United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Louisiana Agricultural
Experiment Station and
Louisiana Soil and Water
Conservation Committee

Soil Survey of Jefferson Davis Parish, Louisiana

How to Use This Soil Survey

General Soil Map

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

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

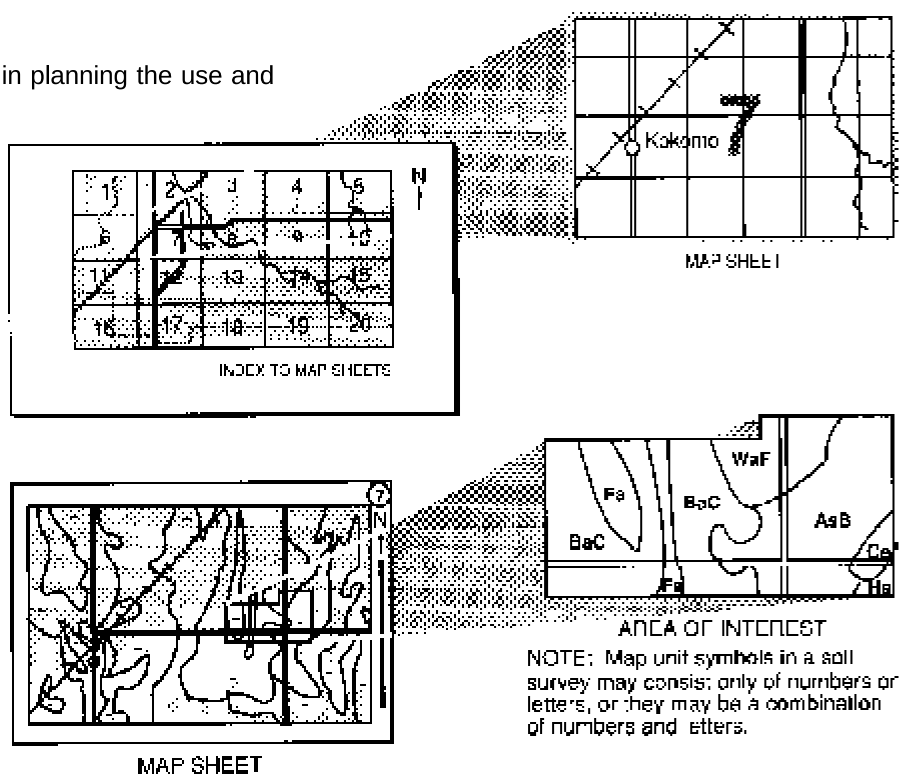
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

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

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

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



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1989. Soil names and descriptions were approved in 1989. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1989. This survey was made cooperatively by the Natural Resources Conservation Service, the Louisiana Agricultural Experiment Station, and the Louisiana Soil and Water Conservation Committee. The survey is part of the technical assistance furnished to the Gulf Coast Soil and Water Conservation District.

Cover: Rice, which is a major crop in Jefferson Davis Parish, is being harvested in an area of Crowley-Vidrine silt loam, 0 to 1 percent slopes.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

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Summary of Tables

Foreword

This soil survey contains information that can be used in land-planning programs in Jefferson Davis Parish. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, 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 suitability of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations that affect various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. 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 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 Natural Resources Conservation Service or the Cooperative Extension Service.

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Soil Survey of
Jefferson Davis Parish, Louisiana

By Clay T. Midkiff, Natural Resources Conservation Service

Fieldwork by Clay T. Midkiff, Natural Resources Conservation Service, and Rick Nolde, Louisiana Soil and Water Conservation Committee

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

JEFFERSON DAVIS PARISH is in southwestern Louisiana, about 100 miles west of Baton Rouge (fig.1). The total area is 421,600 acres, or 659 square miles. In 1990 the population of the parish was about 30,722, according to the Bureau of the Census. About 42 percent of the population lives in rural areas, and the rest lives in urban areas.

Land use is primarily agricultural. About 60 percent of the land is used as cultivated cropland, 12 percent as woodland, and 10 percent as pasture or range. The other 18 percent is used as urban land, swampland, marshland, or idle land.

The parish consists generally of three Major Land Resource Areas. They are the Gulf Coast Prairies in areas scattered throughout the parish; the Western Gulf Coast Flatwoods in the northwestern corner of the parish; and the Gulf Coast Marsh in the southern part of the parish. Flood plains, which include the hardwood bottom land and swamps, are along the major streams throughout the parish.

The Gulf Coast Prairies make up about 86 percent of the parish. The soils range from loamy to clayey. They are generally medium in natural fertility, but most crops respond well to applications of fertilizer and lime. Most areas of these soils are used for cultivated crops. Some areas are used for urban development or as pasture. Wetness is the main limitation for most uses.

The Western Gulf Coast Flatwoods make up about 8 percent of the parish. The soils are mainly loamy. They are generally low in natural fertility, but crops respond well to applications of fertilizer and lime. Most areas of these soils are used as woodland or cropland. Some areas are used as pasture or homesites. Wetness is the main limitation for most uses. Erosion is a hazard on sloping soils.

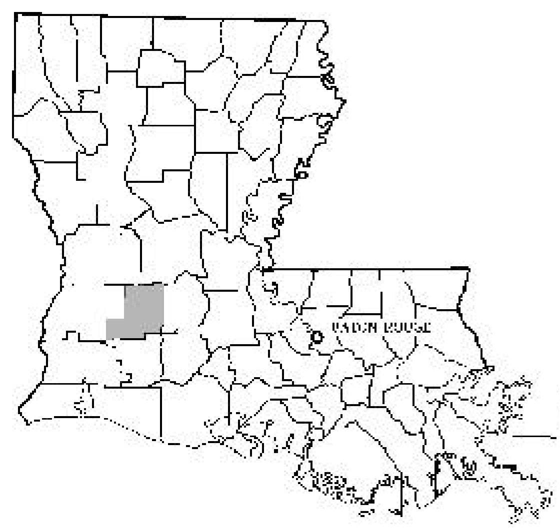

Figure 1.—Location of Jefferson Davis Parish in Louisiana

The Gulf Coast Marsh makes up about 2 percent of the parish. The soils in marshes are soft organic soils or firm, clayey mineral soils. They are ponded most of the time and subject to flooding. Areas of these soils are used mainly as habitat for wildlife and for recreation. Some of the firmer marsh areas are used as rangeland for cattle.

The flood plains make up the remaining 4 percent of the parish. These soils are loamy or clayey and are frequently flooded. The swamps included in this area are ponded most of the time. Most areas of these soils are used as woodland or for recreation areas and wildlife habitat.

General Nature of the Survey Area

This section gives general information concerning the parish. It discusses climate, history, water resources, agriculture, and transportation.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Jennings, Louisiana in the period 1961 to 1990. 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 52 degrees F and the average daily minimum temperature is 42 degrees. The lowest temperature on record, which occurred on December 23, 1989, is 10 degrees. In summer, the average temperature is 81 degrees and the average daily maximum temperature is 91 degrees. The highest recorded temperature, which occurred on August 8, 1962, is 102 degrees.

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

The total annual precipitation is about 59.13 inches. Of this, 39.28 inches, or about 66 percent, usually falls in March through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 12.20 inches on April 14, 1967. Thunderstorms occur on about 76 days each year, and most occur in July.

Tornadoes and severe thunderstorms occur occasionally. These storms are local and of short duration, and the pattern of damage is variable and spotty.

The average seasonal snowfall is 0.2 inch. Snow is seldom on the ground for more than one day. The greatest snow depth at any one time during the period of record was 5.6 inches on February 13, 1960.

The average relative humidity in midafternoon is about 62 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 80 percent of the time possible in summer and 56 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 10 miles per hour, in March.

History

Originally, the land that is now Jefferson Davis Parish was home to Indian tribes and wild animals. By 1891, this area had been settled by a mixed population of Creoles, Acadians, Americans from several states, and a few Indians. The area was sparsely settled, and the expansive prairies supported large herds of wild cattle and horses. Hogs also ranged freely. Homesites were generally near timber, where wood was readily available. The early settlers were of mostly French descent, and French remains a major language today.

The area of Jefferson Davis Parish was part of the “Imperial Calcasieu” Parish, which was established in 1840. On June 12, 1912, the present boundaries of the parish were established; and in October of the same year, Jennings was selected as the parish seat. Jefferson Davis Parish was named after the President of the Confederacy.

Oil was first discovered in Louisiana at the Jennings Oil Field on September 21, 1901. Today, Jennings is known as the “Cradle of Louisiana Oil,” and a replica of the rig used to drill the first productive oil well in Louisiana is located near Interstate 10 at the Oil and Gas Park in Jennings.

Water Resources

By Darwin Knochenmus, geologist, U.S. Geological Survey, Water Resources Division

Jefferson Davis Parish is endowed with a large quantity of good quality water. There are only a few places in the parish where the quality of the water is a concern. Because of its accessibility and ease of distribution, ground water is the predominant source of supply.

Fifty-five percent of the water withdrawn for all uses in the parish is ground water. In 1985, 124 million gallons per day was pumped from the Chicot aquifer. Of this quantity, 97 percent was used for irrigation, mostly for rice; 2 percent for public supply; 0.5 percent for rural uses; and about 0.5 percent for industry. Ground water is the sole source of water for public and rural supplies.

Surface water provides 45 percent of the water used in the parish. In 1985, the major use was for irrigation.

Southwestern Louisiana uses more water than any other area of the state, and in this part of the state, Jefferson Davis Parish ranks third in the amount of water used.

Ground Water

The major aquifer in Jefferson Davis Parish is the Chicot Aquifer System, which consists of the upper sand and the lower sand units *(7, 10, 22, 29)*. Most of the water is withdrawn from the upper sand unit. The upper sand unit yields large quantities of water, which are generally of good quality. All other major aquifers in the parish contain salt water.

The upper sand unit is a massive sand, averaging 300 to 400 feet in thickness. In most localities, a properly designed water well can produce 2,000 gallons a minute *(13, 22)*. The sand and clay beds thicken from north to south in the parish and dip farther below the land surface. The silty clay overburden averages about 75 feet in thickness.

There are about 500 large producing wells and observation wells in the parish and many more domestic wells *(7)*. Irrigation wells are generally between 300 and 400 feet deep; whereas, household wells generally are shallower and are drilled only into the top of the aquifer.

Water in the upper sand unit of the Chicot Aquifer System in Jefferson Davis Parish is recharged from rainfall in Allen Parish. The silty clay overburden on the soils in Jefferson Davis Parish restricts direct recharge from the land surface to the upper sand. However, water leaking from existing wells percolates downward in a circuitous path through thin sand lenses in the silty clay overburden. This leakage provides a significant quantity, about 50 percent of the water, to wells.

Throughout the parish, the water level in the upper sand unit is below sea level. Large withdrawals of ground water for rice irrigation in Jefferson Davis and Acadia Parishes have caused a large cone-of-depression in the aquifer *(13)*. Most of the water in the upper sand unit flows from the north to the cone-of-depression in the center of the parish. Only a small amount of water flows from the south to the center of the parish.

Seasonal water level fluctuations average from 25 to 30 feet as a result of seasonal pumping for irrigation. Fluctuations from year to year are minor (about 5 feet). This indicates water levels have reached an equilibrium under current pumping conditions. The depth to water in wells open to the aquifer is about 40 feet below the land surface.

Surface Water

Surface water in the parish is limited and underdeveloped because much of the parish is in the interfluves between the Calcasieu River to the west and Bayou Nezpique to the east and in the headwaters of Bayou Lacassine. Headwaters and interfluves have relatively small streams and correspondingly small flows; thus, the potential to develop large water supplies is limited. Also, because the ground water resource is significant, there is less need to develop the surface-water resource. However, the surface water that is available has been utilized extensively for irrigation. On an annual basis, surface runoff from the parish averages 1 million gallons per day per square mile *(14)*.

Water Quality

The ground water in Jefferson Davis Parish is generally hard and has an equivalent calcium carbonate concentration of 120 to 180 milligrams per liter *(17, 18)*. It is high in iron content (1.0-5.0 milligrams per liter), moderately mineralized (325-525 milligrams per liter), and low in sodium (50 milligrams per liter) and nitrate (1-10 milligrams per liter). The quality of ground water generally improves with depth, except near saltwater interfaces where the content of chloride and sodium increases. Because of the low sodium content and high degree of hardness, these waters are well suited to irrigation. However, for public supply or domestic use, special treatment is needed to remove the content of iron and to reduce hardness. At the present time, organic contamination of ground water in the Chicot Aquifer System is not a problem.

Salt water occurs at the bottom of the upper sand aquifer in the very southern part of the parish near Lake Arthur and Thornwell. In the lower sand, salt water extends northward almost to Hathaway and Fenton.

Surface water is of good quality, but it is highly colored. It is low in mineralization, very soft, and high in iron content.

Hydrologic Problems

There are three major hydrologic concerns in the parish. Two are related to flooding and the third to saltwater encroachment.

High water tables are in areas where the soils are clayey or where the overburden contains more clay than silt; thus, prohibiting the downward percolation of rainfall. Because of the high rainfall, many of the soils are often saturated and have a perched water table that is at or near the surface. In areas where hydrostatic pressure in the aquifer is equal to or greater than the land surface elevation, there is no gradient to move water downward through the soil, and high water tables persist.

Flooding or ponding also occurs where the land surface is level or depressional and runoff is very low.

Where wells are designed to pump from the bottom of aquifers and the wells are heavily pumped, salt water can flow toward and contaminate the well. In areas where salt water is known to exist in the lower part of the aquifer, wells can be designed to withdraw water from the upper part of the aquifer.

Agriculture

Jefferson Davis Parish has the natural resources to support a large agricultural economy. In 1997, there were 777 farms in the parish, according to the Louisiana Cooperative Extension Service. The average size was about 535 acres. In 1997, there were about 253,000 acres of cropland, 42,000 acres of grazing land, 50,500 acres of woodland, and 75,500 acres of other lands, including urban land and marshland.

The main crops grown in the parish are rice, soybeans, sugarcane, wheat, and grain sorghum. Crawfish are produced on about 6,000 acres of the cropland.

The topography, soils, climate, and an ample supply of fresh water explain why this parish is one of the leading rice producing areas in the state. In recent years, the acreage planted to rice has decreased substantially, and the acreage of soybeans has stabilized. However, rice is expected to continue to provide a large part of the farm income in the parish.

Transportation

Jefferson Davis Parish is served by two major railroads that connect to every major railroad system in the United States. There are three U.S. highways, one interstate highway, and numerous other paved state and parish roads.

The parish has two municipal airports, one in Jennings and one in Welsh. There also are numerous other small landing strips throughout the parish.

There are several motor freight lines that operate throughout the parish. Some handle oil field freight. Several taxi companies operate within Jennings, Lake Arthur, and Welsh. Two major bus lines serve the area.

The parish also has several navigable waterways. Bayou Nezpique, which flows into the Mermentau River, makes up the eastern boundary. The Intracoastal Canal is just four miles south of the parish line. In the western part of the parish, Lacassine Bayou, provides a transportation route for smaller craft.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; and the kinds of crops and native plants growing on the soils. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

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

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

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, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The soils in the survey area vary widely in their suitability for major land uses. Table 4 shows the extent of the map units shown on the general soil map. It lists the suitability of each, in relation to that of the other map units, for major land uses and lists soil properties that limit use. Soil suitability ratings are based on the practices commonly used in the survey area to overcome soil limitations. These ratings reflect the ease of overcoming the limitations. They also reflect the problems that will persist even if such practices are used.

Each map unit is rated for *cultivated crops, pasture, woodland, urban uses,* and *intensive recreation areas*. Cultivated crops are those grown extensively in the survey area. Pasture refers to land that is producing either native grasses or introduced grasses and legumes for livestock grazing. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments. Intensive recreation areas are campsites, picnic areas, ballfields, and other areas that are subject to heavy foot traffic.

Soils on Terraces

The nine map units of this group consist of somewhat excessively drained to poorly drained loamy, sandy, and clayey soils. These 9 map units make up about 94 percent of the parish. Most of the soils are used as woodland or cropland. Seasonal wetness and susceptibility to erosion are the main limitations for most uses. Flooding is a hazard in some soils.

1. Caddo-Glenmora-Messer

Level to gently sloping, poorly drained and moderately well drained soils that are loamy throughout

This map unit consists of soils on broad flats, mounds or smoothed mound areas, ridgetops, and side slopes. Slopes range from 0 to 5 percent.

This map unit makes up about 1 percent of the parish. It is about 39 percent Caddo soils, 30 percent Glenmora soils, 19 percent Messer soils, and 12 percent soils of minor extent.

The Caddo soils are level and are poorly drained. They are in intermound areas on broad flats. These soils have a dark grayish brown silt loam surface layer and a grayish brown and light brownish gray, mottled silt loam subsurface layer. The subsoil is gray, mottled silty clay loam and light brownish gray silt loam in the upper part; gray, mottled silty clay loam and light gray silt loam in the middle part; and gray and grayish brown, mottled silty clay loam in the lower part.

The Glenmora soils are very gently sloping and are moderately well drained. They are on ridgetops and side slopes. These soils have a brown silt loam surface layer. The subsurface layer is yellowish brown silt loam. The subsoil is yellowish brown, mottled silt loam and silty clay loam and gray silt loam.

The Messer soils are level or gently sloping and are moderately well drained. They are on low circular mounds or smoothed mound areas. These soils have a dark grayish brown silt loam surface layer. The subsurface layer is light yellowish brown silt loam. The subsoil is light yellowish brown and light yellowish brown, mottled silt loam in the upper part; pale brown, mottled silty clay loam and light gray silt loam in the next part; and brown, mottled silty clay loam in the lower part.

Of minor extent are the somewhat poorly drained Acadia soils on side slopes and the poorly drained Guyton soils on broad flats and in swales and depressional areas. The very gently sloping Acadia soils make up the largest acreage of the minor soils.

Most of the soils in this map unit are used as woodland, mainly pine trees. A small acreage is used for crops and pasture.

The Caddo and Messer soils in this map unit are moderately well suited to woodland. The Glenmora soils are well suited to this use. Wetness limits the use of equipment and increases the risk of soil compaction in most areas. Seedling mortality is moderate in areas of the Caddo soils because of wetness. Competition from understory plants is moderate or severe.

The soils in this map unit are mostly moderately well suited to crops and pasture. The Glenmora soils are well suited to pasture. Wetness is the main limitation for these uses on level soils, and erosion is a hazard on sloping soils. Low fertility and potentially toxic levels of exchangeable aluminum within the root zone are additional limitations. In level areas, a surface drainage system can improve the soils for crops and pasture. Soil losses from erosion can be minimized by use of minimum tillage, contour farming, and grassed waterways. Applications of fertilizer and lime are needed in these areas.

The Caddo soils in this map unit are mostly poorly suited to urban development and intensive recreation areas. The Messer and Glenmora soils are moderately well suited to these uses. Wetness, the slow permeability, the low to moderate shrink-swell potential, and low strength on sites for local roads and streets are the main limitations.

2. Kinder-Leton-Messer

Level to gently sloping, poorly drained and moderately well drained soils that are loamy throughout

This map unit consists of soils on broad flats, mounds or smoothed mound areas, along drainageways, and in depressions. The Leton soils are subject to flooding. Slopes range from 0 to 5 percent.

This map unit makes up about 7 percent of the parish. It is about 46 percent Kinder soils, 29 percent Leton soils, 20 percent Messer soils, and 5 percent soils of minor extent.

The Kinder soils are level and are poorly drained. They are in intermound areas on broad flats. These soils have a dark gray silt loam surface layer and a grayish brown silt loam subsurface layer. The subsoil is grayish brown, mottled silty clay loam and silt loam in the upper part; mainly grayish brown, mottled silty clay loam the middle part; and light brownish gray, mottled silty clay loam in the lower part. The underlying material is light brownish gray silt loam and silty clay loam and gray silt loam.

The Leton soils are level and are poorly drained. They are subject to rare or occasional flooding. These soils are on broad flats, along drainageways, and in depressions. They have a grayish brown silt loam surface layer and subsurface layer. The upper part of the subsoil is light brownish gray, mottled silty clay loam and grayish loam. The lower part of the subsoil is light brownish gray, mottled silty clay loam. The underlying material is light brownish gray, mottled clay loam.

The Messer soils are level or gently sloping and are moderately well drained. They are on low circular mounds or smoothed mound areas. These soils have a dark grayish brown silt loam surface layer. The subsurface layer is light yellowish brown silt loam. The subsoil is light yellowish brown and mottled, light yellowish brown silt loam in the upper part; pale brown, mottled silty clay loam and light gray silt loam in the next part; and brown, mottled silty clay loam in the lower part.

Of minor extent are the somewhat poorly drained Acadia soils and the moderately well drained Gore soils on side slopes along drainageways. The very gently sloping Acadia soils make up the largest acreage of the minor soils.

Most of the soils in this map unit are used as woodland and cropland. A small acreage is used for pasture. Soybeans and rice are the main crops.

The soils in this map unit are moderately well suited to woodland, mainly pine trees. The main concern in producing and harvesting timber is wetness, which restricts use of equipment and increases the risk of soil compaction. Flooding and wetness cause seedling mortality in areas of the Leton soils. In addition, competition from understory plants can be severe.

The soils in this map unit are moderately well suited to cultivated crops and pasture. Wetness, low fertility, and potentially toxic levels of exchangeable aluminum are the main limitations. Flooding is a hazard along drainageways and in some depressional areas, and erosion is a hazard on slopes. A good drainage system can improve the soils for most cultivated crops and pasture plants. Most crops and pasture plants respond well to additions of lime and fertilizer.

