty clay loam.	CL	A-6	0	100	100	100	90-95	30-40	12-20
CuA-------------- Columbus	0-6	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-100	70-90	<30	3-10
	6-42	Clay loam, loam, sandy clay loam.	CL, SC	A-4, A-6	0	100	90-100	80-95	40-80	22-35	8-15
	42-75	Fine sandy loam, loamy sand, sand.	SM, SP-SM	A-2, A-4	0	100	90-100	50-85	10-45	<20	NP-4
Gb--------------- Gillsburg	0-26	Silt loam--------	CL-ML, CL	A-4	0	100	100	100	95-100	20-28	5-10
	26-64	Silt loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	20-38	5-16
GrA-------------- Grenada	0-7	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	90-100	<30	NP-6
	7-22	Silt loam, silty clay loam.	CL	A-6, A-4	0	100	100	95-100	90-100	27-40	8-19
	22-27	Silt loam--------	CL-ML, CL	A-4	0	100	100	95-100	90-100	20-30	5-10
	27-64	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
Gu--------------- Guyton	0-29	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	65-90	<27	NP-7
	29-58	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	0	100	100	94-100	75-95	22-40	6-18
	58-77	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	51-95	<40	NP-18
KoB2, KoC2------- Kolin	0-7	Silt loam--------	ML, CL-ML	A-4	0	100	100	85-100	60-85	<27	NP-7
	7-34	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	85-97	30-46	11-22
	34-75	Clay, silty clay	CH	A-7	0	100	100	90-100	75-95	50-63	25-35
LaB-------------- Latonia	0-8	Loamy sand-------	SM	A-2	0	90-100	85-100	50-80	15-35	---	NP
	8-45	Sandy loam, loam, fine sandy loam.	SM	A-2, A-4	0	90-100	85-100	60-85	30-50	---	NP
	45-80	Sand, loamy sand	SM, SP-SM	A-2	0	90-100	85-100	50-75	10-30	---	NP

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	
LbB2-------------- Lax	0-7	Silt loam--------	ML, CL-ML, CL	A-4	0	80-100	75-100	70-95	55-85	15-30	3-10
	7-25	Silt loam, silty clay loam.	CL, ML	A-4, A-6	0	80-100	75-100	70-95	60-95	25-40	8-16
	25-34	Gravelly silt loam, gravelly silty clay loam, silt loam.	CL, GC, SC	A-6, A-2, A-4	0-5	55-100	50-100	45-95	30-95	25-40	8-18
	34-64	Gravelly silty clay loam, very gravelly silt loam, cherty clay loam.	GC	A-2	0-20	30-50	25-50	20-45	15-30	25-40	8-18
LoA, LoB2, LoC2, LoD2, LoD3------ Loring	0-7	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	7-23	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	8-20
	23-68	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	8-22
LrD, LrE--------- Lorman	0-8	Fine sandy loam--	SM, SM-SC, ML, CL-ML	A-4	0	100	100	65-90	40-55	<20	NP-7
	8-43	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	95-100	95-100	90-97	44-85	20-50
	43-80	Clay, silty clay, silty clay loam.	CL, CH	A-6, A-7	0	90-100	80-100	80-100	75-97	30-63	12-39
LS:* Lorman----------	0-8	Fine sandy loam--	SM, SM-SC, ML, CL-ML	A-4	0	100	100	65-90	40-55	<20	NP-7
	8-43	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	95-100	95-100	90-97	44-85	20-50
	43-80	Clay, silty clay, silty clay loam.	CL, CH	A-6, A-7	0	90-100	80-100	80-100	75-97	30-63	12-39
Smithdale-------	0-17	Sandy loam-------	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	17-40	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
	40-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
MeB2, MeC2------- Memphis	0-6	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	6-34	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	34-80	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
Ok--------------- Oaklimeter	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	90-100	70-90	<30	NP-8
	7-27	Very fine sandy loam, silt loam, loam.	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	<30	NP-8
	27-64	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4	0	100	100	90-100	90-100	<30	NP-10