The soils in this map unit are poorly suited to urban development and intensive recreation areas. Wetness, the slow permeability, and low strength on sites for local roads and streets are the main limitations. Flooding is a hazard in areas of the Leton soils.

3. Crowley-Vidrine-Mowata

Level and very gently sloping, poorly drained to moderately well drained soils that have a loamy surface layer and a loamy and clayey subsoil

This map unit consists of soils on broad convex ridges and side slopes of broad convex ridges, on mounds or smoothed mound areas, on broad flats, and along drainageways. Slopes range from 0 to 3 percent.

This map unit make up about 49 percent of the parish. It is about 38 percent Crowley soils, 25 percent Vidrine soils, 8 percent Mowata soils, and 29 percent soils of minor extent.

The Crowley soils are level and very gently sloping and are somewhat poorly drained. They are on broad convex ridges and on side slopes of broad convex ridges. These soils have a dark grayish brown silt loam surface layer and a grayish brown, mottled silt loam subsurface layer. The subsoil is grayish brown, mottled silty clay in the upper part and light brownish gray and grayish brown, mottled clay loam in the middle and lower parts.

The Vidrine soils are level and very gently sloping and are moderately well drained and somewhat poorly drained. They are on mounds or smoothed mound areas and on side slopes of broad convex ridges. These soils have a dark grayish brown silt loam surface layer. The subsoil is brown silt loam in the upper part; grayish brown, mottled silty clay and pale brown silt loam in the next part; grayish brown and light brownish gray mottled silty clay in the next part; and light brownish gray, mottled silty clay loam in the lower part.

The Mowata soils are level and are poorly drained. They are subject to rare flooding. These soils are in intermound areas within broad flats and are along drainageways. They have a grayish brown silt loam surface layer and subsurface layer. The upper part of the subsoil is light brownish gray, mottled silty clay and grayish brown silt loam. The lower part of the subsoil is light brownish gray, mottled silty clay.

Of minor extent are the somewhat poorly drained Kaplan soils on broad, slightly convex ridges and on side slopes along abandoned stream channels; the poorly drained Leton soils on broad flats along drainageways and in depressions; and the poorly drained Midland soils on broad flats and in slightly concave areas. The Kaplan and Midland soils make up the largest acreage of the minor soils.

Most of the soils in this map unit are used as cropland. A small acreage is used as pasture, woodland, or homesites. Soybeans and rice are the main crops.

The soils in this map unit are moderately well suited to cultivated crops and pasture. Wetness, medium fertility, and potentially toxic levels of exchangeable aluminum are the main limitations. Erosion is a hazard in sloping areas. Surface drainage and additions of lime and fertilizer improve the soils for most cultivated crops and pasture plants.

The soils in this map unit are moderately well suited to woodland, mainly pine trees. Wetness limits the use of equipment, increases the risk of soil compaction, and causes slight to moderate seedling mortality. In addition, competition from understory plants is severe.

The soils in this map unit are poorly suited to urban development and intensive recreation areas. Wetness, the high shrink-swell potential, the very slow or slow permeability, and low strength on sites for local roads and streets are the main limitations. Flooding is a hazard in areas of the Mowata soils.

4. Kaplan-Mowata-Leton

Level and very gently sloping, somewhat poorly drained and poorly drained soils that have a loamy surface layer and a clayey, clayey and loamy, or loamy subsoil

This map unit consists of soils on broad, slightly convex ridges, on side slopes along abandoned stream channels, on broad flats, in intermound areas on broad flats, in depressions, and along drainageways. The Mowata and Leton soils are subject to flooding. Slopes range from 0 to 3 percent.

This map unit makes up about 4 percent of the parish. It is about 65 percent Kaplan soils, 15 percent Mowata soils, 15 percent Leton soils, and 5 percent soils of minor extent.

The Kaplan soils are level and very gently sloping and are somewhat poorly drained. They are on broad, slightly convex ridges and on side slopes along abandoned stream channels. These soils have a dark grayish brown silt loam surface layer. The next layer is dark gray silt loam. The subsoil is dark gray, gray, light olive brown, and light gray, mottled silty clay.

The Mowata soils are level and are poorly drained. They are subject to rare flooding. They are on broad flats, in intermound areas on broad flats, and along drainageways. These soils have a grayish brown silt loam surface layer and subsurface layer. The upper part of the subsoil is light brownish gray, mottled silty clay and grayish brown silt loam. The lower part of the subsoil is light brownish gray, mottled silty clay.

The Leton soils are level and are poorly drained. They are on broad flats, in depressions, and along drainageways. These soils are subject to rare or occasional flooding. They have a grayish brown silt loam surface layer and subsurface layer. The upper part of the subsoil is light brownish gray, mottled silty clay loam and gray loam. The lower part of the subsoil is light brownish gray, mottled silty clay loam. The underlying material is light brownish gray, mottled clay loam.

Of minor extent are the somewhat poorly drained Crowley soils on broad convex ridges; the poorly drained Morey soils on broad flats; and the somewhat poorly drained Vidrine soils on mounds or smoothed mound areas and on side slopes of relict natural levees. The Morey soils make up the largest acreage of the minor soils.

The soils in this map unit are mainly used as cropland. A small acreage is used as pasture, woodland, or homesites. Soybeans and rice are the main crops.

The soils in this map unit are mostly moderately well suited to cultivated crops and pasture. Some areas of the Leton soils are occasionally flooded and are poorly suited to crops. Wetness, low or medium fertility, and potentially toxic levels of exchangeable aluminum are the main limitations. Erosion is a hazard in sloping soils. Surface drainage and additions of fertilizer improve the soils for most cultivated crops and pasture plants.

The soils in this map unit are moderately well suited to woodland, mainly pine trees. Wetness and flooding limit the use of equipment, increase the risk of soil compaction, and cause slight to moderate seedling mortality. Also, competition from understory plants is severe.

The soils in this map unit are poorly suited to urban development. The Kaplan soils are moderately well suited to intensive recreation areas. The Mowata and Leton soils are poorly suited to intensive recreation areas. Wetness, the very slow or slow permeability, the moderate or high shrink-swell potential, and low strength on sites for local roads and streets are the main limitations. Flooding is a hazard in areas of Mowata and Leton soils.

5. Kaplan-Midland

Level and very gently sloping, somewhat poorly drained and poorly drained soils that have a loamy surface layer and a clayey or clayey and loamy subsoil

This map unit consists of soils on broad, slightly convex ridges, on side slopes along abandoned stream channels, on broad flats, and in slightly concave areas. Slopes range from 0 to 3 percent.

This map unit makes up about 18 percent of the parish. It is about 72 percent Kaplan soils, 23 percent Midland soils, and 5 percent soils of minor extent.

The Kaplan soils are level and very gently sloping and are somewhat poorly drained. They are on broad, slightly convex ridges and on side slopes along abandoned stream channels. These soils have a dark grayish brown silt loam surface layer. The next layer is dark gray silt loam. The subsoil is dark gray, gray, light olive brown, and light gray, mottled silty clay.

The Midland soils are level and are poorly drained. They are on broad flats and in slightly concave areas. These soils have a dark gray, mottled silt loam surface layer. The subsoil is dark gray, mottled silty clay loam in the upper part and gray, mottled silty clay in the middle and lower parts.

Of minor extent are the somewhat poorly drained Crowley soils on broad convex ridges; the very poorly drained Ged soils in marshy areas; the poorly drained Judice, Morey, and Mowata soils on broad flats, broad depressional areas, and along drainageways; and the somewhat poorly drained Vidrine soils on low mounds or smoothed mound areas and on side slopes of relict natural levees. The Crowley soils make up the largest acreage of the minor soils.

Most of the soils in this map unit are used for cultivated crops. Small acreages are used as pasture or homesites. Rice and soybeans are the main crops.

The soils in this map unit are dominantly moderately well suited to cultivated crops and are well suited to pasture. The Midland soils are moderately well suited to pasture. Wetness and medium fertility are the main limitations. Erosion is a hazard in sloping areas. A good surface drainage system and additions of fertilizer improve the soils for crops and pasture.

The soils in this map unit are moderately well suited to woodland. Wetness restricts use of equipment, increases the risk of soil compaction, and causes slight or moderate seedling mortality. Also, competition from understory plants is severe.

The soils in this map unit are dominantly poorly suited to urban development and moderately well suited to intensive recreation areas. The Midland soils are poorly suited to intensive recreation areas. Wetness, the slow or very slow permeability, the moderate or high shrink-swell potential, and low strength on sites for local roads and streets are the main limitations. Flooding is a hazard in areas of Midland soils.

6. Crowley-Vidrine-Pineisland

Level and very gently sloping, somewhat poorly drained and moderately well drained soils that have a loamy surface layer and a clayey and loamy or loamy subsoil

This map unit consists of soils on broad convex ridges, side slopes of broad convex ridges or relict natural levees, and mounds or smoothed mound areas. Slopes range from 0 to 3 percent.

This map unit makes up about 4 percent of the parish. It is about 48 percent Crowley soils, 35 percent Vidrine soils, 7 percent Pineisland soils, and 10 percent soils of minor extent.

The Crowley soils are level and very gently sloping and are somewhat poorly drained. They are on broad convex ridges and side slopes of broad convex ridges. These soils have a dark grayish brown silt loam surface layer and a grayish brown, mottled silt loam subsurface layer. The subsoil is grayish brown, mottled silty clay in the upper part and light brownish gray and grayish brown, mottled clay loam in the middle and lower parts.

The Vidrine soils are level and very gently sloping and are moderately well drained to somewhat poorly drained. They are on mounds or smoothed mound areas and on side slopes of relict natural levees. These soils have a dark grayish brown silt loam surface layer. The next layer is brown silt loam. The subsoil is grayish brown, mottled silty clay and pale brown silt loam in the upper part; grayish brown and light brownish gray, mottled silty clay in the next part; and light brownish gray, mottled silty clay loam in the lower part.

The Pineisland soils are very gently sloping and are moderately well drained. They are on side slopes of relict natural levees. These soils have a dark grayish brown, mottled loam surface layer and a dark yellowish brown loam subsurface layer. The upper part of the subsoil is yellowish brown loam and dark brown clay loam. The next part is brownish yellow clay loam and yellowish brown silt loam. Below this is a dense, brittle layer that is reddish yellow and yellow clay loam. The lower part of the subsoil is red, mottled sandy clay loam.

Of minor extent are the somewhat poorly drained Kaplan soils on broad, slightly convex ridges and on side slopes along abandoned stream channels; and the poorly drained Leton and Mowata soils on broad flats, along drainageways, and in depressions and intermound areas on broad flats. The Leton and Mowata soils make up the largest acreage of these minor soils.

The soils in this map unit are mainly used as cropland and woodland. Small acreages are used as pasture or homesites. Soybeans and rice are the main crops.

The soils in this map unit are moderately well suited to cultivated crops and pasture. Wetness, low and medium fertility, and potentially toxic levels of exchangeable aluminum are the main limitations. The restricted rooting depth in the Pineisland soils is an additional limitation. Erosion is a hazard in sloping areas. Additions of lime and fertilizer improve the soils for most cultivated crops and pasture plants. In sloping areas, soil losses from erosion can be minimized by conservation tillage, contour farming, and grassed waterways.

The soils in this map unit are moderately well suited to woodland, mainly pine trees. Wetness limits the use of equipment, increases the risk of soil compaction, and causes slight to moderate seedling mortality. Also, competition from unwanted understory plants is severe. The restricted rooting depth in the Pineisland soil can limit growth of trees.

The soils in this map unit are poorly suited to urban development and intensive recreation areas. Wetness, the low to high shrink-swell potential, the very slow to moderately slow permeability, and low strength on sites for local roads and streets are the main limitations for this use.

7. Morey-Leton-Mowata

Level, poorly drained soils that have a loamy surface layer and a loamy or loamy and clayey subsoil

This map unit consists of soils on broad flats, in depressions, in intermound areas on broad flats, and along drainageways. The soils are subject to flooding. Slope is less than 1 percent.

This map unit makes up about 2 percent of the parish. It is about 54 percent Morey soils, 27 percent Leton soils, 14 percent Mowata soils, and 5 percent soils of minor extent.

The Morey soils are on broad flats. They are subject to rare flooding. These soils have a surface layer of very dark gray loam. The upper part of the subsoil is very dark gray, mottled loam. It is dark gray and gray, mottled clay loam in the lower part.

The Leton soils are on broad flats, in depressions, and along drainageways. They are subject to rare or occasional flooding. These soils have a surface layer and a subsurface layer of grayish brown silt loam. The upper part of the subsoil is light brownish gray, mottled silty clay loam and gray loam. The lower part of the subsoil and the underlying material are light brownish gray, mottled silty clay loam.

The Mowata soils are on broad flats, in intermound areas on broad flats, and along drainageways. They are subject to rare flooding. These soils have a surface layer and subsurface layer of grayish brown silt loam. The upper part of the subsoil is light brownish gray, mottled silty clay and grayish brown silt loam. The lower part of the subsoil is light brownish gray, mottled silty clay.

Of minor extent are the somewhat poorly drained Crowley soils on broad convex ridges and their side slopes; and the somewhat poorly drained Vidrine soils on mounds or smoothed mound areas and on side slopes of relict natural levees. The Crowley soils make up the largest acreage of the minor soils.

The soils in this map unit are mainly used as cropland. A small acreage is used as pasture, woodland, or homesites. Soybeans and rice are the main crops.

The soils in this map unit are moderately well suited to cultivated crops and pasture. Wetness, low and medium fertility, and potentially toxic levels of exchangeable aluminum are the main limitations. Occasional flooding is a hazard in some areas of the Leton soils. Surface drainage and additions of lime and fertilizer improve the soils for most cultivated crops and pasture plants.

The soils in this map unit are moderately well suited to woodland, mainly pine trees. Wetness limits the use of equipment, increases the risk of soil compaction, and causes moderate to severe seedling mortality. Also, competition from undesirable understory plants is severe.

The soils in this map unit are poorly suited to urban development and intensive recreation areas. Wetness, the slow or very slow permeability, the low to high shrink-swell potential, and low strength on sites for local roads and streets are the main limitations. Flooding is a hazard.

8. Midland-Morey-Judice

Level, poorly drained soils that have a loamy or clayey surface layer and a clayey and loamy, loamy, or clayey subsoil

This map unit consists of soils on broad flats and in slightly concave areas and broad depressional areas. The soils are subject to rare flooding. Slope is less than 1 percent.

This map unit makes up about 8 percent of the parish. It is about 51 percent Midland soils, 26 percent Morey soils, 15 percent Judice soils, and 8 percent soils of minor extent.

The Midland soils are on broad flats and in slightly concave areas. These soils have a surface layer of dark gray, mottled silt loam. The subsoil is dark gray, mottled silty clay loam in the upper part and gray, mottled silty clay in the middle and lower parts.

The Morey soils are on broad flats. These soils have a surface layer of very dark gray loam. The upper part of the subsoil is very dark gray, mottled loam. The lower part of the subsoil is dark gray and gray, mottled clay loam.

The Judice soils are in broad depressional areas. These soils have a surface layer of black silty clay. The next layer is very dark gray silty clay. The subsoil is gray, mottled silty clay in the upper part and light gray, mottled silty clay in the middle and lower parts.

Of minor extent are the somewhat poorly drained Crowley and Kaplan soils on broad convex or slightly convex ridges and on side slopes of broad convex ridges; the poorly drained Leton and Mowata soils on broad flats, in intermound areas on broad flats, in depressions, and along drainageways; and the somewhat poorly drained Vidrine soils on mounds or smoothed mound areas and on side slopes of relict natural levees. Also included are the very poorly drained Ged soils in marshy areas. The Kaplan and Ged soils make up the largest acreage of the minor soils.

Most of the soils in this map unit are used for cultivated crops. A small acreage is used as pasture or homesites. Rice and soybeans are the main crops.

The soils in this map unit are moderately well suited to cultivated crops and pasture. Wetness, poor tilth, and medium fertility are the main limitations. A good surface drainage system and additions of lime and fertilizer improve the soils for crops and pasture.

The soils in this map unit are moderately well suited to woodland. Wetness limits the use of equipment, increases the risk of soil compaction, and causes moderate or severe seedling mortality. Also, competition from undesirable understory plants is severe.

The soils in this map unit are poorly suited to urban development and intensive recreation areas. Wetness, the slow or very slow permeability, the high shrink-swell potential, and low strength on sites for local roads and streets are the main limitations. Flooding is a hazard.

9. Bienville-Cahaba-Guyton

Level to gently undulating, somewhat excessively drained, well drained, and poorly drained soils that have a sandy or loamy surface layer and a sandy or loamy subsoil

This map unit consists of soils on low ridges, in swales, on broad flats, and in depressions. The Guyton soils and some areas of the Bienville soils are subject to flooding. Slopes range from 0 to 3 percent.

This map unit makes up about 1 percent of the parish. It is about 47 percent Bienville soils, 32 percent Cahaba soils, 15 percent Guyton soils, and 6 percent soils of minor extent.

The Bienville soils are very gently sloping and gently undulating and are somewhat excessively drained. They are on low convex ridges. Some areas of these soils are frequently flooded. These soils have a surface layer of dark yellowish brown or brown loamy fine sand and a subsurface layer of yellowish brown loamy fine sand. The subsoil is strong brown loamy fine sand.

The Cahaba soils are very gently sloping and are well drained. They are on ridges. These soils have a surface layer of dark grayish brown and brown fine sandy loam. The subsurface layer is light yellowish brown fine sandy loam. The upper part of the subsoil is yellowish red and light yellowish brown fine sandy loam. The lower part of the subsoil is yellowish red, mottled loam. The underlying material is strong brown, mottled loamy sand.

The Guyton soils are level and are poorly drained. They are on broad flats and in swales and other depressional areas. They are occasionally flooded. These soils have a surface layer of grayish brown or dark grayish brown silt loam and a subsurface layer of light brownish gray, mottled silt loam. The upper part of the subsoil is grayish brown, mottled silty clay loam and light brownish gray silt loam. The lower part of the subsoil and the underlying material are light brownish gray, mottled silty clay loam.

Of minor extent are the poorly drained Caddo and Kinder soils in intermound areas on broad flats, the moderately well drained Glenmora soils on ridgetops and side slopes, and the moderately well drained Messer soils on mounds or smoothed mound areas. Also, the somewhat poorly drained Acadia soils and the moderately well drained Gore soils are on side slopes along drainageways.

Most of the soils in this map unit are used as woodland. A small acreage is used as pasture, cropland, or homesites. Soybeans is the main crop.

The soils in this map unit are mostly moderately well suited to woodland, mainly pine trees. The Cahaba soils are well suited to this use. The main concerns in producing and harvesting timber are the risk of soil compaction caused by wetness; equipment use limitations caused by wetness or the sandy surface layer; and the seedling mortality caused by wetness, flooding, or soil droughtiness. Also, competition from undesirable understory plants is slight to severe.

The soils in this map unit are moderately well suited to pasture and cultivated crops. The main limitations to these uses are low fertility in all of the soils, wetness in the Guyton soils, and droughtiness in the Bienville soils. Also, the Cahaba and Guyton soils have potentially toxic levels of exchangeable aluminum. Erosion is a hazard in sloping areas. Flooding is a hazard in areas of the Guyton soils and in some areas of the Bienville soils. Surface drainage and protection from flooding can improve the Guyton soils for crops and pasture. Additions of fertilizer and lime are needed for crops and pasture.

The soils in this map unit are mostly moderately well suited to urban development and intensive recreation areas. The Cahaba soils are well suited to these uses, and the Guyton soils are poorly suited. In areas of the Guyton soil, wetness, the slow permeability, and low strength on sites for local roads and streets are the main limitations. Flooding is the main hazard. In areas of the Bienville soils, soil droughtiness and the moderately rapid permeability are the main limitations. Flooding is a hazard in some areas of the Bienville soils.

Soils on Flood Plains

The map unit in this group consists of poorly drained and well drained, loamy soils on flood plains. The soils are frequently flooded. This map unit makes up about 2 percent of the parish. Most of the soils are used as woodland. Wetness, which is caused by flooding and a seasonal high water table, is the main limitation.

10. Basile-Guyton-Cascilla

Level, poorly drained and well drained soils that are loamy throughout

This map unit consists of soils in low or depressional areas and on low ridges or natural levees on flood plains. These soils are frequently flooded. Slopes range from 0 to 2 percent.

This map unit makes up about 2 percent of the parish. It is about 47 percent Basile soils, 25 percent Guyton soils, 23 percent Cascilla soils, and 5 percent soils of minor extent.

The Basile soils are poorly drained. They are in low areas and depressional areas. These soils have a surface layer of grayish brown silt loam and a subsurface layer of light gray, mottled silt loam. The subsoil is grayish brown, mottled silty clay loam and light gray silt loam in the upper part; gray, mottled silty clay loam in the middle part; and grayish brown, mottled silty clay loam in the lower part.

The Guyton soils are poorly drained. They are in low positions. These soils have a surface layer of grayish brown or dark grayish brown silt loam and a subsurface layer of light brownish gray, mottled silt loam. The upper part of the subsoil is grayish brown, mottled silty clay loam and light brownish gray silt loam. The lower part of the subsoil and the underlying material are light brownish gray, mottled silty clay loam.

The Cascilla soils are well drained. They are on low ridges or natural levees. These soils have a surface layer of dark brown silt loam. The subsoil is brown silt loam in the upper part; brown, mottled silt loam in the middle part; and brown and yellowish brown, mottled silty clay loam in the lower part.

Of minor extent are the somewhat excessively drained Bienville soils on ridges and the very poorly drained Arat and Barbary soils in swamps.

Most of the soils in this map unit are used as woodland. A small acreage is used for pasture.

The soils in this map unit are moderately well suited to woodland. The main concerns in producing and harvesting timber are the moderate or severe equipment limitations, the risk of soil compaction, and the severe seedling mortality caused by wetness and flooding.

The soils in this map unit are poorly suited to crops and pasture. Flooding is the main hazard, and wetness is the main limitation.

The soils in this map unit are generally not suited to urban development or to intensive recreation areas. Wetness and flooding are too severe for this use.

Soils in Swamps and Marshes

The two map units in this group consist mainly of level, very poorly drained, loamy, mucky, and clayey soils in swamps and marshes. These soils are ponded most of the time and are frequently flooded. These map units make up about 4 percent of the parish. Most of the soils are in native vegetation and are used for recreation and as habitat for wetland wildlife.

11. Barbary-Arat

Level, very poorly drained soils that are very fluid or slightly fluid and are clayey or loamy throughout; in swamps

This map unit consists of soils in swamps that are ponded most of the time and are frequently flooded. Slope is less than 1 percent.

This map unit makes up about 2 percent of the parish. It is about 49 percent Barbary soils, 42 percent Arat soils, and 9 percent soils of minor extent.

The Barbary soils have a surface layer of dark grayish brown mucky clay that is slightly fluid. The underlying material is dark gray clay that is very fluid in the upper part and slightly fluid in the lower part. The underlying material also contains many logs and fragments of wood in the lower part.

The Arat soils have a surface layer of very dark grayish brown mucky silt loam that is very fluid. The underlying material is dark grayish brown, very fluid silt loam and silty clay loam. The underlying material contains many logs and partially decomposed wood fragments in the lower part.

Of minor extent are the very poorly drained Allemands and Ged soils in nearby marshes and the poorly drained Basile and Guyton soils on flood plains.

Most of the soils in this map unit are used as woodland, as habitat for wetland wildlife, and as recreation areas.

The soils in this map unit are poorly suited to woodland because of wetness, ponding, flooding, and low strength. Special equipment is needed to harvest trees, mainly baldcypress and water tupelo; and regrowth of trees after harvesting is slow.

The soils in this map unit are well suited to use as habitat for wetland wildlife and for recreation. They provide habitat for waterfowl, furbearers, alligators, squirrels, crawfish, and nongame birds. Hunting and other outdoor activities are important in areas of this map unit.

The soils in this map unit are not suited to cropland, pasture, or to urban development. Wetness, ponding, flooding, and low strength are too severe for these uses.

12. Ged-Allemands

Level, very poorly drained soils that have a very fluid and slightly fluid clayey surface layer or a very fluid mucky surface layer; and a firm or slightly fluid clayey subsoil or a very fluid clayey underlying material; in marshes

This map unit consist of soils in freshwater marshes that are ponded most of the time and are frequently flooded. Slope is less than 1 percent.

This map unit makes up about 2 percent of the parish. It is about 63 percent Ged soils, 25 percent Allemands soils, and 12 percent soils of minor extent.

The Ged soils have a surface layer of dark gray, very fluid clay. The next layer is very dark gray, slightly fluid clay. The subsoil is dark gray, mottled, firm clay in the upper part and gray, mottled, firm silty clay in the lower part.

The Allemands soils have a surface layer of very fluid muck. It is dark brown in the upper part, dark grayish brown in the next part, and black in the lower part. The next layer is black, very fluid mucky clay. The underlying material is gray, very fluid clay.

Of minor extent are the very poorly drained Arat and Barbary soils in nearby swamps and the poorly drained Judice, Midland, and Morey soils on nearby terraces.

Most of the soils in this map unit are in native vegetation and are used as habitat for wetland wildlife and recreation. A few areas of the Ged soils are used as range.

The soils in this map unit are well suited to use as habitat for wetland wildlife. They provide habitat for many species and provide areas for hunting, fishing, and other outdoor activities.

The soils in this map unit are not suited to cropland, pasture, woodland, urban development, or to intensive recreation areas. Flooding, ponding, wetness, and low strength are too severe for these uses. Drainage and protection from flooding are possible only by constructing an extensive system of levees and by installing water pumps.

Detailed Soil Map Units

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

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit 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*. 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, slope, wetness, frequency of flooding, 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, Guyton silt loam, occasionally flooded, is a phase of the Guyton series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are called complexes and undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Crowley-Vidrine silt loams, 0 to 1 percent slopes, is an example.

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

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, sand and gravel, is an example.

The soils on the detailed soil maps were mapped at the same level of detail, except for those soils that are used primarily for woodland and for wetland wildlife habitat. Fewer onsite observations were made in these areas, and delineations and included areas are generally larger.

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

AcB—Acadia silt loam, 1 to 3 percent slopes. This soil is very gently sloping and somewhat poorly drained. It is on side slopes along drainageways on terraces of the Gulf Coast Prairies. Areas are irregular in shape and range from 40 to 350 acres.

Typically, the surface layer is dark brown silt loam about 4 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 2 inches thick. The subsoil, from a depth of 6 to 14 inches, is yellowish brown, mottled silt loam; from a depth of 14 to 41 inches, it is light yellowish brown and grayish brown, mottled silty clay; from a depth of 41 to 60 inches, it is light brownish gray and red, mottled silty clay loam; and from a depth of 60 to 80 inches, it is yellowish red and strong brown, mottled silt loam.

Included in this map unit are a few small areas of Crowley, Gore, Kaplan, and Kinder soils. The Crowley soils are higher on the landscape than the Acadia soil and have an abrupt change in texture from the subsurface layer to the subsoil. The Gore soils are on steeper side slopes than the Acadia soil and have a subsoil that is reddish throughout. The Kaplan soils are in landscape positions similar to those of the Acadia soil and are more alkaline throughout. The Kinder soils are on broad flats and are grayish and loamy throughout. Included soils make up about 10 percent of the map unit.

This Acadia soil is low in fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to crops. Runoff is low. Water and air move through this soil at a very slow rate. A seasonal high water table is perched on the subsoil at a depth of 0.5 to 1.5 feet below the surface during December through April. The upper part of the subsoil remains wet during much of the winter and spring. The shrink-swell potential is high.

In most areas, this soil is used as woodland. A few areas are used as pasture or homesites.

This soil is moderately well suited to woodland. Wetness limits the use of equipment and causes severe plant competition. Using heavy equipment when the soil is moist can compact the soil and reduce its productivity. Harvesting only during dry periods reduces soil compaction. Reforestation after harvesting can be carefully managed to reduce competition from undesirable understory plants. Loblolly pine, slash pine, water oak, and cherrybark oak are suitable trees to plant.

This Acadia soil is moderately well suited to pasture. Wetness, low fertility, and the hazard of erosion are management concerns. The main pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, ryegrass, wild winter peas, and wheat. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture and soil in good condition. A seedbed should be prepared on the contour or across the slope where practical. Fertilizer and lime are needed for the optimum growth of grasses and legumes.

This soil is moderately well suited to cultivated crops. Wetness, potentially toxic levels of exchangeable aluminum, and the hazard of erosion are management concerns. Soybeans and rice are the main crops. The hazard of erosion can be reduced if fall grain is seeded early, stubble-mulch tillage is used, and tillage and seeding are on the contour or across the slope. The surface layer of this soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Returning all crop residue to the soil and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to maintain fertility and tilth. Most crops respond well to applications of fertilizer and lime which improve fertility and reduce the levels of exchangeable aluminum.

This soil is poorly suited to urban use. The main limitations are wetness, the very slow permeability, the high shrink-swell potential, and low strength on sites for local roads and streets. Drainage can improve the suitability of the soil for roads and buildings. The seasonal high water table and the very slow permeability increase the possibility that septic tank absorption fields will fail. Lagoons or self-contained sewage disposal units are suitable systems of sewage disposal. Preserving the existing plant cover during construction helps to control erosion. Mulching, applying fertilizer, and irrigating help to establish lawn grasses and other small-seeded plants. Designs for roads and streets can offset the limited ability of the soil to support a load. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential.

This Acadia soil is poorly suited to recreational development. Wetness and the very slow permeability are the main limitations. Drainage can improve the soil for most recreational uses.

This soil is well suited to use as habitat for openland and woodland wildlife, such as deer, squirrels, rabbits, dove, and quail. Habitat can be improved by selectively harvesting timber so that large den and mast-producing trees are left and by planting or encouraging suitable understory plants.

This Acadia soil is in capability subclass IIIe. The woodland ordination symbol is 9W.

AEA—Allemands muck. This organic soil is level, very poorly drained, and very fluid. It is in freshwater marshes and is ponded and flooded most of the time. The observations made were fewer than in most other areas because of poor accessibility. The detail in mapping, however, is adequate for the expected use of the soil. Slope is less than 1 percent.

Typically, the organic material is about 50 inches thick. It is dark brown, very fluid muck in the upper part; dark grayish brown, very fluid muck in the next part; and black, very fluid muck in the lower part. The next layer is black, very fluid mucky clay about 10 inches thick. The underlying mineral material to a depth of about 80 inches is gray, very fluid clay.

Included with this soil in mapping are a few small areas of Arat, Barbary, and Ged soils. The Arat and Barbary soils are in swamps and are very fluid mineral soils. Ged soils are in landscape positions similar to those of the Allemands soil. They are mineral soils and have a firm, clay subsoil. Included soils make up about 15 percent of the map unit.

This Allemands soil is ponded or flooded with several inches of fresh water most of the time. During storms, floodwater is as much as 2 feet deep. When the soil is not flooded, the high water table ranges from 1 foot above the surface to 0.5 foot below the surface. This soil has low strength and poor trafficability. Permeability is rapid in the organic surface layer and very slow in the clayey underlying material. The total subsidence potential is high. The shrink-swell potential is low because the soil is saturated and very fluid throughout. If the soil is drained, the shrink-swell potential of the underlying material is very high.

The natural vegetation consists mainly of bulltongue and maidencane. Other common plants are cattail, water primrose, alligatorweed, and pickerelweed.

Most areas of this soil are used as habitat for wetland wildlife or for extensive forms of recreation, such as hunting or fishing.

This soil is well suited to use as habitat for wetland wildlife. Roosting and feeding areas are available for ducks, geese, and many other species of waterfowl. This soil also provides habitat for crawfish, American alligators, and furbearers, such as nutria, muskrat, mink, and raccoons. Hunting of waterfowl is important in areas of this soil. The main management concern is controlling water levels. Habitat for wetland wildlife can be improved by constructing shallow ponds, by planting appropriate vegetation, or by promoting natural establishment of desirable plants.

This soil is not suited to crops, pasture, or woodland. Wetness, flooding, and low strength are too severe for these uses. The soil is generally too soft and boggy to support grazing livestock. Trees suitable for timber production generally do not grow on this soil. Drainage and protection from flooding are possible, but extensive water-control structures, such as levees and water pumps, are required. Extreme acidity, subsidence, and low strength are continuing limitations after drainage.

This Allemands soil is not suited to urban or intensive recreational uses. Wetness, flooding, and low strength are too severe for these uses. Drainage is feasible only with an extensive system of levees and water pumps. This soil is poorly suited to the construction of levees because it shrinks and cracks as it dries, causing the levees to fail.

This Allemands soil is in capability subclass VIIIw.

ARA—Arat mucky silt loam. This soil is level, very poorly drained, and very fluid. It is in swamps and is ponded and flooded most of the time. Areas are irregular in shape and several hundred acres in size. The observations made were fewer than in most other areas because of poor accessibility. The detail in mapping, however, is adequate for the expected use of the soils. Slope is less than 1 percent.

Typically, the surface layer is very dark grayish brown, very fluid mucky silt loam about 6 inches thick.

The underlying material extends to a depth of about 60 inches. It is dark grayish brown, very fluid silt loam in the upper part and dark grayish brown, very fluid silty clay loam in the lower part. The lower part contains logs and partially decomposed wood fragments.

Included with this soil in mapping are a few small areas of Allemands, Barbary, Basile, and Ged soils. The Allemands soils are in freshwater marshes and are organic soils. The Barbary and Ged soils are in landscape positions similar to those of the Arat soil and have a clayey subsoil or underlying material. The Basile soils are in higher positions and are friable or firm throughout. Included soils make up about 15 percent of the map unit.

This Arat soil is nearly continuously ponded or flooded. Floodwater ranges from 3 to 7 feet deep. When the soil is not flooded, the high water table ranges from 0.5 foot below the surface to 3 feet above the surface. The soil is saturated with water and is very fluid throughout. Permeability is slow. The total subsidence potential is medium.

The natural vegetation consists mainly of baldcypress and water tupelo trees. In places, most of the trees have been harvested and the vegetation consists of alligatorweed, water hyacinth, bulltongue, arrowhead, and pickerelweed. Natural regeneration of baldcypress and water tupelo is very slow.

Most areas of this soil are used as woodland and as habitat for wetland wildlife or for extensive forms of recreation, such as hunting and fishing.

This soil is poorly suited to woodland, mainly baldcypress and water tupelo. Regrowth of these trees is mainly on rotting logs, stumps, and root mats. Seedling mortality and the equipment limitation are severe because of ponding and flooding. Trafficability is very poor. Timber can be harvested only with the use of special equipment. This soil will not support the load of most harvesting equipment. Baldcypress is a suitable tree to plant.

This soil is well suited to use as wetland wildlife habitat (fig. 2). It provides roosting areas for migratory ducks and both food and nesting sites for wood ducks, squirrels, alligators, and many species of nongame birds. This soil also provides habitat for crawfish and furbearers, such as raccoons, nutria, and otters. Water-control structures that are designed to manage habitat are difficult to construct because of the instability and very fluid nature of the soil. Habitat can be improved by promoting the natural establishment of desirable plants.

This Arat soil is not suited to crops and pasture. Ponding, flooding, and low strength are too severe for these uses. The soil is too soft and boggy for grazing by livestock.

This soil is not suited to urban or intensive recreational uses. Ponding, flooding, and low strength are too severe for these uses. In addition, shallow excavation is very difficult because of buried logs and stumps.

This Arat soil is in capability subclass VIIIw. The woodland ordination symbol is 5W.

BBA—Barbary mucky clay. This level soil is very poorly drained and very fluid and slightly fluid. It is in swamps, is ponded most of the time, and is frequently flooded. Observations made were fewer than in most other areas because of poor accessibility. The detail in mapping, however, is adequate for the expected use of the soils. Slope is less than 1 percent.

Typically, the surface layer is dark grayish brown, slightly fluid mucky clay about 10 inches thick. The underlying material extends to a depth of 60 inches or more. It is dark gray, very fluid clay in the upper part and dark gray, slightly fluid clay in the lower part. Logs and fragments of wood are common in the lower part of the underlying material.

Included with this soil in mapping are a few small areas of Acadia, Arat, Basile, Gore, and Kaplan soils. The Acadia, Gore, and Kaplan soils are on terraces and are friable or firm throughout. Arat soils are in landscape positions similar to those of the Barbary soil and are loamy throughout. The Basile soils are on flood plains and are loamy and friable or firm throughout. Included soils make up about 15 percent of the map unit.

When this Barbary soil is flooded, the depth of floodwater ranges from 1 to 7 feet. When the soil is not flooded, the high water table fluctuates between a depth of 0.5 foot below the surface and 1 foot above the surface. This soil has low strength and a low shrink-swell potential. If the soil is drained, the shrink-swell potential is very high. Permeability is very slow. The total subsidence potential is medium.

The natural vegetation consists of baldcypress and water tupelo trees. Other common plants are red maple, alligatorweed, water hyacinth, lizard tail, and buttonbush.

This soil is mostly used as woodland and is also used as habitat for wetland wildlife.

This soil is poorly suited to woodland, mainly baldcypress, water tupelo, and black willow trees. The main management concerns are the severe equipment limitation and seedling mortality caused by wetness and flooding. Timber can be harvested only with the use of special equipment. This soil will not support the load of most harvesting equipment.

Figure 2.—This cypress-tupelo swamp is in an area of Arat mucky silt loam, a soil that provides habitat for wetland wildlife.

Natural regeneration of baldcypress and water tupelo is very slow. Regrowth of these trees is mainly on rotting logs, stumps, and root mats. A suitable tree to plant is baldcypress.

This Barbary soil is well suited to use as habitat for wetland wildlife. It provides roosting areas for migratory ducks and both food and nesting sites for wood ducks, squirrels, alligators, and nongame birds. This soil also provides suitable habitat for crawfish, and furbearers, such as raccoons, nutria, and otter. Habitat for wildlife can be improved by planting appropriate vegetation, by maintaining existing plant cover, or by promoting the natural establishment of desirable plants.

This soil is not suited to cultivated crops and pasture. Ponding, flooding, and low soil strength are generally too severe for these uses. The soil is too soft and boggy for grazing by livestock.

This soil is not suited to urban or intensive recreational uses. Ponding, flooding, and low soil strength are generally too severe for these uses. Also, shallow excavations are very difficult because of buried logs and stumps.

This Barbary soil is in capability subclass VIIw. The woodland ordination symbol is 4W.

BEA—Basile and Cascilla silt loams, frequently flooded. These level and very gently sloping soils are poorly drained and well drained and are on narrow flood plains. Most mapped areas contain both soils in varying proportions, but a few areas contain only one of the soils. In areas that contain both soils, the Basile soil is in low areas and in depressions, and the Cascilla soil is on low ridges or on natural levees that are mostly less than 100 feet wide. These soils are frequently flooded for brief to long periods. The Basile soil makes up about 50 percent of the map unit, and the Cascilla soil makes up about 30 percent. Areas range from 40 to 2,000 acres. The Basile soil has slopes dominantly less than 1 percent, and the Cascilla soil has slopes of 0 to 2 percent.

Frequent flooding is a hazard to the use and management of these soils. Because of this, separation of the soils is of little value to the land user. Observations made were fewer than in most other map units. The detail in mapping, however, is adequate for the expected use of the soils.

The Basile soil is level and poorly drained. Typically, it has a surface layer of grayish brown silt loam about 5 inches thick. The subsurface layer is light gray, mottled silt loam about 19 inches thick. It extends into the next layer. The subsoil, from a depth of 24 to 33 inches, is grayish brown, mottled silty clay loam that is mixed with light gray silt loam. To a depth of 96 inches, it is gray and grayish brown, mottled silty clay loam.

The Basile soil is low in fertility and has high levels of exchangeable aluminum that are potentially toxic to crops. In addition, it has high levels of sodium in the lower part of the subsoil. Water and air move through this soil at a slow rate. Runoff is very low. A seasonal high water table fluctuates between a depth of about 1.5 feet and the soil surface during December through May. This soil is frequently flooded for brief to long periods, mostly in winter and spring. Depth of the floodwaters ranges from 1 to 8 feet. The shrink-swell potential is moderate in the subsoil.

The Cascilla soil is level or very gently sloping and well drained. Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil extends to a depth of 80 inches. It is brown silt loam in the upper part; brown, mottled silt loam in the next part; and brown and yellowish brown, mottled silty clay loam in the lower part.

The Cascilla soil is low in fertility and has high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderate rate. Runoff is low. This soil is frequently flooded for brief to long periods, mostly in winter and spring. Depth of the floodwaters ranges from 1 to 8 feet. The surface layer of this soil dries quickly after rains. The shrink-swell potential is low.

Included with these soils in mapping are a few small areas of Arat, Barbary, Bienville, and Guyton soils. The very poorly drained Arat and Barbary soils are in swamps and are slightly fluid or very fluid throughout. Bienville soils are on low terraces and are sandy throughout. Guyton soils are in landscape positions similar to those of the Basile soil, and they are acid throughout. The included soils make up about 20 percent of the map unit.

Most areas of these Basile and Cascilla soils are used as woodland. A small acreage is used for pasture.

These soils are moderately well suited to woodland. The Basile soil is suited to hardwoods, and the Cascilla soil is suited to both pine and hardwoods. Wetness limits the use of equipment, and flooding causes severe seedling mortality. Competition from understory plants is moderate. Trees should be water-tolerant, and they should be planted or harvested during dry periods to reduce rutting and soil compaction. Conventional methods of harvesting timber can be used, but use of equipment may be limited during the rainy period, which is generally from December to May. Competing vegetation can be controlled by proper site preparation. Spraying, cutting, or girdling eliminates unwanted weeds, brush, and trees. Suitable trees to plant on the Basile soil are green ash and overcup oak. Trees to plant on the Cascilla soil are loblolly pine, cherrybark oak, nuttall oak, and sweetgum.

These soils are poorly suited to pasture. Pasture establishment is difficult because of wetness and the flood hazard. Wetness limits the choice of plants and the period of grazing. Low fertility is an additional soil limitation. The main pasture plant is common bermudagrass. Native grasses also are suited to these soils. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. It is generally not practical to apply high rates of fertilizer or lime because of the hazard of overflow.

The soils in this map unit generally are poorly suited to cultivated crops. The hazard of flooding is too severe for this use.

These soils are moderately well suited to use as habitat for openland wildlife. The Basile soil is well suited to use as habitat for wetland wildlife. The Cascilla soil is well suited to use as habitat for woodland wildlife. Habitat can be improved by selectively harvesting timber so that large den and mast-producing trees are left, by planting or promoting desirable understory plants, and by establishing food plots in small openings in woodland.