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
PrA, PrB2, PrC2, PrC3: Providence	0-6	Silt loam	ML, CL, CL-ML	A-4	0	100	100	100	85-100	<30	NP-10
	6-25	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	30-45	11-20
	25-46	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-90	25-40	11-20
	46-70	Loam, clay loam, sandy clay loam.	CL, SC	A-6, A-4	0	100	95-100	70-95	40-80	20-35	8-18
SaE, SaF: Saffell	0-16	Gravelly sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	16-35	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
	35-78	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
SF:* Saffell	0-16	Gravelly sandy loam.	SM	A-1, A-2 A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	16-35	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
	35-78	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
Smithdale	0-17	Sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	17-40	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
	40-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
SmD, SmE, SmF, SmF3: Smithdale	0-17	Sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	17-40	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
	40-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
ST:* Smithdale	0-17	Sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	17-40	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
	40-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
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
	6-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	75-95	27-45	11-25
	31-80	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
Ud.* Udorthents											

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	
Ve----------------- Velda	0-55	Very fine sandy loam.	ML, CL-ML	A-4	0	100	100	90-100	60-90	<25	NP-7
	55-74	Silt loam, fine sandy loam, loamy very fine sand.	ML, SM, CL-ML, SM-SC	A-4	0	100	100	70-95	45-90	<25	NP-7

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
Ae----------------	0-42	12-18	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low------------	0.43	5	.5-2
Ariel	42-64	7-27	1.40-1.50	0.2-0.6	0.16-0.20	4.5-5.5	Low------------	0.43		
Ar----------------	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
Arkabutla	5-70	20-35	1.45-1.55	0.6-2.0	0.18-0.21	4.5-5.5	Low------------	0.32		
Br----------------	0-7	3-10	1.20-1.40	6.0-20	0.10-0.15	5.1-7.8	Low------------	0.17	5	.5-2
Bruno	7-50	2-8	1.20-1.40	6.0-20	0.05-0.10	5.1-7.8	Low------------	0.17		
	50-70	2-8	1.20-1.30	6.0-20	0.02-0.05	5.1-7.8	Very low------	0.17		
BuA---------------	0-18	5-30	1.40-1.55	0.6-2.0	0.18-0.23	4.5-6.0	Low------------	0.49	3	.5-2
Bude	18-36	18-30	1.35-1.55	0.06-0.2	0.10-0.12	4.5-6.0	Moderate------	0.43		
	36-64	15-35	1.35-1.55	0.06-0.2	0.10-0.12	4.5-6.0	Moderate------	0.37		
CaA, CaB----------	0-6	7-17	1.45-1.70	2.0-6.0	0.10-0.14	4.5-6.0	Low------------	0.24	5	.5-2
Cahaba	6-46	18-35	1.40-1.60	0.6-2.0	0.12-0.15	4.5-6.0	Low------------	0.28		
	46-80	4-20	1.40-1.65	2.0-20	0.05-0.10	4.5-6.0	Low------------	0.24		
CoA---------------	0-25	10-30	1.40-1.55	0.6-2.0	0.20-0.23	4.5-6.0	Low------------	0.49	3	.5-2
Calloway	25-64	10-32	1.35-1.55	0.06-0.2	0.09-0.12	4.5-6.0	Moderate------	0.43		
CuA---------------	0-6	10-16	1.50-1.55	0.6-2.0	0.20-0.22	4.5-5.5	Low------------	0.37	4	2-3
Columbus	6-42	18-33	1.55-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Low------------	0.20		
	42-75	6-12	1.35-1.40	6.0-20	0.05-0.10	4.5-5.5	Low------------	0.17		
Gb----------------	0-26	6-18	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low------------	0.43	5	1-3
Gillsburg	26-64	10-18	1.40-1.55	0.2-0.6	0.16-0.18	4.5-5.5	Low------------	0.43		
GrA---------------	0-7	12-16	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low------------	0.43	3	.5-2
Grenada	7-22	18-30	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low------------	0.43		
	22-27	12-16	1.35-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low------------	0.43		
	27-64	15-32	1.45-1.60	0.06-0.2	0.10-0.12	4.5-6.0	Low------------	0.37		
Gu----------------	0-29	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low------------	0.43	5	<2
Guyton	29-58	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low------------	0.37		
	58-77	20-35	1.35-1.70	0.06-2.0	0.15-0.22	3.6-8.4	Low------------	0.37		
KoB2, KoC2--------	0-7	10-27	1.35-1.65	0.6-2.0	0.18-0.22	5.1-6.5	Low------------	0.43	5	.5-2
Kolin	7-34	20-35	1.35-1.65	0.2-0.6	0.18-0.22	4.5-6.0	Moderate------	0.37		
	34-75	40-55	1.20-1.65	<0.06	0.15-0.18	4.5-6.5	High----------	0.32		
LaB---------------	0-8	3-12	1.40-1.50	6.0-20	0.05-0.10	4.5-5.5	Very low------	0.17	4	.5-2
Latonia	8-45	10-16	1.40-1.50	2.0-6.0	0.10-0.15	4.5-5.5	Low------------	0.20		
	45-80	3-10	1.40-1.50	6.0-20	0.05-0.10	4.5-5.5	Very low------	0.17		
LbB2--------------	0-7	8-25	1.30-1.45	0.6-2.0	0.18-0.22	4.5-6.5	Low------------	0.43	3	.5-2
Lax	7-25	18-35	1.30-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low------------	0.43		
	25-34	18-35	1.50-1.70	0.06-0.2	0.06-0.10	4.5-5.5	Low------------	0.43		
	34-64	18-35	1.50-1.75	0.06-0.2	0.06-0.10	4.5-5.5	Low------------	0.37		
LoA, LoB2, LoC2,										
LoD2, LoD3-------	0-7	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low------------	0.49	3	.5-2
Loring	7-23	18-35	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low------------	0.43		
	23-68	12-25	1.50-1.70	0.06-0.2	0.06-0.13	4.5-6.0	Low------------	0.43		
LrD, LrE----------	0-8	5-20	1.30-1.65	0.6-2.0	0.10-0.15	4.5-6.5	Low------------	0.37	3	.5-1
Lorman	8-43	35-55	1.20-1.50	<0.06	0.16-0.20	5.1-7.8	Very high-----	0.32		
	43-80	35-55	1.20-1.65	<0.06	0.10-0.16	5.6-7.8	High----------	0.32		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
LS:*										
Lorman----------	0-8	5-20	1.30-1.65	0.6-2.0	0.10-0.15	4.5-6.5	Low----------	0.37	3	.5-1
	8-43	35-55	1.20-1.50	<0.06	0.16-0.20	5.1-7.8	Very high----	0.32		
	43-80	35-55	1.20-1.65	<0.06	0.10-0.16	5.6-7.8	High---------	0.32		
Smithdale-------	0-17	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	17-40	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	40-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
MeB2, MeC2------- Memphis	0-6	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low----------	0.37	5	1-2
	6-34	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.37		
	34-80	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low----------	0.37		
Ok--------------- 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
	7-27	7-18	1.40-1.50	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.43		
	27-64	7-30	1.40-1.50	0.6-2.0	0.20-0.20	4.5-5.5	Low----------	0.43		
PrA, PrB2, PrC2, PrC3------------ Providence	0-6	5-12	1.30-1.40	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.49	3	.5-3
	6-25	18-30	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	25-46	20-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Moderate-----	0.32		
	46-70	12-25	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low----------	0.32		
SaE, SaF--------- Saffell	0-16	5-20	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.20	4	1-2
	16-35	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
	35-78	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.17		
SF:*										
Saffell---------	0-16	5-20	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.20	4	1-2
	16-35	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
	35-78	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.17		
Smithdale-------	0-17	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	17-40	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	40-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
SmD, SmE, SmF, SmF3------------ Smithdale	0-17	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	17-40	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	40-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
ST:*										
Smithdale-------	0-17	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	17-40	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	40-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
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
	6-31	20-33	1.40-1.55	0.6-2.0	0.16-0.21	4.5-6.0	Low----------	0.43		
	31-80	15-29	1.30-1.50	2.0-6.0	0.06-0.12	4.5-6.0	Low----------	0.24		
Ud.* Udorthents										
Ve--------------- Velda	0-55	8-18	1.40-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.43	5	.5-2
	55-74	10-18	1.40-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.43		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "brief," "apparent," and "perched" are explained in the text. Absence of an entry indicates that the feature is not a concern]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
Ae----------------- Ariel	C	Occasional	Brief-----	Jan-Apr	2.0-3.0	Apparent	Jan-Apr	Low------	Moderate.
Ar----------------- Arkabutla	C	Frequent----	Brief to very long.	Jan-Apr	1.5-2.5	Apparent	Jan-Apr	High-----	High.
Br----------------- Bruno	A	Frequent----	Brief-----	Dec-Jun	4.0-6.0	Apparent	Dec-Apr	Low------	Low.
BuA---------------- Bude	C	None--------	---	---	0.5-1.5	Perched	Jan-Apr	High-----	High.
CaA, CaB----------- Cahaba	B	None--------	---	---	>6.0	---	---	Moderate	Moderate.
CoA---------------- Calloway	C	None--------	---	---	1.0-2.0	Perched	Jan-Apr	High-----	Moderate.
CuA---------------- Columbus	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	High-----	High.
Gb----------------- Gillsburg	C	Occasional	Brief-----	Jan-Mar	1.0-1.5	Apparent	Jan-Apr	High-----	High.
GrA---------------- Grenada	C	None--------	---	---	1.5-2.5	Perched	Jan-Apr	Moderate	Moderate.
Gu----------------- Guyton	D	Frequent----	Very brief to long.	Jan-Dec	0-1.5	Perched	Dec-May	High-----	Moderate.
KoB2, KoC2--------- Kolin	C	None--------	---	---	1.5-3.0	Perched	Dec-Apr	High-----	Moderate.
LaB---------------- Latonia	B	Occasional	Very brief	Nov-Apr	>6.0	---	---	Low------	Moderate.
LbB2--------------- Lax	C	None--------	---	---	1.5-2.5	Perched	Dec-Mar	High-----	Moderate.
LoA, LoB2, LoC2, LoD2, LoD3------- Loring	C	None--------	---	---	2.0-3.0	Perched	Dec-Mar	Moderate	Moderate.
LrD, LrE----------- Lorman	D	None--------	---	---	>6.0	---	---	High-----	Moderate.
LS:*									
Lorman------------	D	None--------	---	---	>6.0	---	---	High-----	Moderate.
Smithdale---------	B	None--------	---	---	>6.0	---	---	Low------	Moderate.
MeB2, MeC2--------- Memphis	B	None--------	---	---	>6.0	---	---	Moderate	Moderate.
Ok----------------- Oaklimeter	C	Occasional	Brief-----	Nov-Apr	1.5-2.5	Apparent	Nov-Mar	Moderate	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
PrA, PrB2, PrC2, PrC3: Providence	C	None	---	---	1.5-3.0	Perched	Jan-Mar	Moderate	Moderate.
SaE, SaF: Saffell	B	None	---	---	>6.0	---	---	Low	Moderate.
SF:*									
Saffell	B	None	---	---	>6.0	---	---	Low	Moderate.
Smithdale	B	None	---	---	>6.0	---	---	Low	Moderate.
SmD, SmE, SmF, SmF3: Smithdale	B	None	---	---	>6.0	---	---	Low	Moderate.
ST:*									
Smithdale	B	None	---	---	>6.0	---	---	Low	Moderate.
Lexington	B	None	---	---	>6.0	---	---	Moderate	Moderate.
Ud.* Udorthents									
Ve: Velda	B	Occasional	Brief	Jan-Mar	>6.0	---	---	Low	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--PHYSICAL ANALYSES OF SELECTED SOILS