These soils are not suited to urban development. Wetness and flooding are generally too severe.

The soils in this map unit are poorly suited to sites for recreation areas. The main hazard is flooding, and the main limitation is wetness. Picnic areas and paths and trails can be developed, but their use is limited to dry periods.

These Basile and Cascilla soils are in capability subclass Vw. The woodland ordination symbol is 4W in areas of the Basile soil and 14W in areas of the Cascilla soil.

BhB—Bienville loamy fine sand, 1 to 3 percent slopes. This soil is very gently sloping and somewhat excessively drained. It is on low ridges on terraces. Areas are irregular in shape and range from 15 to 80 acres.

Typically, the surface layer is brown loamy fine sand about 4 inches thick. The subsurface layer is yellowish brown loamy fine sand about 8 inches thick. The subsoil to a depth of about 68 inches is yellowish brown loamy fine sand in the upper part and strong brown fine sandy loam in the lower part.

Included with this soil in mapping are a few small areas of Cahaba, Guyton, and Kinder soils. All of these soils are loamy throughout. The Cahaba soils are slightly lower on the landscape than the Bienville soil, and the Guyton soils are in lower positions. The Kinder soils are on adjacent terraces at a higher elevation than the Bienville soil. The included soils make up about 10 percent of the map unit.

This Bienville soil is low in fertility. Water and air move through this soil at a moderately rapid rate. Runoff is low. A seasonal high water table is at a depth of 4 to 6 feet during December through April. Plants are damaged from a lack of water during dry periods in the summer and fall of most years. This soil dries quickly after heavy rain. The shrink-swell potential is low.

This soil is mostly used as pine woodland. In a few areas, it is used as pasture, cropland, or homesites.

This soil is moderately well suited to woodland. Trafficability can be a problem when this sandy soil is dry. Seedling mortality is moderate because of droughtiness and the damage caused by the Texas leaf-cutting ant, which is especially well adapted to this soil. Suitable trees to plant are loblolly pine and slash pine.

This Bienville soil is moderately well suited to pasture. Droughtiness and low fertility are the main limitations. Suitable pasture plants are improved bermudagrass, weeping lovegrass, crimson clover, bahiagrass, and ryegrass. Pasture is difficult to establish because of droughtiness. Proper grazing practices, weed control, and applications of fertilizer are needed for maximum quality of forage.

This soil is moderately well suited to most cultivated crops, including some truck and garden crops. Droughtiness and low fertility are the main limitations. The main crops are soybeans, corn, and locally adapted truck and garden crops. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range of moisture content. Erosion can be a problem when the soil is left bare. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. All tillage should be on the contour or across the slope. Most crops and pasture plants respond well to additions of lime and fertilizer. Where water of suitable quality is available, irrigating can improve crop growth.

This soil is moderately well suited to urban development. Seasonal wetness and the moderately rapid permeability are the main limitations. Cutbanks cave easily, making shallow excavations difficult. Because of the high water table, septic tank absorption fields do not function properly during rainy periods. If the density of housing is moderate to high, community sewage systems are needed to prevent contamination of water supplies as a result of seepage. Lawn grasses can require irrigation because of soil droughtiness.

This Bienville soil is moderately well suited to recreational uses such as playgrounds and picnic areas. The main limitation is the sandy surface layer. A vegetative cover can be somewhat difficult to establish and maintain because of soil droughtiness.

This soil is moderately well suited to use as habitat for woodland and openland wildlife. Habitat for woodland wildlife can be improved by selectively harvesting timber so that the large den and mast-producing trees are left, by promoting desirable understory plants, and by planting food plots in small woodland openings.

This Bienville soil is in capability subclass IIs. The woodland ordination symbol is 10S.

BnB—Bienville-Guyton complex, gently undulating. These soils are somewhat excessively drained and poorly drained. They are on low parallel ridges and in swales on terraces. The somewhat excessively drained Bienville soil is on low ridges, and the poorly drained Guyton soil is in swales. The Guyton soil is subject to rare flooding. The mapped areas range from about 40 to 1,500 acres and are about 55 percent Bienville soil and 35 percent Guyton soil. The soils in this map unit are so intricately mixed that it is not practical to map them separately at the scale used. The Bienville soil has slopes that range from 1 to 3 percent. Slope is less than 1 percent in areas of the Guyton soil.

Typically, the Bienville soil has a surface layer of dark yellowish brown loamy fine sand about 4 inches thick. The subsurface layer is yellowish brown loamy fine sand about 10 inches thick. The upper part of the subsoil, from a depth of 14 to 29 inches is strong brown loamy fine sand that is mixed with very pale brown sand. The lower part of the subsoil, to a depth of 62 inches, is strong brown loamy fine sand.

This soil is low in fertility. Water and air move through this soil at a moderately rapid rate. Runoff is low. A seasonal high water table is at a depth of 4 to 6 feet during December through April. Plants are damaged from a lack of water during dry periods in the summer and fall of most years. This soil dries quickly after heavy rain. The shrink-swell potential is low.

Typically, the Guyton soil has a surface layer of grayish brown silt loam about 4 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 12 inches thick. It extends into the next layer. The upper part of the subsoil, from a depth of 16 to 30 inches, is grayish brown silty clay loam and light brownish gray, mottled silt loam. The lower part of the subsoil, to a depth of 60 inches, is grayish brown, mottled silty clay loam.

This soil is low in fertility and high in exchangeable aluminum levels that are potentially toxic to crops. Water and air move through this soil at a slow rate. Runoff is low, and water stands in swales for short periods after heavy rain. A seasonal high water table fluctuates between a depth of about 1.5 feet and the soil surface during December through May. Poor aeration and wetness restrict the root development of many plants. This soil dries out more slowly than the adjoining soils that are in higher positions. It is subject to rare flooding for brief periods mostly in the winter and spring.

Included in this map unit are a few small areas of Acadia, Caddo, Cahaba, Gore, Kinder, and Messer soils. All of these soils, except the Cahaba soils, are at higher elevations on nearby terraces. The Cahaba soils are slightly lower on the landscape than the Bienville soil. The Acadia and Gore soils have a clayey and loamy subsoil. The Caddo and Kinder soils are similar to the Guyton soil, except that they have reddish mottles in the subsoil. The Cahaba soils contain more clay in the subsoil than the Bienville soil. The Messer soils are moderately well drained. Also included are a few small areas of frequently flooded Guyton soils in deep swales and channel scars. The included soils make up about 10 percent of the map unit.

Most areas of this complex are used as woodland. A few areas are used as pasture, cropland, or homesites.

The soils in this map unit are moderately well suited to woodland. The main management concerns in producing and harvesting timber in areas of the Guyton soil are severe equipment limitations, the risk of soil compaction, and moderate seedling mortality caused by wetness. In addition, competition from unwanted plants is severe. The Bienville soil has moderate seedling mortality because of droughtiness. Trafficability is poor in areas of the Bienville soil when the sandy surface layer is dry. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Harvesting only during dry periods can reduce soil compaction and maintain the productivity of the Guyton soil. Suitable trees to plant are loblolly pine and slash pine. Also, water oak, cherrybark oak, and green ash can be planted on the Guyton soil.

The soils in this complex are moderately well suited to pasture. Wetness is a limitation in areas of the Guyton soil, and droughtiness is a limitation in areas of the Bienville soil (fig. 3). Both of these soils have low fertility. The main pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. Weeping lovegrass also can be grown on the Bienville soil. Proper grazing practices, weed control, and additions of lime and fertilizer are needed for maximum quality forage.

These soils are moderately well suited to cultivated crops. Wetness is a limitation in areas of the Guyton soil, and the sandy Bienville soil is droughty. In addition, the Guyton soil contains potentially toxic levels of exchangeable aluminum in the root zone. Low fertility and the hazard of erosion are management concerns for both soils. Truck crops are the main crops grown. Artificial drainage can improve the Guyton soil for crops. Returning all crop residue to the soil and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to control erosion and maintain fertility and tilth. Crops respond to additions of lime and fertilizer, which improve fertility and reduce the level of exchangeable aluminum.

The Bienville soil in this complex is moderately well suited to urban development, and the Guyton soil is poorly suited. Wetness is the main limitation. Flooding is a hazard in areas of the Guyton soil. Droughtiness is a limitation to lawn establishment in areas of the Bienville soil. Wetness in both soils and slow permeability in the Guyton soil increase the possibility that septic tank absorption fields will fail. Where the density of houses is moderate or high, community sewage systems are needed to prevent contamination of water supplies by seepage of effluent. If homes are constructed in areas of the Guyton soil, drainage and protection from flooding should be provided. Buildings can be constructed on

Figure 3.—Improved pasture in an area of Bienville-Guyton complex, gently undulating. These soils are moderately well suited to pasture. Droughtiness limits forage production on the Bienville soil, and wetness is a limitation in areas of the Guyton soil, the dark area in the photo.

pilings or mounds to elevate them above the expected flood level. Low strength is a limitation on the Guyton soil on sites for local roads and streets. This limitation can be overcome by strengthening the road base with sandy material. Because cutbanks cave easily in areas of the Bienville soil, shallow excavations are difficult.

These soils are moderately well suited to recreational development. The sandy texture and droughtiness of the Bienville soil and the wetness limitation and flooding hazard of the Guyton soil are management concerns. Drainage can improve the Guyton soil for intensively used areas such as playgrounds and camp areas. Plant cover can be maintained by applying fertilizer and controlling traffic. Irrigating the Bienville soil will also ensure good plant growth.

The soils in this complex are moderately well suited to use as habitat for woodland and openland wildlife. The Guyton soil also is well suited to use as habitat for wetland wildlife. Habitat for woodland wildlife can be improved by encouraging the growth of oaks and other mast-producing trees, by planting or promoting desirable understory plants, and by planting food plots in small woodland openings. Habitat for openland wildlife can be improved by providing field borders, planting crops in narrow strips, and planting a diversity of crops in rotation. Constructing shallow ponds can improve the Guyton soil for wetland wildlife habitat.

The Bienville soil in this complex is in capability subclass IIs and the Guyton soil is in IIIw. The woodland ordination symbol is 10S in areas of the Bienville soil and 8W in areas of the Guyton soil.

CdA—Caddo-Messer silt loams. These level and gently sloping soils are poorly drained and moderately well drained. They are on broad flats on terraces of the Gulf Coast Prairies. This complex consists of small areas of Caddo and Messer soils that are so intermingled that they cannot be mapped separately at the scale selected. Areas are irregular in shape and range from 30 to 1,500 acres. The landscape consists of a broad flat that contains many, small convex mounds. The mounds are generally circular and range from 30 to 150 feet across and from 1 to 6 feet high. Some mounds have been smoothed. The mapped areas are about 60 percent Caddo soil and about 30 percent Messer soil. The Caddo soil is in the intermound areas, and the Messer soil is on mounds or smoothed mound areas. Slope is less than 1 percent in the intermound areas and ranges from about 1 to 5 percent on the mounds. Where mounds have been smoothed, slopes are 0 to 1 percent.

The Caddo soil is level and poorly drained. Typically, it has a surface layer of dark grayish brown silt loam about 6 inches thick. The subsurface layer is about 15 inches thick. It is grayish brown and light brownish gray, mottled silt loam. The subsurface layer extends into the next layer. The subsoil, from a depth of 21 to 38 inches, is gray, mottled silty clay loam that is mixed with light brownish gray and light gray silt loam; from a depth of 38 to 47 inches, it is gray, mottled silty clay loam; and from a depth of 47 to 68 inches it is grayish brown, mottled silty clay loam.

This soil has low natural fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Runoff is low, and water stands in depressions for short periods after heavy rain. A seasonal high water table fluctuates between a depth of 2 feet and the soil surface during December through April. The shrink-swell potential is low.

The Messer soil is level or gently sloping and moderately well drained. Typically, it has a surface layer of grayish brown silt loam about 4 inches thick. The subsurface layer is yellowish brown silt loam about 4 inches thick. The subsoil, to a depth of 30 inches, is yellowish brown silt loam grading to light yellowish brown, mottled silty clay loam. From a depth of 30 to 40 inches, the subsoil is pale brown silty clay loam that is mixed with light gray silt loam. The lower part of the subsoil, to a depth of 72 inches, is brown, mottled silty clay loam.

This soil has low natural fertility and high levels of exchangeable aluminum that are potentially toxic to most crops. Water and air move through this soil at a slow rate, and water runs off the surface at a medium rate. A seasonal high water table is at a depth of 2 to 4 feet during December through May. Where mounds have been mechanically smoothed, runoff is low, and the seasonal high water table fluctuates between near the surface and 2 feet below the surface. Plant roots penetrate this soil easily. The shrink-swell potential is low.

Included in mapping are a few small areas of Glenmora and Guyton soils. The Glenmora soils are mainly on side slopes and are similar to the Messer soil, except that they contain more clay in the subsoil. The Guyton soils are slightly lower on the landscape than the Caddo soil and are similar to the Caddo soil, except that they do not have red mottles in the subsoil. The included soils make up about 10 percent of the map unit.

Areas of this complex are used about equally as woodland and cropland. A few areas are used as pasture or homesites.

The soils in this map unit are moderately well suited to cultivated crops. Wetness, low fertility, and potentially toxic levels of exchangeable aluminum within the root zone are the main limitations. Erosion is a hazard in areas of the Messer soil. The small mounds interfere with cultivation. Soybeans and rice are the main crops. Drainage can improve the Caddo soil for most crops. Land grading and smoothing can improve surface drainage and permit more efficient use of farm equipment. The surface layer of the soils is easy to work and to keep in good tilth, but a crust can form when clean tilled. The organic matter content can be maintained and surface crusting and erosion can be reduced by using all crop residue, plowing under cover crops, and using a suitable cropping system. Most crops and pasture plants respond well to additions of fertilizer and lime, which are designed to overcome the low fertility and high levels of exchangeable aluminum.

The soils in this complex are moderately well suited to woodland. Wetness limits the use of equipment on both the Caddo and Messer soils and increases the risk of rutting and soil compaction. Wetness also causes moderate seedling mortality in areas of the Caddo soil. Competition from unwanted understory plants is moderate or severe. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Improving surface drainage or using special site preparation, such as harrowing and bedding, will help in establishing seedlings, reducing seedling mortality, and increasing early seedling growth. Harvesting only during dry periods can reduce rutting and soil compaction. Suitable trees to plant are loblolly pine, slash pine, water oak, cherrybark oak, and green ash.

These soils are moderately well suited to pasture. Low fertility and wetness are the main limitations.

Erosion is a hazard in areas of the Messer soil. The main pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, white clover, wild winter peas, and ryegrass. Grazing when the soil is wet compacts the surface layer. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture and soil in good condition. Fertilizer and lime are needed for optimum growth of grasses and legumes.

The Caddo soil in this map unit is poorly suited to urban development. The Messer soil is moderately well suited. The main limitations are wetness, the slow permeability, and low strength on sites for local roads and streets. Excess water can be removed by using shallow ditches and providing the proper grade. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. The design of roads can offset the limited ability of the soils to support a load.

The Caddo soil in this complex is poorly suited to recreational development, and the Messer soil is moderately well suited. The main limitation is wetness. Slope increases the hazard of erosion in areas of the Messer soil. Drainage can improve these soils for intensively used areas such as playgrounds. Maintaining an adequate plant cover helps to control erosion. The plant cover can be maintained by applying fertilizer and controlling traffic.

The soils in this complex are well suited to use as habitat for woodland wildlife. The Caddo soil is well suited to use as habitat for wetland wildlife, and the Messer soil is poorly suited to this use. The Caddo soil is moderately well suited to use as habitat for openland wildlife, and the Messer soil is well suited to this use. Habitat for woodland wildlife can be improved by selectively harvesting timber so that large den and mast-producing trees are left, by planting desirable understory plants, and by promoting the natural establishment of desirable plants along field borders. Shallow ponds can be constructed in areas of the Caddo soil to improve the habitat for waterfowl and furbearers. Providing field borders and leaving odd areas of grain near good wildlife cover improve the habitat for rabbits, doves, quail, and nongame birds and animals.

The Caddo soils are in capability subclass IIIw, and the Messer soils are in IIIe. The woodland ordination symbol is 10W for both soils.

ChB—Cahaba fine sandy loam, 1 to 3 percent slopes. This soil is very gently sloping and well drained. It is on ridges on terraces. Areas are irregular in shape and range from 20 to 100 acres.

Typically, the surface layer is dark grayish brown and brown fine sandy loam about 8 inches thick. The subsurface layer is light yellowish brown fine sandy loam about 10 inches thick. The upper part of the subsoil, from a depth of 18 to 25 inches, is yellowish red fine sandy loam that is mixed with light yellowish brown fine sandy loam. The lower part of the subsoil, to a depth of 60 inches, is yellowish red, mottled loam. The underlying material is strong brown, mottled loamy sand to a depth of 81 inches.

Included in mapping are a few small areas of Bienville, Guyton, and Kinder soils. The Bienville soils are slightly higher on the landscape than the Cahaba soil and are sandy throughout. The Guyton soils are in lower positions and are grayish throughout. The Kinder soils are on nearby terraces at higher elevations and are grayish throughout. The included soils make up about 10 percent of the map unit.

This soil is low in fertility and has high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderate rate. Runoff is medium. Plants are damaged by lack of water during dry periods in the summer and fall of some years. Plant roots penetrate this soil easily. This soil dries quickly after rains. The shrink-swell potential is low.

Most areas of this soil are used as woodland. A few areas are used as pasture, cropland, or homesites.

This soil is well suited to woodland and has few limitations to the production and harvest of timber. However, competition from unwanted understory plants is moderate. These plants can be controlled with adequate site preparation and by spraying or using controlled burning. Suitable trees to plant are loblolly pine, slash pine, sweetgum, and water oak.

This Cahaba soil is well suited to pasture. Low fertility and the moderate available water capacity are the main limitations. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, and crimson clover. Proper grazing, weed control, and fertilizer are needed for maximum quality of forage.

This soil is well suited to cultivated crops. Erosion is a hazard, and the main limitations are low fertility and potentially toxic levels of exchangeable aluminum within the root zone. The main crops are corn, soybeans, wheat, and truck and garden crops (fig. 4). This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Crop residue left on or near the

Figure 4.—Winter wheat in an area of Cahaba fine sandy loam, 1 to 3 percent slopes, a soil that is well suited to crops.

surface helps to conserve moisture, maintain tilth, and control erosion. Farming on the contour also helps to control erosion. Crops respond well to additions of lime and fertilizer, which improve fertility and reduce the levels of exchangeable aluminum.

This Cahaba soil is well suited to recreational and urban development. Few limitations affect these uses. However, cutbanks cave easily, making shallow excavations difficult. Slope is a moderate limitation to sites for playgrounds. Runoff and erosion can be controlled by maintaining a plant cover.

This soil is well suited to use as habitat for openland and woodland wildlife. Habitat for woodland wildlife can be improved by selectively harvesting timber so that large den and mast-producing trees are left, by planting or promoting desirable understory plants, and by planting food plots in small woodland openings. Habitat for openland wildlife species, such as rabbits, quail, doves, and nongame birds, can be improved by planting crops in narrow strips and using a greater diversity of crops in rotation.

This Cahaba soil is in capability subclass IIe. The woodland ordination symbol is 9A.

CrA—Crowley-Vidrine silt loams, 0 to 1 percent slopes. These level soils are moderately well drained and somewhat poorly drained. They are on broad convex ridges on terraces of the Gulf Coast Prairies. This complex consists of small areas of Crowley and Vidrine soils that are so intermingled that they cannot be mapped separately at the scale selected. Areas are irregular in shape and range from 20 to 2,500 acres. The landscape consists of broad convex ridges that contain many small convex mounds or mound areas that have been smoothed. The mounds are circular and range from 50 to 150 feet across and

1 to 6 feet high before being leveled. Most mounds have been leveled. The Crowley soil makes up about 55 percent of the areas mapped, and the Vidrine soil about 35 percent. The Crowley soil is in the intermound areas, and the Vidrine soil is on the mounds or smoothed mound areas.

This Crowley soil is somewhat poorly drained. Typically, the surface layer is 13 inches thick. It is dark grayish brown silt loam that has brownish mottles in the lower part. The subsurface layer is grayish brown, mottled silt loam about 4 inches thick. From a depth of 17 to 40 inches, the subsoil is grayish brown, mottled silty clay; from a depth of 40 to 48 inches, it is light brownish gray, mottled clay loam; from a depth of 48 to 61 inches, it is grayish brown, mottled clay loam; and from a depth of 61 to 73 inches, it is light brownish gray, mottled clay loam.

This soil has medium fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a very slow rate. Runoff is very low. The surface layer of this soil remains wet for long periods after heavy rain. A seasonal high water table is perched on the subsoil and fluctuates between depths of 0.5 foot and 1.5 feet from December through April. This soil has a high shrink-swell potential.

This Vidrine soil is moderately well drained and somewhat poorly drained. Typically, it has a surface layer of dark grayish brown silt loam about 6 inches thick. From a depth of 6 to 14 inches, the subsoil is brown silt loam; from a depth of 14 to 18 inches, it is grayish brown, mottled silty clay that is mixed with pale brown silt loam; from a depth of 18 to 46 inches, it is grayish brown, mottled silty clay; from a depth of 46 to 70 inches, it is light brownish gray, mottled silty clay that grades to silty clay loam. In places, the slope ranges from 1 to 3 percent.

This soil has medium fertility. Water and air move through this soil at a slow rate. Runoff is medium. A seasonal high water table is perched on the subsoil at a depth of 1 to 2 feet below the surface during December through April. Where the mounds have been smoothed, runoff is low, and the seasonal high water table fluctuates between depths near the surface and 1 foot below the surface. The shrink-swell potential is high.

Included in this map unit are a few small areas of Kaplan, Leton, Morey, and Mowata soils. The Kaplan soils are slightly lower on the landscape than the Crowley and Vidrine soils and are alkaline in the middle and lower parts of the subsoil. The Leton, Morey, and Mowata soils are lower on the landscape than the Crowley and Vidrine soils. The Leton and Morey soils are loamy throughout. The Mowata soils have a subsurface layer that extends into the subsoil. The included soils make up about 10 percent of the map unit.

The soils of this map unit are mainly used as cropland. A few areas are used as pasture, woodland, or homesites.

The soils in this map unit are moderately well suited to cultivated crops, mainly rice, wheat, and soybeans (fig. 5). The main limitations are wetness and moderately high levels of exchangeable aluminum within the root zone. Most climatically adapted crops can be grown if artificial drainage is provided. These soils are friable and easily tilled throughout a wide range in moisture content. The surface, however, crusts after heavy rainfall. A tillage pan can form as a result of excessive cultivation, but this pan can be broken by subsoiling when the soil is dry. Land grading and smoothing improve surface drainage and permit more efficient use of farm equipment. The organic matter content can be maintained by using all crop residue, plowing under cover crops, and using a suitable cropping system. Most crops respond well to additions of fertilizer and lime, which improve fertility and reduce levels of exchangeable aluminum.

These soils are well suited to pasture. The main limitation is wetness. Medium fertility is a minor limitation. The main pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, wild winter peas, and white clover. Grazing when the soil is wet compacts the surface layer and causes poor tilth and excessive runoff. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed for optimum growth of grasses and legumes.

The soils in this map unit are moderately well suited to woodland. Wetness severely limits the use of equipment and causes slight to moderate seedling mortality. These soils may be compacted if it is wet when heavy equipment is used. This can be overcome by using specialized equipment or by logging during drier periods. Competition from understory plants is severe. Reforestation after harvest can be carefully managed to reduce competition from undesirable understory plants. Suitable trees to plant are loblolly pine, slash pine, water oak, and green ash.

These soils are poorly suited to urban development (fig. 6). The main limitations are wetness, the slow or very slow permeability, the high shrink-swell potential, and low strength on sites for local roads and streets. Drainage can improve the soils for growing lawn grasses, shade trees,

Figure 5.—Winter wheat in an area of Crowley-Vidrine silt loams, 0 to 1 percent slopes. Wetness and moderately high levels of exchangeable aluminum are the main limitations for growing crops on these soils.

ornamental trees, shrubs, vines, and vegetable gardens. Designs for roads can offset the limited ability of the soils in this map unit to support a load. The slow and very slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. Lagoons or self-contained disposal units can be used to dispose of sewage properly. The effects of shrinking and swelling can be minimized by proper design and by backfilling with material that has a low shrink-swell potential.

The soils in this map unit are poorly suited to recreational development. The main limitations are wetness and the slow or very slow permeability. Providing artificial drainage can improve these soils for intensively used areas such as playgrounds. Cuts and fills should be seeded or mulched. Plant cover can be maintained by controlling traffic.

The Crowley soils in this complex are moderately well suited to use as habitat for openland wildlife, such as doves, quail, and rabbits; and for woodland wildlife, such as deer, squirrels, rabbits, quail, fox, and songbirds. The Vidrine soils are well suited to these uses. The Crowley soil is well suited to use as habitat for wetland wildlife, and the Vidrine soil is moderately well suited to this use. Habitat for all kinds of wildlife can be improved by planting appropriate vegetation, by maintaining existing plant cover, or by promoting the natural establishment of desirable plants. Selectively harvesting trees so that large den and mast-producing trees are left improves the habitat for woodland wildlife.

The soils in this map unit are in capability subclass IIIw. The woodland ordination symbol is 11W for the Crowley soil and 9W for the Vidrine soil.

CrB—Crowley-Vidrine silt loams, 1 to 3 percent slopes. These gently sloping soils are somewhat poorly drained to moderately well drained. They are on the side slopes of broad convex ridges on terraces

Figure 6.—This home is in an area of Crowley-Vidrine silt loams, 0 to 1 percent slopes. The area of Leton silt loam, in the foreground, is subject to rare flooding.

of the Gulf Coast Prairies. This complex consists of small areas of Crowley and Vidrine soils that are so intermingled that they cannot be mapped separately at the scale selected. Areas are long and narrow and range from 20 to 200 acres. The landscape consists of narrow side slopes that contain many small convex mounds or mound areas that have been smoothed. The mounds are circular and range from 50 to 150 feet across and 1 to 6 feet high before leveling. The Crowley soil makes up about 55 percent of the areas mapped and the Vidrine soil about 35 percent. The Crowley soil is in the intermound areas, and the Vidrine soil is on the mounds or smoothed mound areas.

The Crowley soil is somewhat poorly drained. Typically, it has a surface layer of dark grayish brown silt loam about 10 inches thick. The subsurface layer is grayish brown, mottled silt loam about 9 inches thick. The subsoil extends to a depth of about 62 inches. It is grayish brown, mottled silty clay in the upper part; light brownish gray, mottled silty clay in the next part; and gray, mottled silty clay loam in the lower part.

The Crowley soil has medium fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a very slow rate. Runoff is medium. The surface layer of this soil remains wet for long periods after heavy rain. A seasonal high water table is perched on the subsoil at a depth of about 0.5 foot to 1.5 feet during December through April. This soil has a high shrink-swell potential.

The Vidrine soil is moderately well drained and somewhat poorly drained. Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. From a depth of 6 to 18 inches, the subsoil is yellowish brown, mottled silt loam; from a depth of 18 to 22 inches, it is light brownish gray silty clay that is mixed with brown, mottled silt loam; and from a depth of 22 to 64 inches, it is gray, mottled silty clay.

The Vidrine soil has medium fertility. Water and air move through this soil at a slow rate. Runoff is medium. A seasonal high water table is perched on the subsoil at a depth of 1 to 2 feet below the surface during December through April. Where mounds have been smoothed, runoff is low, and the seasonal high water table fluctuates between near the surface and 1 foot below the surface. The shrink-swell potential is high.

Included in this map unit are a few small areas of Kaplan, Leton, Mowata, and Pineisland soils. The Kaplan soils are slightly lower on the landscape than the Crowley and Vidrine soils and are alkaline in the middle and lower parts of the subsoil. The Leton and Mowata soils are lower on the landscape than the Crowley and Vidrine soils. The Leton soils are loamy throughout. The Mowata soils have a subsurface layer that extends into the subsoil. The Pineisland soils are on ridges and are loamy throughout. The included soils make up about 10 percent of the map unit.

The soils of this map unit are mainly used as cropland. A few areas are used as pasture, woodland, or homesites.

The soils in this map unit are moderately well suited to cultivated crops, mainly rice and soybeans. Erosion is the main hazard. Wetness, medium fertility, and potentially toxic levels of aluminum in the root zone are the main limitations. These soils are friable and easy to keep in good tilth. The plow layers can be worked throughout a wide range in moisture content. A tillage pan can form as a result of excessive cultivation, but this pan can be broken by subsoiling when the soil is dry. Maintaining crop residue on or near the surface helps to control runoff and to maintain soil tilth and organic matter content. The hazard of erosion can be reduced if fall grain is seeded early, stubble-mulch tillage is used, and tillage and seeding are done on the contour or across the slope. Also, waterways can be shaped and seeded to perennial grass. Excess water can be removed with shallow ditches and suitable outlets. Most crops respond well to applications of fertilizer and lime, which improve fertility and reduce the level of exchangeable aluminum.

These soils are moderately well suited to pasture. Erosion is a hazard. Wetness and medium fertility are limitations to this use. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, white clover, wild winter peas, and vetch. A seedbed should be prepared on the contour or across the slope where practical. Grazing when the soil is wet compacts the surface layer and causes poor tilth and excessive runoff. Proper grazing, weed control, fertilizer, and lime are needed for maximum quality of forage.

The soils in this map unit are moderately well suited to woodland. The main concern in producing and harvesting timber is wetness, which severely limits the use of equipment, increases the risk of soil compaction, and causes slight or moderate seedling mortality. Competition from unwanted understory plants is severe. Reforestation after harvesting can be carefully managed to reduce competition from undesirable understory plants. Soil compaction can be reduced by using suitable logging systems, laying out skid trails in advance, and harvesting timber when the soil is least susceptible to compaction. Suitable trees to plant are loblolly pine, slash pine, water oak, and cherrybark oak.

The soils in this map unit are poorly suited to urban development. The main limitations are wetness, the slow or very slow permeability, the high shrink-swell potential, and low strength on sites for local roads and streets. Septic tank absorption fields do not function properly during rainy periods because of wetness and the slow or very slow permeability. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. Buildings and roads can be designed to offset the effects of shrinking and swelling.

These soils are poorly suited to recreational development. The main limitations are wetness and the slow or very slow permeability. Excess water can be removed by shallow ditches and by providing the proper grade. Cuts and fills should be seeded or mulched. Plant cover can be maintained by controlling traffic.

The Crowley soils in this complex are moderately well suited to use as habitat for wetland, openland, and woodland wildlife. The Vidrine soils are well suited to use as habitat for openland and woodland wildlife and moderately well suited to use as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining existing plant cover, or by promoting the natural establishment of desirable plants. Crop residue or stubble from crops can be left on the surface over winter to provide food and cover for rabbits, doves, quail, and nongame birds and animals.

The soils in this map unit are in capability subclass IIIe. The woodland ordination symbol is 11W for the Crowley soil and 9W for the Vidrine soil.

GDA—Ged clay. This soil is level and very poorly drained. It is in freshwater marshes and is ponded most of the time and frequently flooded. Observations made were fewer than in most other areas because of poor accessibility. The detail in mapping, however,

Figure 7.—Cattail, maidencane, and softstem rush are the dominant plants in an area of Ged clay.

is adequate for the expected use of the soil. Slope is less than 1 percent.

Typically, the surface layer is dark gray, very fluid clay about 8 inches thick. The next layer is very dark gray, slightly fluid clay about 8 inches thick. The subsoil extends to about 62 inches. It is dark gray, mottled clay in the upper part and gray, mottled silty clay in the middle and lower parts.

Included with this soil in mapping are a few small areas of Allemands, Arat, Basile, and Judice soils. The Allemands soils are in landscape positions similar to those of the Ged soil and have an organic layer more than 16 inches thick. The Arat soils are in swamps and are very fluid throughout. The Basile soils are on flood plains and are loamy throughout. The Judice soils are on terraces and are friable or firm throughout. Included soils make up about 20 percent of the map unit.

The Ged soil is ponded most of the time and subject to frequent flooding. During storms, floodwater is as much as 3 feet deep. When the soil is not flooded, the high water table fluctuates between the soil surface and 1 foot above the surface. The permeability is very slow. This marsh soil is firm enough to support livestock grazing. The shrink-swell potential is high.

The natural vegetation consists mainly of maidencane, cattail, bulltongue, softstem rush, and alligatorweed (fig. 7). Other common plants are button bush, willow trees, lotus, California bulrush, squarestem spikesedge, paspalum, jamaica sawgrass, and giant cutgrass.

This soil is used mainly as habitat for wetland wildlife and for extensive forms of recreation. A small acreage is used as rangeland.

This soil is well suited to use as habitat for wetland wildlife. Ducks, geese, and many other types of waterfowl feed and roost in areas of this soil. This soil also provides habitat for the American alligator and furbearers, such as nutria, muskrat, mink, and raccoons. Hunting of waterfowl is a popular sport. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers. It can also be improved by planting appropriate vegetation or by promoting the natural establishment of desirable plants.

This Ged soil is moderately well suited to rangeland. The major concerns on marsh rangeland are flooding and wildfires. During flood periods, cattle can be moved to adjacent pastures and to higher elevations.

Unless drained and protected from flooding, these soils are not suited to cropland, pasture, or woodland. If water control is maintained with a system of dikes, ditches, and water pumps, this soil can be used to grow rice.

This soil is not suited to urban uses or intensive forms of recreation. Wetness, the very slow permeability, low strength on sites for local roads and streets, and the high shrink-swell potential are the main limitations. Flooding is a hazard.

This Ged soil is in capability subclass VIIw.

GnB—Glenmora silt loam, 1 to 3 percent slopes. This soil is very gently sloping and moderately well drained. It is on ridgetops and side slopes on terraces. Areas are irregular in shape and range from 10 to 800 acres.

Typically, the surface layer is brown silt loam about 4 inches thick. The subsurface layer is yellowish brown silt loam about 6 inches thick. From a depth of 10 to 14 inches, the subsoil is yellowish brown, mottled silt loam; from a depth of 14 to 30 inches, it is yellowish brown, mottled silt loam that grades to silty clay loam; from a depth of 30 to 38 inches, it is yellowish brown, mottled silty clay loam that is mixed with gray silt loam; and from a depth of 38 to 72 inches it is yellowish brown, mottled silty clay loam.

Included in this map unit are a few small areas of Caddo, Kinder, and Messer soils. The Caddo and Kinder soils are on broad flats and are poorly drained and grayish throughout. The Messer soils are on low circular mounds or smoothed mound areas and have less clay in the subsoil than the Glenmora soil. The included soils make up about 10 percent of the map unit.

This soil is low in fertility and has moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Runoff is medium. A seasonal high water table is 2 to 3 feet below the surface during December through April. This soil has a moderate shrink-swell potential.

This soil is mainly used as woodland. A few areas are used as cropland, pasture, or homesites.

This Glenmora soil is well suited to woodland. The main management concerns are the moderate equipment limitation, severe plant competition, and the risk of soil compaction caused by wetness. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Soil compaction can be reduced by using proper logging systems, laying out skid trails in advance, and harvesting timber when the soil is least susceptible to compaction. Suitable trees to plant are loblolly pine, slash pine, water oak, and cherrybark oak.

This soil is moderately well suited to cultivated crops. It is limited mainly by the hazard of erosion, low fertility, and moderately high levels of exchangeable aluminum within the root zone. Soybeans is the main crop, but corn, wheat, and rice are also grown. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content, but excessive cultivation can result in the formation of a tillage pan. This pan can be broken by subsoiling when the soil is dry. Keeping crop residue on or near the surface helps to control runoff and to maintain soil tilth and organic matter content. Limiting tillage for seedbed preparation and weed control reduces runoff and erosion. All tillage should be on the contour or across the slope. Crops respond to additions of lime and fertilizer, which improve fertility and reduce the level of exchangeable aluminum.

This Glenmora soil is well suited to pasture. Suitable pasture plants are bahiagrass, improved bermudagrass, common bermudagrass, ryegrass, and white clover. Low fertility and the erosion hazard are management concerns. A seedbed should be prepared on the contour or across the slope where practical. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant community. Proper grazing, weed control, and additions of fertilizer are needed for maximum quality of forage.

This soil is moderately well suited to urban development. The main limitations are wetness, the slow permeability, the moderate shrink-swell potential, and low strength on sites for local roads and streets. Preserving the existing plant cover during construction helps reduce erosion. Plant cover can be established and maintained by fertilizing, seeding, mulching, and shaping slopes. The slow permeability and the seasonal high water table increase the possibility that septic tank absorption fields will fail. Sewage lagoons or self-contained disposal systems can be used to dispose of sewage properly. Roads should be designed to offset the limited ability of the soil to support loads. Drainage can improve this soil for homesites. Excess water can be removed by providing the proper grade. Footings and foundations of buildings can be strengthened to prevent damage to buildings caused by shrinking and swelling of the subsoil.

This Glenmora soil is moderately well suited to recreational development. The main limitations are wetness and slow permeability. Slope is an additional limitation to playgrounds. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover. The plant cover can be maintained by controlling traffic. Excess water can be removed by shallow ditches or by providing the proper grade.

This soil is well suited to use as habitat for openland and woodland wildlife. Habitat for deer and squirrels can be improved by selectively harvesting timber so that large den and mast-producing trees are left. Habitat also can be improved by planting appropriate vegetation, by maintaining existing plant cover, or by promoting the natural establishment of desirable plants.

This Glenmora soil is in capability subclass IIe. The woodland ordination symbol is 10A.

GrC—Gore silt loam, 1 to 5 percent slopes. This soil is gently sloping and moderately well drained. It is on side slopes along drainageways on terraces. Areas are irregular in shape and range from 40 to 250 acres.

Typically, the surface layer is brown silt loam about 4 inches thick. From a depth of 4 to 32 inches, the subsoil is yellowish red, mottled clay; from a depth of 32 to 39 inches, it is yellowish red, mottled silty clay loam; from a depth of 39 to 49 inches, it is stratified yellowish red and greenish gray, mottled silty clay loam; and from a depth of 49 to 63 inches, it is yellowish red, stratified and mottled loam and silty clay loam. The underlying material, to a depth of 74 inches, is yellowish red, mottled loam. In places, the upper part of the subsoil is brownish clay.

Included in mapping are a few small areas of the Acadia and Kaplan soils on level and very gently sloping parts of the landscape. The Acadia soils have a subsoil that is brownish in the upper part. The Kaplan soils have a grayish subsoil. The included soils make up about 10 percent of the map unit.

This Gore soil has medium fertility. Water and air move through this soil at a very slow rate. Runoff is medium. Plant roots penetrate the clayey subsoil with difficulty. This soil has a high shrink-swell potential.

This soil is mostly used as woodland. A small acreage is used for pasture.

This soil is moderately well suited to woodland. The main management concerns in producing and harvesting timber are the moderate equipment limitation and moderate seedling mortality caused by the clayey subsoil. The soil may be compacted if it is wet when heavy equipment is used. Because the subsoil is sticky when wet, most planting and harvesting equipment can be used only during dry periods. Special planting stock that is larger than is normally used or containerized planting stock can reduce the seedling mortality rate. Suitable trees to plant are loblolly pine and slash pine.

This Gore soil is moderately well suited to pasture. The main management concerns are low fertility and the erosion hazard. Suitable pasture plants are bahiagrass, improved bermudagrass, common bermudagrass, crimson clover, and vetch. Where practical, seedbed preparation should be on the contour or across the slope. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is moderately well suited to cultivated crops, mainly soybeans. The main limitation is low fertility. Erosion is a severe hazard. Early fall seeding, conservation tillage, and constructing terraces, diversions, and grassed waterways are practices that help to control erosion . Crops respond well to additions of lime and fertilizer.

This Gore soil is poorly suited to urban and recreational development. The erosion hazard is severe, and the shrink-swell potential is high. Where septic tanks are used, the very slow permeability can be partly overcome by increasing the size of the absorption field. Low strength also is a limitation on sites for local roads and streets. Preserving the existing plant cover during construction helps to control erosion. Plant cover can be established and maintained by fertilizing, seeding, mulching, and shaping slopes. Designs for buildings and roads should offset the effects of shrinking and swelling and the limited ability of the soil to support a load.

This soil is moderately well suited to use as habitat for openland and woodland wildlife. Habitat can be improved by selectively harvesting timber so that large den and mast-producing trees are left and by planting or encouraging the growth of suitable understory plants.

This Gore soil is in capability subclass IVe. The woodland ordination symbol is 7C.

GtA—Guyton silt loam, occasionally flooded. This soil is level and poorly drained. It is on broad flats and in depressions on terraces. Areas are irregular in shape and range from 40 to 1,000 acres. Slope is less than 1 percent.

Typically, the surface layer is grayish brown silt loam about 5 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 24 inches thick. It extends into the next layer. The upper part of the subsoil from a depth of 29 to 50 inches is grayish brown, mottled silty clay loam that is mixed with light brownish gray silt loam. The lower part of the subsoil to a depth of 80 inches is light brownish gray, mottled silty clay loam. The underlying material to a depth of 90 inches is light brownish gray, mottled silty clay loam.

Included in this map unit are a few small areas of Caddo, Glenmora, and Messer soils. The Caddo soils are in landscape positions similar to those of the Guyton soil and have red mottles in the subsoil. The Glenmora soils are on ridgetops and side slopes and have a subsoil that is brownish throughout. The Messer soils are on low mounds or smoothed mound areas and have a brownish subsoil. Also included in low areas, are small areas of frequently flooded Guyton soils. The included soils make up about 15 percent of the map unit.

This soil is low in fertility and has high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Wetness restricts root development of many plants. Runoff is very low. A seasonal high water table is perched on the subsoil and fluctuates between a depth of 1.5 feet and the soil surface during December through May. This soil is subject to brief periods of flooding. Flooding is occasional and occurs mostly in winter and spring, but it can occur during any season. The surface layer of this soil remains wet for long periods after heavy rain. This soil has a low shrink-swell potential

This soil is used mostly as woodland. A few areas are used as pasture.

This Guyton soil is moderately well suited to woodland. The main management concerns in producing and harvesting timber are the restricted use of equipment, the risk of soil compaction, and the seedling mortality caused by wetness and flooding. Also, competition from understory plants is severe. Only trees that can tolerate seasonal wetness should be planted. Using standard-wheeled and tracked equipment when the soil is moist causes rutting and compaction. Using low-pressure ground equipment during wet periods or delaying harvest until the soil is dry reduces damage to the soil and helps to maintain productivity. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Providing artificial drainage and using special site preparation, such as harrowing and bedding, will help in establishing seedlings, reducing seedling mortality, and increasing early seedling growth. Suitable trees to plant are loblolly pine, sweetgum, green ash, and water oak.