Soil series	Horizon	Depth	Particle-size distribution							
			Very coarse sand (2.0-1.0 mm)	Coarse sand (1.0-0.5 mm)	Medium sand (0.5-0.25 mm)	Fine sand (0.25-0.10 mm)	Very fine sand (0.10-0.05 mm)	Total sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
		In	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct
Bude	Ap	0-5	1.6	0.4	1.9	4.1	5.2	13.2	79.2	7.6
	B2	5-18	0.6	1.9	0.4	0.4	1.5	4.8	79.3	15.9
	Bx'&A'2	18-23	0.4	1.5	1.3	1.0	1.3	5.5	77.9	16.6
	B'x2	23-36	0.7	1.4	1.3	1.1	1.6	6.1	70.1	23.8
	IIB'x3	36-64	0.9	3.3	8.3	12.8	5.1	30.4	56.6	13.0
Guyton*	A1	0-6	0.5	0.7	1.0	2.1	4.8	9.1	70.2	20.7
	A21g	6-24	0.6	1.2	2.1	4.5	7.2	15.6	66.0	18.4
	A22g	24-33	0.4	0.4	0.8	4.9	6.2	12.7	71.8	15.5
	B21tg	33-64	0.7	2.5	2.9	6.1	5.1	17.3	64.5	18.2
	B22tg	64-70	0.8	1.1	1.4	7.0	9.2	19.5	64.3	16.2
Kolin**	Ap	0-7	1.1	1.3	1.8	1.8	1.7	7.7	76.6	15.7
	B21t	7-14	0.1	0.3	1.0	1.1	1.5	4.0	72.6	23.4
	B22t	14-26	0.5	1.3	1.1	1.2	1.3	5.4	69.2	25.4
	B&A'2	26-34	1.4	0.4	0.7	1.4	2.9	6.8	75.7	17.5
	IIB24t	34-67	0.1	0.3	1.2	3.7	10.7	16.0	44.9	39.1
	IIC	67-75	0.1	0.1	0.1	0.5	5.3	6.1	47.7	46.2
Lorman	A1	0-8	0.7	1.0	2.4	33.9	17.9	55.9	37.3	6.8
	B21t	8-28	0.1	0.1	0.2	3.4	12.0	15.8	30.7	53.5
	B22t	28-43	0.1	0.1	0.1	1.3	6.5	8.1	38.8	53.1
	C	43-70	0.1	0.1	0.1	3.6	8.1	12.0	35.8	52.2