This soil is moderately well suited to pasture. The main limitation is wetness, and flooding is a hazard. Low fertility is a minor limitation. The main pasture plants are common bermudagrass, Pensacola bahiagrass, and ryegrass. Grazing when the soil is wet compacts the surface layer. Wetness restricts the use of equipment. Proper stocking rates, pasture rotation, and restricted grazing during wet periods helps keep the pasture and soil in good condition. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is poorly suited to cultivated crops. Wetness, high levels of exchangeable aluminum, low fertility, and the potential flood hazard restrict its use. Rice and soybeans can be grown if they are planted late and if flooding can be controlled. Proper row arrangement, field ditches, and suitable outlets are needed to remove excess water. Crop residue left on the surface helps to maintain soil tilth and the organic matter content. Crops respond well to applications of lime and fertilizer, which improve fertility and reduce the level of exchangeable aluminum.

This Guyton soil is poorly suited to recreational and urban development. Wetness and the slow permeability are the main limitations, and flooding is a hazard. In addition, low strength is a limitation on sites for local roads and streets. Drainage and protection from flooding are needed if buildings are constructed. Drainage also can improve this soil for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. Roads and streets should be located above the expected flood level. Flooding is best controlled by use of major flood control structures. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, sewage lagoons or self-contained absorption field can be used to dispose of sewage properly.

This soil is moderately well suited to use as habitat for openland and woodland wildlife. It is well suited to use as habitat for wetland wildlife. Habitat can be improved by selectively cutting so that large den and mast-producing trees are left and by planting or encouraging the growth of suitable understory plants.

This Guyton soil is in capability subclass IVw. The woodland ordination symbol is 8W.

GUA—Guyton and Bienville soils, frequently flooded. These soils are level and very gently sloping and are poorly drained and somewhat excessively drained. They are on flood plains and remnants of terraces. Areas are long and narrow and range from 30 to 2,500 acres. Most mapped areas contain both soils in varying proportions, but some areas contain only one of the soils. In areas that contain both soils, the Guyton soil is in low positions on the flood plains, and the Bienville soil is on low ridges which are remnants of terraces. The ridges are mostly 100 feet to 300 feet wide. The mapped areas contain about 55 percent Guyton soil and about 25 percent Bienville soil. The Guyton soil has a slope of less than 1 percent, and the Bienville soil has slopes that range from 1 to 3 percent.

The Guyton soil is level and poorly drained. Typically, it has a surface layer of dark grayish brown silt loam about 4 inches thick. The subsurface layer is about 16 inches thick. It is grayish brown and light brownish gray, mottled silt loam. It extends into the next layer. The subsoil extends to a depth of 60 inches. The upper part is light brownish gray, mottled silty clay loam that is mixed with light brownish gray silt loam; the middle part is light brownish gray, mottled silty clay loam; and the lower part is light brownish gray, mottled clay loam.

This soil is low in fertility and high in levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Runoff is very low. A seasonal high water table is perched on the subsoil and fluctuates between a depth of about 1.5 feet and the soil surface during December through May. This soil is frequently flooded for brief to long periods, mostly in winter and spring. Depth of the floodwater ranges from 1 to 6 feet. The surface layer of this soil remains wet for long periods after heavy rains. This soils has a low shrink-swell potential.

The Bienville soil is very gently sloping and somewhat excessively drained. Typically, it has a surface layer of dark grayish brown loamy fine sand about 4 inches thick. The subsurface layer is pale brown loamy fine sand about 10 inches thick. The subsoil extends to a depth of 60 inches. The upper part is strong brown and very pale brown loamy fine sand; the next part is yellowish brown loamy fine sand; and the lower part is light yellowish brown loamy fine sand. In places, the subsoil is loamy.

This soil is low in fertility. Water and air move through this soil at a moderately rapid rate. Runoff is low. A seasonal high water table is at a depth of 4 to 6 feet during December through April. This soil is frequently flooded for long periods, mostly in winter and spring. Depth of the floodwater ranges from 1 to 6 feet. Plants are damaged from a lack of water during dry periods in the summer and fall of most years. This soil dries quickly after heavy rain. The shrink-swell potential is low.

Included in this map unit are a few small areas of Acadia, Basile, Caddo, Gore, and Kinder soils. The Acadia and Gore soils are on side slopes of terraces and have a loamy and clayey subsoil. The Basile soils are in landscape positions similar to those of the Guyton soil, and they are alkaline in the lower part of the subsoil. The Caddo and Kinder soils are in higher positions on terraces and contain red mottles in the subsoil. The included soils make up 20 percent of the map unit.

These soils are mostly used as woodland and as habitat for woodland wildlife. A few small areas are used as pasture.

These soils are moderately well suited to woodland. The main management concerns in producing and harvesting timber are moderate or severe equipment limitations and severe seedling mortality caused by wetness and flooding. In addition, plant competition is severe in areas of the Guyton soil. The Guyton soil also compacts if it is wet when heavy equipment is used. Trafficability in areas of the Bienville soil is poor when the sandy surface layer is dry. Droughtiness also can be a limitation in areas of the Bienville soil. Conventional methods of harvesting timber generally can be used, but their use may be limited during rainy periods, mostly from December to May. Suitable trees to plant are nuttall oak and green ash on the Guyton soil and loblolly pine, water oak, and nuttall oak on the Bienville soils.

The soils in this map unit are poorly suited to crops and pasture. The main limitation is wetness, and flooding is a hazard. Low fertility is a minor limitation. Common bermudagrass and native grasses are suitable pasture plants. During periods of flooding, cattle should be moved to areas that are protected from flooding or to pastures at higher elevations. Applying high rates of fertilizer is generally not feasible because of frequent overflow.

The Guyton soil in this map unit is moderately well suited to use as habitat for woodland wildlife, and the Bienville soil is well suited to this use. The Guyton soil also is well suited to use as habitat for wetland wildlife. Habitat can be improved by leaving large mast producing trees when harvesting timber, by planting or promoting the growth of desirable understory plants, and by planting food plots in small woodland openings. Small ponds can be constructed in areas of the Guyton soil to provide open water areas for waterfowl and furbearers.

These soils are not suited to urban development. Wetness and flooding are generally too severe for this use.

Figure 8.—Contour levees impound irrigation water in an area of Judice silty clay. Rice fields are flooded to control weeds and enhance the production of rice.

These soils are poorly suited to recreation areas. Wetness is the main limitation, and flooding is a hazard. Drainage and protection from flooding are needed for most recreational uses.

The soils in this map unit are in capability subclass Vw. The woodland ordination symbol is 6W for the Guyton soil and 8W for the Bienville soil.

JdA—Judice silty clay. This soil is level and poorly drained. It is in broad depressional areas on terraces of the Gulf Coast Prairies and is subject to rare flooding. Slope is less than 1 percent.

Typically, the surface layer is black silty clay about 9 inches thick. The next layer is very dark gray silty clay about 11 inches thick. The subsoil to a depth of about 70 inches is gray, mottled silty clay in the upper part and light gray, mottled silty clay in the middle and lower parts.

Included with this soil in mapping are a few small areas of Kaplan, Midland, Morey, and Mowata soils. None of these soils have a black or very dark gray surface layer, except for the Morey soils. The Morey soils are loamy throughout. The Kaplan soils are higher on the landscape than the Judice soil. The Midland, Morey, and Mowata soils are in landscape positions similar to those of the Judice soil. Included soils make up about 10 percent of the map unit.

This Judice soil has high fertility. Runoff is very low. Water and air move through this soil at a very slow rate. A seasonal high water table fluctuates between a depth of about 1.5 feet and the soil surface during December through April. This soil is subject to rare flooding during unusually wet periods. The surface layer dries slowly after heavy rain, and it is sticky when wet and hard when dry. This soil has a high shrink-swell potential.

This soil is used mainly as cropland. A few areas are used for pasture.

This soil is moderately well suited to cultivated crops. Wetness and poor tilth are the main limitations. Rice is the main crop, but soybeans and grain sorghum also are grown. This Judice soil is difficult to keep in good tilth. It can be worked only within a narrow range of moisture content. Proper row arrangement, field ditches, and suitable outlets are needed to remove excess surface water. Land grading and smoothing can improve surface drainage, allow more uniform application of irrigation water, and permit more efficient use of farm equipment. Flood irrigation is needed for growing rice (fig. 8). The organic matter content can be maintained by using all crop residue, plowing under cover crops, and using a suitable cropping system. Most crops respond well to applications of fertilizer.

This Judice soil is moderately well suited to pasture. Wetness is the main limitation. The suitable pasture plants are common bermudagrass, dallisgrass, ryegrass, tall fescue, and white clover. Excessive water on the surface can be removed by field ditches and suitable outlets. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer is generally needed for the optimum growth of grasses and legumes.

This soil is moderately well suited to woodland. However, it will not likely be used for commercial timber production because all areas of this map unit are in cropland or pasture. The native vegetation was tall prairie grasses. The main limitations to producing trees are severe equipment limitations, severe plant competition, soil compaction, and severe seedling mortality caused by wetness and the clayey surface layer. Suitable trees to plant are water oak, nuttall oak, and green ash.

This Judice soil is poorly suited to urban development. The main limitations are wetness, the very slow permeability, the high shrink-swell potential, and low strength on sites for local roads and streets. Flooding is a hazard. Drainage and other water control systems help to remove excess water and control flooding. The very slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained sewage disposal units may be used to dispose of sewage properly. Buildings can be constructed on mounds to raise them above expected flood elevations. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Drainage can improve the soil for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. Designs for local roads and streets can overcome the limited ability of the soil to support a load.

This soil is poorly suited to recreational development. The main limitations are wetness, the very slow permeability, and the clayey surface layer. Flooding is a hazard to camp areas. Drainage can improve this soil for most recreational uses. The surface layer is sticky when wet. This problem can be overcome by coating the surface with a layer of loamy material.

This soil is well suited to use as habitat for woodland and wetland wildlife. The main management concern for wetland wildlife habitat is controlling water levels. Habitat for wildlife can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

This Judice soil is in capability subclass IIIw. The woodland ordination symbol is 7W.

KpA—Kaplan silt loam, 0 to 1 percent slopes. This soil is level and somewhat poorly drained. It is on broad, slightly convex ridges on terraces of the Gulf Coast Prairies.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The next layer is dark gray silt loam about 7 inches thick. The subsoil extends to a depth of 79 inches. From a depth of 14 to 20 inches it is dark gray, mottled silty clay; from a depth of 20 to 29 inches it is gray, mottled silty clay; from a depth of 29 to 37 inches it is light olive brown and gray, mottled silty clay; from a depth of 37 to 51 inches it is gray, mottled silty clay; and from a depth of 51 to 79 inches it is light gray, mottled silty clay.

Included with this soil in mapping are a few small areas of Crowley, Midland, Morey, and Mowata soils. The Crowley soils are slightly higher on the landscape than the Kaplan soil and have an abrupt textural change between the subsurface layer and the subsoil. The Midland, Morey, and Mowata soils are lower on the landscape than the Kaplan soil. The Midland and Mowata soils do not have red mottles in the upper part of the subsoil. Also, the Mowata soils have a subsurface layer that extends into the subsoil. The Morey soils have a very dark gray surface layer. Included soils make up about 15 percent of the map unit.

This Kaplan soil has medium fertility. Runoff is low. Water and air move through this soil at a slow rate. A seasonal high water table fluctuates between depths of 1.5 and 2.5 feet below the surface during December through April. This soil has a high shrink-swell potential.

This soil is mainly used as cropland. A small acreage is used for pasture or homesites.

This Kaplan soil is moderately well suited to cultivated crops. The main limitation is wetness. Medium fertility is a minor limitation. Rice and soybeans are the main crops, but corn and small grain are also grown. Proper row arrangement, field ditches, and suitable outlets help to remove excess water. Land grading and smoothing can improve surface drainage, allow more uniform application of irrigation water, and permit more efficient use of farm equipment. Proper irrigation systems should be used for the production of rice. Pipe or other drop structures can be installed in drainage ditches to control the water level in rice fields and to prevent excessive erosion of ditches. This soil is friable and easy to keep in good tilth. Traffic pans form easily, but these can be broken up by deep plowing or chiseling. Returning all crop residue to the soil and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to maintain fertility and tilth. Crops respond well to applications of fertilizer.

This soil is moderately well suited to pasture. The main limitation is wetness. Medium fertility is a minor limitation. The main pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, white clover, and wild winter peas. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Excessive water on the surface can be removed by field ditches and suitable outlets. Fertilizer is needed for the optimum growth of grasses and legumes.

This Kaplan soil is moderately well suited to woodland. However, most areas are in cropland, and they are not likely to be used for commercial timber production. The native vegetation was tall prairie grasses. If this soil is used for commercial timber production, the main concerns are a moderate equipment limitation, the risk of soil compaction, and severe plant competition caused by wetness. Suitable trees to plant are water oak, green ash, and cherrybark oak.

This soil is poorly suited to urban development. The main limitations are wetness, the slow permeability, the high shrink-swell potential, and low strength on sites for local roads and streets. Excess water can be removed by using shallow ditches and providing the proper grade. Septic tank absorption fields do not function properly during rainy periods because of wetness and the very slow permeability. Lagoons or self-contained sewage disposal units may be used to dispose of sewage properly. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. The design of roads and streets can offset the limited ability of the soil to support a load.

This Kaplan soil is moderately well suited to recreational development. Wetness and the very slow permeability are the main limitations. Drainage can improve this soil for most recreational uses.

This soil is well suited to use as habitat for wetland wildlife and moderately well suited to use as habitat for openland and woodland wildlife. Constructing shallow ponds can improve the habitat for wetland wildlife. Habitat for openland and woodland wildlife can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

This Kaplan soil is in capability subclass IIIw. The woodland ordination symbol is 6W.

KpB—Kaplan silt loam, 1 to 3 percent slopes. This soil is very gently sloping and somewhat poorly drained. It is on side slopes along abandoned stream channels on terraces of the Gulf Coast Prairies.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The next layer is dark grayish brown, mottled silt loam about 3 inches thick. The subsoil to a depth of about 80 inches is dark grayish brown, mottled silty clay in the upper part and light brownish gray, mottled silty clay in the middle and lower parts. In places, the slope is less than 1 percent.

Included with this soil in mapping are a few small areas of Acadia, Crowley, Gore, and Vidrine soils. The Acadia soils are in landscape positions similar to those of the Kaplan soil and are acid throughout. The Crowley soils are on ridges and on the sides of ridges and have an abrupt change in texture from the subsurface layer to the subsoil. The Gore soils are on steeper side slopes than the Kaplan soil and have a reddish subsoil. The Vidrine soils are on mounds, smoothed mound areas, or on side slopes of relict natural levees. They are loamy and brown in the upper part of the subsoil. Included soils make up about 15 percent of the map unit.

This soil is medium in fertility. Water and air move through this soil at a slow rate. Runoff is medium. A seasonal high water table is at a depth of about 1.5 to

2.5 feet during December through April. The shrink-swell potential is high in the subsoil.

This Kaplan soil is mainly used as cropland. A few areas are used as pasture or homesites.

This soil is moderately well suited to cultivated crops, mainly rice and soybeans. Erosion is the main hazard. Wetness and medium fertility are limitations. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by subsoiling when the soil is dry. Keeping crop residue on or near the surface helps to control runoff and maintain soil tilth and organic matter content. The hazard of erosion can be reduced if fall grain is seeded early, stubble-mulch tillage is used, and tillage and seeding are on the contour or across the slope. Also, waterways should be shaped and seeded to perennial grass.

This soil is moderately well suited to pasture. Slope, wetness, and medium fertility are minor limitations. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, white clover, wild winter peas, and vetch. Where practical, a seedbed should be prepared on the contour or across the slope. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff. Proper grazing, weed control, and applications of fertilizer are needed for maximum quality forage.

This Kaplan soil is moderately well suited to woodland. However, most areas are in cropland, and homesites and are not likely to be used for commercial timber production. The native vegetation is tall prairie grasses. If this soil is used for commercial timber production, the main concerns are a moderate equipment limitation, soil compaction, and severe plant competition caused by wetness. Suitable trees to plant are water oak, green ash, and cherrybark oak.

This soil is poorly suited to urban development. The main limitations are wetness, the slow permeability, the high shrink-swell potential, and low strength on sites for local roads and streets. Excess water can be removed by shallow ditches and by providing the proper grade. Septic tank absorption fields do not function properly during rainy periods because of wetness and the slow permeability. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. Buildings and roads can be designed to offset the effects of shrinking and swelling. Designs for roads can also offset the limited ability of the soil to support a load.

This Kaplan soil is moderately well suited to recreational development. The main limitations are wetness and the slow permeability. The slope also is a limitation to playgrounds. Cuts and fills should be seeded or mulched. Controlling traffic can help maintain plant cover and reduce erosion. Excess surface water can be removed by shallow ditches and by providing the proper grade.

This soil is moderately well suited to use as habitat for openland, woodland, and wetland wildlife. Habitat for openland and woodland wildlife can be improved by planting appropriate vegetation, by maintaining existing plant cover, and by promoting the natural establishment of desirable plants.

This Kaplan soil is in capability subclass IIIe. The woodland ordination symbol is 6W.

KrA—Kinder-Messer silt loams. These soils are level and gently sloping, poorly drained and moderately well drained. They are on terraces of the Gulf Coast Prairies. The landscape consists of broad flats that contain many low mounds. The mounds are circular and range from 30 to 150 feet across and from 1 to 6 feet high. In places the mounds have been smoothed by mechanical means. Individual areas of this complex range from 30 to 1,500 acres and contain about 60 percent Kinder soil and about 30 percent Messer soil. The poorly drained Kinder soil is in the intermound areas, and the moderately well drained Messer soil is on the mounds or smoothed mound areas. The soils in this map unit are so intricately mixed that it is not practical to map them separately at the scale used. Slope is less than 1 percent in the intermound areas. Slopes range from 1 to about 5 percent on the mounds. Slopes are 0 to 1 percent on smoothed mound areas.

Typically, the Kinder soil is level and has a surface layer of dark gray silt loam about 4 inches thick. The subsurface layer is grayish brown silt loam about 15 inches thick. It extends into the next layer. The subsoil from a depth of 19 to 28 inches is grayish brown, mottled silty clay loam that is mixed with grayish brown silt loam; from a depth of 28 to 40 inches it is grayish brown, mottled silty clay loam; from a depth of 40 to 50 inches it is light brownish gray, mottled silty clay loam. The underlying material from a depth of 50 to 65 inches is light brownish gray, silt loam; from a depth of 65 to 80 inches it is light brownish gray, mottled silty clay loam that is mixed with gray silt loam; and from a depth of 80 to 88 inches it is light brownish gray, mottled silty clay loam.

This soil is low in fertility and has high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Runoff is low. This soil dries slowly after heavy rain. A seasonal high water table is perched on the subsoil and fluctuates between a depth of 2 feet and the soil surface during December through April. This soil has a moderate shrink-swell potential.

Typically, the Messer soil is level or gently sloping and has a surface layer of dark grayish brown silt loam about 4 inches thick. The subsurface layer is light yellowish brown silt loam about 4 inches thick. The subsoil extends to a depth of 72 inches. From a depth of 8 to 34 inches it is light yellowish brown silt loam that has brownish mottles with depth; from a depth of 34 to 40 inches it is pale brown, mottled silty clay loam that is mixed with light gray silt loam; and from a depth of 40 to 72 inches it is brown, mottled silty clay loam.

This soil is low in fertility and has high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Runoff is medium. A seasonal high water table is perched on the subsoil at a depth of 2 to 4 feet below the surface during December through May. Where mounds have been smoothed, runoff is low, and the seasonal high water table fluctuates between a depth near the surface and 2 feet below the surface. Plant roots penetrate this soil easily. This soil has a low shrink-swell potential.

Included in this map unit are a few small areas of Acadia, Crowley, Guyton, and Mowata soils. The Acadia, Crowley, and Mowata soils have a loamy and clayey subsoil. The Acadia soils are on side slopes along drainageways. The Crowley soils are on side slopes and on broad convex ridges. The Mowata soils are lower on the landscape than the Kinder and Messer soils. The Guyton soils are also lower on the landscape and do not have red mottles in the subsoil. The included soils make up about 10 percent of the map unit.

Most areas of this map unit are used as woodland and cropland. A few areas are used as pasture or homesites.

These soils are moderately well suited to woodland. The main management concern in producing and harvesting timber is wetness, which limits the use of equipment, increases the risk of soil compaction, and encourages the growth of unwanted understory plants. Conventional methods of harvesting timber can be used, but their use may be limited during rainy periods, generally from December to March. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Suitable trees to plant are loblolly pine, slash pine, water oak, cherrybark oak, and green ash.

These soils are moderately well suited to cultivated crops. The main limitations are wetness, low fertility, and high levels of exchangeable aluminum within the root zone. Erosion is a hazard on the mounds. The numerous mounds interfere with cultivation, drainage, and irrigation. Soybeans is the main crop. Rice is grown where the small mounds have been smoothed by mechanical means. Land grading and smoothing improve surface drainage, allow more uniform application of irrigation water, and permit more efficient use of farm equipment. These soils are easy to work and to keep in good tilth, but a crust forms readily on the surface. Crop residue returned to the soil or regular additions of other organic material improves fertility, reduces crusting, and increases the water intake rate. Pipe or other drop structures can be installed in drainage ditches to control the water level in rice fields and to prevent excessive erosion of ditches. Crops respond well to additions of lime and fertilizer, which improve fertility and reduce the level of exchangeable aluminum.

The soils in this map unit are moderately well suited to pasture. The main limitations are wetness and low fertility. Erosion is a hazard on the mounds. The main pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, white clover, wild winter peas, and ryegrass. Excess surface water can be removed by shallow ditches and suitable outlets. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Maintaining plant cover helps to control erosion. Applications of fertilizer and lime are needed for optimum growth of grasses and legumes.

The Kinder soil in this map unit is poorly suited to urban development. The Messer soil is moderately well suited to this use. The main limitations are wetness, the slow permeability, and low strength on sites for local roads and streets. Excess water can be removed by using shallow ditches and by providing the proper grade. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. The design of roads can offset the limited ability of the soil to support a load.

The Kinder soil in this map unit is poorly suited to recreational development. The Messer soil is moderately well suited to this use. The main limitations are wetness and the slow permeability . The slope on the Messer soil and the uneven landscape are limitations to playgrounds. Drainage, land grading, and smoothing can improve these soils for most recreational uses. Maintaining the plant cover can help to control erosion on the Messer soil.

The plant cover can be maintained by applying fertilizer and controlling traffic.

These soils are well suited to use as habitat for woodland wildlife. The Kinder soil is moderately well suited to use as habitat for openland wildlife, and the Messer soil is well suited to this use. The Kinder soil also is well suited to use as habitat for wetland wildlife. Habitat for woodland wildlife can be improved by selectively harvesting timber so that large den and mast-producing trees are left. Habitat for openland wildlife can be improved by planting appropriate vegetation, by maintaining existing plant cover, or by promoting the natural establishment of desirable plants. Constructing shallow ponds in areas of the Kinder soil can provide open water areas for waterfowl and furbearers.

The Kinder soil in this complex is in capability subclass IIIw, and the Messer soil is in IIIe. The woodland ordination symbol is 11W for the Kinder soil and 10W for the Messer soil.

LeA—Leton silt loam. This soil is level and poorly drained. It is on broad flats, in long narrow depressional areas, and along drainageways on terraces of the Gulf Coast Prairies. It is subject to rare flooding. Areas are irregular in shape and range from 20 to 400 acres. Slope is less than 1 percent.

Typically, the surface layer is grayish brown silt loam about 7 inches thick. The subsurface layer is grayish brown silt loam about 21 inches thick. It extends into the next layer. The upper part of the subsoil from a depth of 28 to 45 inches is light brownish gray, mottled silty clay loam that is mixed with gray loam. The lower part of the subsoil from a depth of 45 to 75 inches is light brownish gray, mottled silty clay loam. The underlying material to a depth of
86 inches is light brownish gray, mottled clay loam.

Included in this map unit are a few small areas of Crowley, Kaplan, Morey, Mowata, and Vidrine soils. The Crowley and Kaplan soils are on ridges and have a loamy and clayey subsoil. The Crowley soils are also on side slopes of convex ridges. The Morey and Mowata soils are higher on the landscape than the Leton soil. The Morey soils have a very dark gray surface layer. The Mowata soils have a loamy and clayey subsoil. The Vidrine soils are on side slopes of relict natural levees or on mounds or smoothed mound areas, and they have a subsoil that is clayey in the lower part. Included soils make up about 10 percent of the map unit.

This soil is low in fertility. Water and air move through this soil at a slow rate. Runoff is very low. A seasonal high water table fluctuates between a depth of 1.5 feet and the soil surface during December through April. Wetness causes poor aeration and restricts root development. This soil is subject to rare flooding for short periods during unusually wet periods. The surface layer of this soil remains wet for long periods after heavy rain. The shrink-swell potential is moderate in the subsoil.

This soil is mostly used as cropland. A few areas are used as pasture, woodland, or homesites.

This Leton soil is moderately well suited to cultivated crops. The main limitations are wetness and low fertility. Rice and soybeans are the main crops. A tillage pan forms easily if this soil is tilled when wet, but this can be broken by chiseling or subsoiling. These soils are friable, but they are somewhat difficult to keep in good tilth because of surface crusting. Pipe or other drop structures can be installed in drainage ditches to control the water level in rice fields and to prevent excessive erosion of ditches. The organic matter content can be maintained by using all crop residue, plowing under cover crops, and using a suitable cropping system. Land grading and smoothing can improve surface drainage and permit more efficient use of farm equipment. Crops respond well to additions of lime and fertilizer.

This soil is moderately well suited to pasture. The main limitations are wetness and low fertility. Suitable pasture plants are common bermudagrass, bahiagrass, ryegrass, wild winter peas, and white clover. Grazing when the soil is wet results in compaction of the surface layer. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Applications of fertilizer and lime are needed for the optimum growth of grasses and legumes.

This soil is moderately well suited to woodland; however, most areas are in cropland and are not likely to be used for commercial wood production. The native vegetation is tall prairie grasses. If this soil is used as woodland, the main management concerns are severe equipment limitations, the risk of soil compaction, and severe seedling mortality caused by wetness. Also, plant competition is severe. Conventional methods of harvesting timber can be used, but their use may be limited during rainy periods, generally from December to April. Providing artificial drainage or using specialized site preparation, such as harrowing and bedding, can reduce the seedling mortality rate. Site preparation controls initial growth of unwanted understory plants and spraying, cutting, or girdling controls subsequent growth. Suitable trees to plant are loblolly pine, slash pine, water oak, willow oak, and green ash.

This Leton soil is poorly suited to urban development. The main limitations are the slow permeability, wetness, and low strength on sites for local roads and streets. Flooding is the main hazard. A drainage system is needed for best results with most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. Buildings can be placed on pilings or mounds to raise them above expected flood elevations. The design of roads can offset the limited ability of the soil to support a load. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly. Flooding can be controlled by levees, diversions, and water pumps.

This soil is poorly suited to recreational development. The main limitations are wetness and the slow permeability, and flooding is a hazard. Drainage can improve the soil for intensively used areas such as playgrounds. Excess water can be removed by shallow ditches and by providing the proper grade. Flooding can be controlled by levees, diversions, and water pumps.

This soil is well suited to use as habitat for wetland wildlife and moderately well suited to use as habitat for openland wildlife. The main concern in managing this soil for wetland wildlife is controlling water levels. Habitat for openland wildlife can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

This Leton soil is in capability subclass IIIw. The woodland ordination symbol is 9W.

LtA—Leton silt loam, occasionally flooded. This soil is level and poorly drained. It is on broad flats; in long, narrow depressional areas; and along drainageways on terraces of the Gulf Coast Prairies. It is subject to occasional flooding. Areas are irregular in shape and range from 20 to 400 acres. Slope is less than 1 percent.

Typically, the surface layer is grayish brown silt loam about 6 inches thick. The subsurface layer is about 23 inches thick. It is grayish brown silt loam grading to light brownish gray, mottled silt loam.The subsurface layer extends into the next layer. The upper part of the subsoil from a depth of 29 to 39 inches is light brownish gray, mottled silty clay loam that is mixed with light brownish gray loam. The lower part of the subsoil to a depth of 62 inches is light brownish gray, mottled loam.

Included in this map unit are a few small areas of Basile, Crowley, Guyton, Kinder, Mowata, and Vidrine soils. The Basile soils are on flood plains and are alkaline in the lower part of the subsoil. The Crowley soils are on ridges and side slopes and have a loamy and clayey subsoil. The Guyton soils are in landscape positions similar to those of the Leton soil and they have different mineralogy. The Kinder and Mowata soils are higher on the landscape than the Leton soil. The Kinder soils have red mottles in the upper part of the subsoil. The Mowata soils have a loamy and clayey subsoil. The Vidrine soils are on side slopes, mounds, or smoothed mound areas and have a subsoil that is clayey in the lower part. Included soils make up about 10 percent of the map unit.

This soil is low in fertility. Water and air move through this soil at a slow rate. Runoff is very low. A seasonal high water table fluctuates between a depth of 1.5 feet and the soil surface during December through April. This soil is subject to very brief to very long periods of flooding. Flooding is occasional and occurs mostly in winter and spring, but it can occur during any season. The surface layer remains wet for long periods after heavy rain. The shrink-swell potential is moderate in the subsoil.

This Leton soil is mainly used as woodland. A few areas are used as pasture or cropland.

This soil is moderately well suited to woodland. The main management concerns in producing and harvesting timber are restricted use of equipment, the risk of soil compaction, and the seedling mortality caused by wetness and flooding. Also, plant competition is severe. Only trees that can tolerate seasonal wetness should be planted. Using standard-wheeled and tracked equipment when the soil is moist causes rutting and compaction. Using low-pressure ground equipment or using equipment only when the soil is dry reduces damage to the soil and helps to maintain productivity. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Suitable trees to plant are loblolly pine, slash pine, water oak, willow oak, and green ash.

This soil is moderately well suited to pasture. The main limitations are wetness and low fertility. Flooding is the main hazard. The main pasture plants are common bermudagrass, bahiagrass, and ryegrass. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant community. The use of equipment also is limited by wetness. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed for the optimum growth of grasses and legumes.

This Leton soil is poorly suited to cultivated crops. The main limitations are wetness and low fertility. Flooding is a hazard. In some years, rice and soybeans can be grown if they are planted late. Proper row arrangement, field ditches, and suitable outlets help to remove excess water. Levees and water pumps are needed to control flooding. Leaving crop residue on the surface helps to maintain soil tilth and organic matter content. Crops respond well to additions of lime and fertilizer.

This soil is poorly suited to recreational development and urban development. The main limitations are wetness, the slow permeability, and low strength on sites for local roads and streets. Flooding is a hazard. Drainage and protection from flooding are needed if buildings are constructed. Drainage can improve the soil for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. Roads and streets should be located above the expected flood level. Flooding is best controlled by use of major flood control structures. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly.

This soil is moderately well suited to use as habitat for openland wildlife and well suited to use as habitat for woodland and wetland wildlife. Habitat for woodland wildlife can be improved by selectively cutting so that den and mast-producing trees are left and by planting or encouraging the growth of suitable understory plants. Habitat for openland wildlife can be improved by providing field borders and planting crops and grasses in narrow strips. Constructing shallow ponds and planting adapted seed producing crops can improve the habitat for waterfowl and furbearers.

This Leton soil is in capability subclass IVw. The woodland ordination symbol is 9W.

MdA—Midland silt loam. This soil is level and poorly drained. It is on broad flats and in slightly concave areas on terraces of the Gulf Coast Prairies. It is subject to rare flooding. Areas are irregular in shape and range from 75 to 800 acres. Slope is less than 1 percent.

Typically, the surface layer is dark gray, mottled silt loam about 6 inches thick. The subsoil extends to a depth of 75 inches. It is dark gray, mottled silty clay loam in the upper part and gray, mottled silty clay in the middle and lower parts.

Included in this map unit are a few small areas of Judice, Kaplan, Morey, and Mowata soils. The Judice and Morey soils are in landscape positions similar to those of the Midland soil and have black and very dark gray surface layers, respectively. The Kaplan soils are in higher positions and have red mottles in the upper part of the subsoil. The Mowata soils are in slightly higher positions and have a subsurface layer that extends into the subsoil. Included soils make up about 15 percent of the map unit.

This Midland soil has medium fertility. Water and air move through this soil at a very slow rate. Runoff is low or very low. A seasonal high water table fluctuates between a depth of 0.5 foot and 1.5 feet below the surface during December through April. The soil is subject to rare flooding during unusually wet periods. The surface layer is sticky when wet and hard when dry. It remains wet for long periods after heavy rain. The shrink-swell potential is high in the subsoil.

This soil is mainly used as cropland. A few areas are used as pasture or homesites.

This soil is moderately well suited to cultivated crops, mainly rice and soybeans. The main limitation is wetness. Medium fertility is a minor limitation. Wetness may delay the planting and harvesting of crops. Proper row arrangement, field ditches, and suitable outlets help to remove excess surface water. Land grading and smoothing can improve surface drainage and permit more efficient use of farm equipment. Pipe or other drop structures can be installed in drainage ditches to control the water level in rice fields and to prevent excessive erosion of ditches (fig. 9). The organic matter content can be increased and maintained by using all crop residue, plowing under cover crops, and using a suitable cropping system. Crops respond to additions of lime and fertilizer.

This Midland soil is moderately well suited to pasture. The limitations are wetness and medium fertility. The main pasture plants are common bermudagrass, ryegrass, dallisgrass, tall fescue, and white clover. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant community. Wetness limits the choice of plants and the period of grazing. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Excessive water on the surface

Figure 9.—Rice in an area of Midland silt loam, which is moderately well suited to crops. The overfall structure in the levee improves irrigation water management and protects the levee from erosion.

can be removed by field ditches and suitable outlets. Fertilizer and lime are needed for the optimum growth of grasses and legumes.

This soil is moderately well suited to woodland; however, few areas are likely to be used for commercial timber production. If this soil is used as woodland, the main limitations are severe equipment limitations, the risk of soil compaction, and moderate seedling mortality caused by wetness. Also, competition from unwanted understory plants is severe. Site preparation and harvesting can be done only during dry periods to reduce rutting and soil compaction. Artificial drainage or specialized site preparation, such as harrowing and bedding, can reduce the seedling mortality rate. Prescribed burning and chemical treatment control unwanted vegetation in pine woodland. Suitable trees to plant are loblolly pine, green ash, and water oak.

This Midland soil is poorly suited to urban development. The main limitations are wetness, the very slow permeability, the high shrink-swell potential, and low strength on sites for local roads and streets. Flooding is a hazard. Drainage is needed if roads and building foundations are constructed. Buildings can be placed on pilings or mounds to raise them above expected flood elevations. Buildings and roads should be designed to offset the effects of shrinking and swelling. Designs for roads also can offset the limited ability of the soil to support a load. The very slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained sewage disposal units may be used to dispose of sewage properly. Flooding can be controlled by levees, diversions, and water pumps.

This soil is poorly suited to recreational development. Wetness and the very slow permeability are the main limitations. Flooding is a hazard to camp areas. Excess water can be removed by shallow ditches and by providing the proper grade. Levees, diversions, and water pumps can help to control flooding.

This soil is well suited to use as habitat for wetland wildlife and moderately well suited to use as habitat for openland and woodland wildlife. The main management concern for wetland wildlife habitat is controlling water levels. Habitat for openland and woodland wildlife can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

The Midland soil is in capability subclass IIIw. The woodland ordination symbol is 4W.

MoA—Morey loam. This soil is level and poorly drained. It is on broad flats on terraces of the Gulf Coast Prairies. It is subject to rare flooding. Areas are irregular in shape and range from 40 to 1,400 acres. Slope is less than 1 percent.

Typically, the surface layer is very dark gray loam about 6 inches thick. The subsoil extends to a depth of 80 inches. From a depth of 6 to 19 inches it is very dark gray, mottled loam; and from a depth of 19 to 80 inches it is dark gray and gray, mottled clay loam.

Included in this map unit are a few small areas of Judice, Kaplan, Leton, Midland, and Mowata soils and many small areas of Vidrine soils. The Judice and Midland soils are lower on the landscape than the Morey soil and have a loamy and clayey subsoil. The Kaplan soils are in higher positions and have a loamy and clayey subsoil. The Leton soils are in lower positions and have a grayish brown surface layer. The Mowata soils are in landscape positions similar to those of the Morey soil and have a loamy and clayey subsoil. The Vidrine soils are on side slopes, mounds, or smoothed mound areas and have a subsoil that is clayey in the lower part. Included soils make up about 15 percent of the map unit. Of the included soils, Vidrine soils are dominant and make up from 5 to 10 percent of the map unit.

This soil is high in fertility. Water and air move through this soil at a slow rate. Runoff is low or very low. A seasonal high water table fluctuates between a depth of 2 feet and the soil surface during December through April. The surface layer remains wet for long periods after heavy rain. This soil is subject to rare flooding during unusually wet periods. Adequate water is available to plants in most years. The shrink-swell potential is high in the subsoil.

This soil is mainly used as cropland. A few areas are used as pasture or homesites.

This Morey soil is moderately well suited to cultivated crops, mainly rice and soybeans. The main limitation is wetness. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. A tillage pan forms easily if this soil is tilled when wet. Chiseling or subsoiling can be used to break up the tillage pan. Land grading and smoothing can improve surface drainage and permit more efficient use of farm equipment. Pipe or other drop structures can be installed in drainage ditches to control the water level in rice fields and to prevent excessive erosion of ditches. Maintaining crop residue on or near the surface helps to maintain soil tilth and organic matter content. Most crops and pasture plants respond well to additions of fertilizer.

This soil is moderately well suited to pasture. Wetness is the main limitation. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, wild winter peas, and white clover. Excessive water on the surface can be removed by shallow ditches or by land grading and smoothing. Proper grazing, weed control, and fertilizer are needed for maximum quality of forage.

This soil is moderately well suited to woodland; however, most areas are in cropland and are not likely to be used for commercial wood production. The native vegetation is tall prairie grasses. If this soil is used as woodland, the main management concerns are severe equipment limitations, severe seedling mortality, and the risk of soil compaction caused by wetness. Also, competition from understory plants is severe. Conventional methods of harvesting timber can be used, but their use may be limited during rainy periods, generally from December to April. Site preparation and harvesting can be done only during dry periods to reduce rutting and soil compaction. Site preparation controls initial growth of unwanted understory plants, and spraying and cutting control subsequent growth. Artificial drainage or harrowing and bedding improve the rate of seedling survival. Suitable trees to plant are loblolly pine, slash pine, green ash, and water oak.

This Morey soil is poorly suited to urban development. The main limitations are the slow permeability, wetness, the high shrink-swell potential, and low strength on sites for local roads and streets. Flooding is a hazard to dwellings and small commercial buildings. Excess water can be removed by shallow ditches and by providing the proper grade. Buildings can be constructed on pilings or mounds to raise them above expected flood elevations. The design of roads can offset the limited ability of the soil to support a load. Septic tank absorption fields do not function properly during rainy periods because of wetness and slow permeability. If flooding is controlled, sewage lagoons or self-contained disposal units can be used to control sewage properly.

This soil is poorly suited to recreational development. The main limitations are wetness and the slow permeability. Flooding is a hazard to camp areas. Drainage can improve this soil for most recreational uses. Flooding can be controlled by levees, diversions, and water pumps.

This soil is well suited to use as habitat for wetland wildlife and moderately well suited to use as habitat for openland and woodland wildlife. The main management concern for wetland wildlife habitat is controlling water levels. Habitat for openland and woodland wildlife can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

This Morey soil is in capability subclass IIIw. The woodland ordination symbol is 9W.

MtA—Mowata silt loam. This soil is level and poorly drained. It is on broad flats and along drainageways on terraces of the Gulf Coast Prairies. It is subject to rare flooding. Slope is less than 1 percent.

Typically, the surface layer is grayish brown silt loam about 8 inches thick. The subsurface layer is about 17 inches thick. It is grayish brown silt loam, and it extends into the next layer. The upper part of the subsoil from a depth of 25 to 34 inches is light brownish gray, mottled silty clay that is mixed with grayish brown silt loam. The lower part of the subsoil to a depth of 62 inches is light brownish gray, mottled silty clay.

Included with this soil in mapping are a few small areas of Crowley, Kaplan, Leton, and Midland soils. The Crowley and Kaplan soils are higher on the landscape than the Mowata soil. The Crowley soils have an abrupt textural change between the subsurface layer and the subsoil. In the Kaplan soils, the subsoil has red mottles in the upper part and is alkaline in the lower part. The Leton and Midland soils are in landscape positions similar to those of the Mowata soil. The Leton soils are loamy throughout. The Midland soils are similar to the Mowata soil, but they do not have a subsurface layer that extends into the subsoil. Included soils make up about 10 percent of the map unit.

This Mowata soil has medium fertility. Runoff is very low. Water and air move through the soil at a very slow rate. A seasonal high water table fluctuates between a depth of about 2 feet and the soil surface during the months of December through April. This soil is subject to rare flooding for brief periods during unusually wet periods. The Mowata soil has a high shrink-swell potential. The surface layer of this soil remains wet for long periods after heavy rain.

This soil is mainly used as cropland. A few areas are used as pasture or homesites.

This soil is moderately well suited to cultivated crops. It is limited mainly by wetness and potentially toxic levels of exchangeable aluminum within the root zone. Medium fertility is a minor limitation. Rice and soybeans are the main crops, but corn and small grain also are grown. Proper row arrangement, field ditches, and suitable outlets help to remove excess surface water. Land grading and smoothing can improve surface drainage, allow more uniform application of irrigation water, and permit more efficient use of farm equipment. Proper irrigation systems should be used for the production of rice. Pipe or other drop structures can be installed in drainage ditches to control the water level in rice fields and to prevent excessive erosion of ditches. Traffic pans form easily but can be broken up by deep plowing or chiseling. Returning all crop residue to the soil and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to maintain fertility and tilth. Crops respond well to additions of lime and fertilizer, which improve fertility and reduce the level of exchangeable aluminum.

This Mowata soil is moderately well suited to pasture. The main limitation is wetness. Medium fertility is a minor limitation. The main pasture plants are common bermudagrass, bahiagrass, ryegrass, white clover, and wild winter peas. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Excessive water on the surface can be removed by field ditches and suitable outlets. Applications of fertilizer and lime are needed for the optimum growth of grasses and legumes.