* Not the same pedon described as typical for the Guyton series.

** The 39.1 percent clay in the IIB24t horizon is 0.9 percent less clay than the allowable range for the series. This is within the range of sampling error, and therefore, the soil is not considered to be a taxadjunct to the series.

TABLE 19.--ENGINEERING INDEX TEST DATA

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution: Percentage passing sieve--				Grain-size distribution: 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	Ratio
										Pct		Lb/ft^3	Pct	Pct	Pct
Kolin silt loam:[1] (S79-MS-15-3)															
B22t----------14 to 26	A-6(16)	CL	100	100	98	95	64	30	21	40	15	103.9	19.0	20	1.64
B&A'2---------26 to 34	A-7(24)	CL	100	100	99	97	64	31	23	46	22	103.0	19.6	22	1.58
IIB24t--------34 to 67	A-7(29)	CL	100	100	99	93	57	33	28	48	30	107.4	17.2	13	1.86
Lorman fine sandy loam:[2] (S79-MS-15-4)															
B21t---------- 8 to 28	A-7(50)	CH	100	100	100	94	74	59	51	71	47	96.0	22.0	11	1.95
B22t----------28 to 43	A-7(56)	CH	100	100	100	97	75	66	47	73	50	101.7	21.1	11	1.93
C-------------43 to 80	A-7(44)	CH	100	100	100	97	83	65	50	63	39	97.8	22.5	9	2.02

[1] Kolin silt loam:
2 miles south of Hazlehurst on U.S. Highway 51 and 300 feet east of road, in pasture.

[2] Lorman fine sandy loam:
1 mile south of Hazlehurst on paved road to Interstate 55 and about 1/4 mile west of road, in pine forest.

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Ariel	Coarse-silty, mixed, thermic Fluventic Dystrochrepts
Arkabutla	Fine-silty, mixed, acid, thermic Aeric Fluvaquents
Bruno	Sandy, mixed, thermic Typic Udifluvents
*Bude	Fine-silty, mixed, thermic Glossaquic Fragiudalfs
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
Calloway	Fine-silty, mixed, thermic Glossaquic Fragiudalfs
Columbus	Fine-loamy, siliceous, thermic Aquic Hapludults
Gillsburg	Coarse-silty, mixed, acid, thermic Aeric Fluvaquents
Grenada	Fine-silty, mixed, thermic Glossic Fragiudalfs
Guyton	Fine-silty, siliceous, thermic Typic Glossaqualfs
Kolin	Fine-silty, siliceous, thermic Glossaquic Paleudalfs
Latonia	Coarse-loamy, siliceous, thermic Typic Hapludults
Lax	Fine-silty, siliceous, thermic Typic Fragiudults
Lexington	Fine-silty, mixed, thermic Typic Paleudalfs
Loring	Fine-silty, mixed, thermic Typic Fragiudalfs
Lorman	Fine, montmorillonitic, thermic Vertic Hapludalfs
Memphis	Fine-silty, mixed, thermic Typic Hapludalfs
Oaklimeter	Coarse-silty, mixed, thermic Fluvaquentic Dystrochrepts
Providence	Fine-silty, mixed, thermic Typic Fragiudalfs
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
Smithdale	Fine-loamy, siliceous, thermic Typic Paleudults
Udorthents	Loamy-skeletal, siliceous, thermic Typic Udorthents
Velda	Coarse-silty, siliceous, thermic Fluventic Dystrochrepts

* Taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

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