This soil is moderately well suited to woodland. Wetness limits the use of equipment, increases the risk of soil compaction, and causes moderate seedling mortality. Competition from unwanted understory plants is severe. Reforestation after harvesting can be carefully managed to reduce competition from undesirable understory plants. Artificial drainage and harrowing or bedding reduce the seedling mortality rate. Site preparation and harvesting can be scheduled during the drier periods to reduce rutting and soil compaction. Suitable trees to plant are loblolly pine, slash pine, greenash, and water oak.

This soil is poorly suited to urban development. The main limitations are wetness, the very slow permeability, the high shrink-swell potential, and low strength on sites for local roads and streets. Flooding is a hazard to dwellings and small commercial buildings. A drainage system is needed if roads and building foundations are constructed. Roads also can be designed to offset the limited ability of the soil to support a load. Septic tank absorption fields do not function properly during rainy periods because of wetness and the very slow permeability. If flooding is controlled, lagoons or self-contained sewage disposal units may be used to dispose of sewage properly. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Buildings can be constructed on pilings or mounds to raise them above expected flood elevations. Drainage improves the soil for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens.

This Mowata soil is poorly suited to recreational development. The main limitations are wetness and the very slow permeability. Rare flooding is a hazard to camp areas. Drainage can improve this soil for most recreational uses. Flooding can be controlled by levees, diversions, and water pumps. Excess surface water can be removed by shallow ditches and by providing the proper grade.

This soil is well suited to use as habitat for wetland wildlife and moderately well suited to use as habitat for openland and woodland wildlife. The main management concern for wetland wildlife habitat is controlling water levels. Habitat for openland and woodland wildlife can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

This Mowata soil is in capability subclass IIIw. The woodland ordination symbol is 9W.

MwA—Mowata-Vidrine silt loams. These level soils are poorly drained to moderately well drained. They are on broad flats on terraces of the Gulf Coast Prairies. This complex consists of small areas of Mowata and Vidrine soils that are so intermingled that they cannot be mapped separately at the scale selected. The Mowata soil is subject to rare flooding. Areas are irregular in shape and mostly range from 40 to 2,000 acres. A few areas are as large as 5,000 acres. The landscape consists of broad flats that contain many small convex mounds. However, most of the mounds have been smoothed. The mounds are circular and range from 50 to 150 feet across and 1 foot to 6 feet high before leveling. The mapped areas have about 60 percent Mowata soil and about 30 percent Vidrine soil. The Mowata soil is in the intermound areas, and the Vidrine soil is on the mounds or smoothed mound areas. The Mowata soil has slopes less than 1 percent, and the Vidrine soil has slopes of 0 to 1 percent.

The Mowata soil is poorly drained. Typically, it has a surface layer of grayish brown silt loam about 7 inches thick. The subsurface layer is grayish brown silt loam about 11 inches thick. It extends into the next layer. The upper part of the subsoil from a depth of 18 to 27 inches is grayish brown, mottled silty clay that is mixed with grayish brown silt loam. The lower part of the subsoil to a depth of 62 inches is grayish brown and light brownish gray, mottled silty clay.

This Mowata soil has medium fertility. Water and air move through this soil at a very slow rate. Runoff is very low. A seasonal high water table fluctuates between a depth of 2 feet and the soil surface during December through April. This soil is subject to rare flooding for brief periods during unusually wet periods. The surface layer remains wet for long periods after heavy rain. This soil has a high shrink-swell potential.

The Vidrine soil is moderately well drained and somewhat poorly drained. Typically, it has a surface layer of grayish brown silt loam about 7 inches thick. The subsoil extends to a depth of about 62 inches. It is pale brown, mottled silt loam in the upper part; light brownish gray, mottled silty clay that is mixed with pale brown silt loam in the next part; and gray, mottled silty clay loam in the lower part. In places, the slope ranges from 1 to 3 percent.

This Vidrine soil has medium fertility. Water and air move through this soil at a slow rate. Runoff is low; however, it is medium where mounds have not been smoothed. The surface layer of this soil remains wet for long periods after heavy rain. A seasonal high water table is perched on the subsoil at a depth of 1 to 2 feet during December through April. Where the mounds have been smoothed, the water table fluctuates between a depth near the surface and 1 foot below the surface. The shrink-swell potential is high in the lower part of the subsoil.

Included in this map unit are a few small areas of Crowley, Kaplan, Leton, Midland, and Morey soils. The Crowley soils are on side slopes and convex ridges and have an abrupt change in texture from the subsurface layer to the subsoil. The Kaplan soils are on slightly convex ridges. They have red mottles in the upper part of the subsoil and are alkaline in the lower part of the subsoil. The Leton soils are similar to the Mowata soil, except that they are on lower positions and have a loamy subsoil. The Midland soils are lower on the landscape than the Mowata soil. They are similar to the Mowata soil, except that they

Figure 10.—Rice stubble in an area of Mowata-Vidrine silt loams increases the content of organic matter and provides food for wintering waterfowl.

do not have a subsurface layer that extends into the subsoil. The Morey soils are in landscape positions similar to those of the Mowata soil, and they have a very dark gray surface layer. Included soils make up about 10 percent of the map unit.

These soils are mainly used as cropland or woodland. A few areas are used as pasture or homesites.

The soils in this map unit are moderately well suited to cultivated crops, mainly rice and soybeans. The main limitations are wetness and potentially toxic levels of exchangeable aluminum within the root zone. Medium fertility is a minor limitation. These soils are friable, but they are somewhat difficult to keep in good tilth because the surface tends to crust. Also, a tillage pan forms easily if this soil is tilled when wet. Chiseling or subsoiling can be used to break up the tillage pan. Drainage can improve these soils for most cultivated crops. Land grading and smoothing can improve surface drainage and permit more efficient use of farm equipment. Pipe or other drop structures can be installed in drainage ditches to control the water level in rice fields and to prevent excessive erosion of ditches. The organic matter content can be maintained by using all crop residue, plowing under cover crops, and using a suitable cropping system (fig. 10). Most crops and pasture plants respond well to additions of fertilizer and lime, which improve fertility and reduce the level of exchangeable aluminum.

These soils are moderately well suited to woodland. Wetness severely limits the use of equipment, increases the risk of soil compaction, and causes slight to moderate seedling mortality. Also, plant competition is severe. Reforestation after harvesting can be carefully managed to reduce competition from undesirable understory plants. These soils may be compacted if they are wet when heavy equipment is used. Scheduling site preparation and harvesting during drier periods can overcome this limitation. Suitable trees to plant are loblolly pine, slash pine, water oak, and green ash. Also, cherrybark oak can be planted on the Vidrine soil.

The soils in this map unit are moderately well suited to pasture. The main limitation is wetness. Medium fertility is a minor limitation. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, wild winter peas, and white clover. Grazing when the soil is wet compacts the surface layer. Proper grazing, weed control, and fertilizer applications are needed for maximum quality of forage.

These soils are poorly suited to urban development. The main limitations are wetness, the high shrink-swell potential, the slow or very slow permeability, and low strength on sites for local roads and streets. Flooding is a hazard on sites for dwellings and small commercial buildings. Drainage can improve these soils for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. The design of roads can offset the limited ability of the soil to support a load. Buildings and roads can be designed to offset the effects of the shrinking and swelling. The very slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, sewage lagoons or self-contained absorption units can be used to dispose of sewage properly. Buildings can be placed on pilings or mounds to raise them above the expected flood elevations. Flooding can be controlled by levees, diversions, and water pumps.

The soils in this map unit are poorly suited to recreational development. The main limitations are wetness and the slow or very slow permeability. In the Mowata soils, flooding is a hazard on sites for camp areas. Drainage can improve these soils for most recreational uses. Flooding can be controlled with levees, diversions, and water pumps.

The Mowata soil in this map unit is well suited to use as habitat for wetland wildlife and moderately well suited to use as habitat for openland and woodland wildlife. The Vidrine soils are well suited to use as habitat for openland and woodland wildlife and moderately well suited to use as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. Constructing shallow ponds to provide open water areas improves the habitat for waterfowl and furbearers.

The Mowata and Vidrine soils in this map unit are in capability subclass IIIw. The woodland ordination symbol is 9W.

PnB—Pineisland loam, 1 to 3 percent slopes. This is a very gently sloping, moderately well drained soil on terraces of the Gulf Coast Prairies. It is on side slopes of relict natural levees along abandoned stream channels. Areas are long and narrow and range from 40 to 250 acres.

Typically, the surface layer is dark grayish brown, mottled loam about 9 inches thick. The subsurface layer is dark yellowish brown loam about 6 inches thick. It extends downward into the next layers. The subsoil extends to a depth of 78 inches. From a depth of 15 to 24 inches it is yellowish brown loam and dark brown clay loam; from a depth of 24 to 38 inches it is brownish yellow clay loam that is mixed with yellowish brown silt loam; from a depth of 38 to 48 inches it is a dense, brittle layer that is reddish yellow and yellow clay loam; and from a depth of 48 to 78 inches it is red, mottled sandy clay loam. In places, the subsoil is clayey.

Included in this map unit are a few small areas of Crowley, Leton, and Mowata soils. The Crowley and Mowata soils are slightly lower on the landscape than the Pineisland soil and have a loamy and clayey subsoil. The Leton soils are in lower positions, are poorly drained, and do not have a dense, brittle layer. The included soils make up about 10 percent of the map unit.

This soil is low in fertility and has moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderately slow rate. Runoff is medium. A seasonal high water table is perched on the dense, brittle layer at a depth of about 2 to 3 feet during December through March. The rooting depth is restricted by this layer. The soil has a low shrink-swell potential.

This Pineisland soil is mainly used as cropland. A few areas are used as pasture or homesites.

This soil is moderately well suited to cultivated crops. The main limitations are the slope, low fertility, potentially toxic levels of exchangeable aluminum, and the restricted rooting depth. Erosion is the main hazard. Soybeans, wheat, and rice are the main crops grown. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by subsoiling when the soil is dry. Maintaining crop residue on or near the surface helps to control runoff, conserve moisture, and maintain soil tilth and organic matter content. Erosion can be controlled by farming on the contour, seeding fall grain early, and using stubble-mulch tillage. Also, waterways can be constructed and seeded to perennial grass. Most crops respond well to applications of fertilizer and lime, which improve fertility and reduce the level of exchangeable aluminum.

This soil is well suited to pasture. The main limitation is low fertility. Erosion is a hazard. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, white clover, wild winter peas, and vetch. A seedbed should be prepared on the contour or across the slope where practical. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff. Proper grazing, weed control, and fertilizer applications are needed for maximum quality of forage.

This Pineisland soil is well suited to woodland. The main concern in producing and harvesting timber is the limited rooting depth, which may reduce the productivity of this soil for taprooted trees. Also, competition from understory plants is severe. Site preparation controls initial plant competition and spraying controls subsequent growth. Suitable trees to plant are loblolly pine, shumard oak, sweetgum, and water oak.

This soil is poorly suited to urban development. The main limitations are wetness, the moderately slow permeability, and low strength on sites for local roads and streets. Septic tank absorption fields do not function properly during rainy periods because of wetness and the moderately slow permeability. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. The design of roads can offset the limited ability of the soil to support a load.

This Pineisland soil is poorly suited to recreational development. The main limitation is wetness. Excess water can be removed by shallow ditches and by providing the proper grade.

This soil is well suited to use as habitat for openland wildlife species, such as rabbits, doves, quail and songbirds. Habitat can be improved by planting appropriate vegetation, by maintaining existing plant cover, or by promoting the natural establishment of desirable plants. Planting a diversity of crops in narrow strips and leaving crop residue on the surface over winter also improves the habitat for openland wildlife.

This Pineisland soil is in capability subclass IIe. The woodland ordination symbol is 8D.

Pt—Pits, sand and gravel. This map unit consists of excavations from which soil and geologic material have been removed, mainly for use in road construction. Pits generally range from 2 to 1,500 acres.

Included in mapping are a few small areas of spoil material, mostly mixtures of loamy and clayey material, that have been piled or scattered around the edges of the pits. Also included are small bodies of shallow water. The included areas make up about 10 percent of the map unit.

Pits are generally not suited to agricultural, forestry, or urban uses (fig. 11). When left undisturbed, abandoned pits can produce habitat for rabbits and other small game animals .

VnB—Vidrine silt loam, 1 to 3 percent slopes. This very gently sloping soil is moderately well drained and somewhat poorly drained and is on terraces of the Gulf Coast Prairies. It is on side slopes of relict natural levees along abandoned stream channels. Areas are long and narrow and range from 40 to 250 acres.

Typically, the surface layer is dark brown silt loam about 11 inches thick. The subsoil extends to a depth of 60 inches or more. It is brown and light yellowish brown, mottled silt loam in the upper part; grayish brown silty clay that is mixed with pale brown, mottled silt loam in the next part; and grayish brown and light brownish gray, mottled silty clay in the lower part.

Included in this map unit are a few small areas of Crowley, Leton, and Pineisland soils. The Crowley soils are on broad convex ridges and on side slopes of broad ridges and have an abrupt change in texture from the subsurface layer to the subsoil. The Leton soils are in lower landscape positions and are loamy throughout. The Pineisland soils are in slightly higher positions and are loamy throughout. The included soils make up about 10 percent of the map unit.

This soil has medium fertility. Water and air move through this soil at a slow rate. Runoff is medium. A seasonal high water table is perched on the subsoil at a depth of about 1 to 2 feet during December through April. This soil has a high shrink-swell potential.

This Vidrine soil is mainly used as cropland. A few areas are used as pasture or homesites.

Figure 11.—Sand for use in construction was moved from this area of Pits, sand and gravel. Unless it is adequately reclaimed by leveling, this area is not suited to most other uses.

This soil is moderately well suited to cultivated crops, mainly soybeans and rice. Medium fertility is a minor limitation and erosion is a hazard. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by subsoiling when the soil is dry. Maintaining crop residue on or near the surface helps to control runoff and maintain soil tilth and organic matter content. The hazard of erosion can be reduced if fall grain is seeded early, stubble-mulch tillage is used, and tillage and seeding are on the contour or across the slope. Waterways that are shaped and seeded to perennial grass can help to reduce erosion.

This Vidrine soil is well suited to pasture. Wetness and medium fertility are the main limitations. Erosion can be a hazard if the soil is left bare over winter. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, white clover, wild winter peas, and vetch. A seedbed should be prepared on the contour or across the slope where practical. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff. Proper grazing, weed control, and fertilizer applications are needed for maximum quality of forage.

This soil is moderately well suited to woodland; however, most areas are in cropland and will not likely be used for commercial wood production. The native vegetation was tall prairie grasses. If this soil is used as woodland, the main management concerns are the equipment limitation caused by wetness and competition from understory plants. Conventional methods of harvesting generally are suitable, but the soil can be compacted if it is wet when heavy equipment is used. Site preparation controls initial plant competition, and spraying controls subsequent growth. Suitable trees to plant are loblolly pine, slash pine, water oak, cherrybark oak, and green ash.

This Vidrine soil is poorly suited to urban development. The main limitations are the high shrink-swell potential, wetness, the slow permeability, and low strength on sites for local roads and streets. Septic tank absorption fields do not function properly during rainy periods because of wetness and the slow permeability. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. Buildings and roads can be designed to offset the effects of shrinking and swelling. Roads also can be designed to offset the limited ability of the soil to support a load. Excess surface water can be removed by shallow ditches and by providing the proper grade.

This soil is poorly suited to recreational development. The main limitations are wetness and the slow permeability. Drainage can be improved by shallow ditches and by providing the proper grade.

This soil is well suited to use as habitat for openland and woodland wildlife. It is moderately well suited to use as habitat for wetland wildlife. Habitat can be improved by planting appropriate vegetation, by maintaining existing plant cover, or by promoting the natural establishment of desirable plants.

This Vidrine soil is in capability subclass IIe. The woodland ordination symbol is 9W.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, and an acceptable salt and sodium content. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

The map units in Jefferson Davis Parish that are considered prime farmland are listed at the end of 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 5. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading “Detailed Soil Map Units.”

Soils that have limitations, such as a high water table or flooding, may qualify as prime farmland if these limitations are overcome by such measures as drainage or flood control. In the following list, the measures needed to overcome the limitations of a map unit, if any, are shown in parentheses after the map unit name. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by the corrective measures.

The map units that meet the requirements for prime farmland are:

AcB Acadia silt loam, 1 to 3 percent slopes (if adequately drained)
CdA Caddo-Messer silt loams (if adequately drained)
ChB Cahaba fine sandy loam, 1 to 3 percent slopes
CrA Crowley-Vidrine silt loams, 0 to 1 percent slopes (if adequately drained)
CrB Crowley-Vidrine silt loams, 1 to 3 percent slopes (if adequately drained)
GnB Glenmora silt loam, 1 to 3 percent slopes
JdA Judice silty clay (if adequately drained)
KpA Kaplan silt loam, 0 to 1 percent slopes (if adequately drained)
KpB Kaplan silt loam, 1 to 3 percent slopes (if adequately drained)
KrA Kinder-Messer silt loams (if adequately drained)
LeA Leton silt loam (if adequately drained)
MdA Midland silt loam (if adequately drained)
MoA Morey loam (if adequately drained)
MtA Mowata silt loam (if adequately drained)
MwA Mowata-Vidrine silt loams (if adequately drained)
PnB Pineisland loam, 1 to 3 percent slopes
VnB Vidrine silt loam, 1 to 3 percent slopes

Use and Management of the Soils

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

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral 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 rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the suitabilities 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 nature.

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

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

Crops and Pasture

About 295,000 acres in Jefferson Davis Parish was used for crops, pasture, and rangeland in 1997. About 253,000 acres was used for crops, mainly rice and soybeans; and about 42,000 acres for improved pasture and rangeland.

Crop suitability and management needs are based on soil characteristics, such as fertility level, erodibility, organic matter content, availability of water for plants, drainage, and flooding hazard. Each farm has a unique soil pattern; therefore, each has unique management problems. Some principles of farm management, however, apply to specific soils and certain crops.

General management needed for crops and pasture is suggested in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained. The estimated yields of the main crops and hay and pasture plants are listed for each soil in table 6.

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

Pasture and Hayland

Perennial grasses or legumes, or mixtures of these, are grown for pasture and hay. The mixtures generally consist of a summer perennial grass and a suitable legume. Also, many farmers seed small grain or ryegrass in the fall for winter and spring forage. Excess grass in summer is harvested as hay for the winter.

Common and improved bermudagrass and Pensacola bahiagrass are the summer perennials most commonly grown (fig. 12). Improved bermudagrass and Pensacola bahiagrass produce good quality forage. These grasses respond well to applications of fertilizer, particularly nitrogen.

White clover is the most common legume, and it responds well to liming, particularly on acid soils.

Proper grazing, brush and weed control, fertilizer, lime, and pasture renovation are essential for high quality forage, stand survival, and erosion control.

Figure 12.—Pensacola bahiagrass provides good forage for grazing cattle in this area of Kaplan silt loam, 0 to 1 percent slopes.

Grazing livestock on the native understory plants in woodland helps farmers obtain additional forage. Forage volume varies with the woodland site, the condition of the native forage, and the density of the timber stand. Although most woodland is managed mainly for timber, substantial volumes of forage are obtainable from those areas under good management. Stocking rates and grazing periods need to be carefully managed for optimum forage production. Maintaining an adequate cover of understory plants helps to control erosion.

Grazing livestock on the native vegetation in areas of marshland, which are adjacent to improved pastures at higher elevation, helps farmers obtain additional forage. Although the type and amount of vegetation varies with the site, most sites provide large volumes of high quality forage. Cattle can graze only those soils in the marsh that are firm enough to support their weight. Insects and the availability of shelters are the main management concerns. Stocking rates and grazing periods need to be properly managed in order to maintain good quality range.

Fertilization and Liming

The soils of Jefferson Davis Parish range from extremely acid to slightly acid in the surface layer. Most soils that are used for crops are low in organic matter content and in available nitrogen. Most of the soils generally need lime and a complete fertilizer for crops and pasture plants. The amount of fertilizer needed depends on the kind of crop to be grown, on past cropping history, on the level of yield desired, and on the kind of soil. Amounts should be determined on the basis of soil test results. Information and instructions on collecting and testing soil samples can be obtained from the Cooperative Extension Service.

Organic Matter Content

Organic matter is an important source of nitrogen for crop growth. It also increases the rate of water intake, reduces surface crusting, and improves tilth. Most soils of the parish that are used for crops are low in organic matter content. The level of organic matter can be maintained by growing crops that produce an extensive root system and an abundance of foliage, by leaving plant residue on the surface, by growing perennial grasses and legumes in rotation with other crops, and by adding barnyard manure. Residue from rice straw helps to maintain the organic matter content of the soils.

Soil Tillage

Soil should be tilled only enough to prepare a seedbed and to control weeds. Excessive tillage commonly destroys soil structure. The clayey soils in the parish become cloddy if cultivated when they are too wet or too dry. A compacted layer, generally known as a trafficpan or plowpan, often develops just below the plow layer in loamy soils. Where rice is grown in loamy soils, farmers intentionally create a plowpan. This is done to prevent ponded irrigation water from infiltrating into soil layers below the root zone. For crops other than rice, however, a plowpan is undesirable, because it limits rooting depth and the amount of moisture available to crops. Plowpans can be avoided by plowing when the soil is dry or by varying the depth of plowing. If a compacted layer does develop, it can be broken up by subsoiling or chiseling. Tillage implements that stir the surface and leave crop residue in place protect the soil from high intensity rains, thereby helping to control erosion, reduce runoff, increase infiltration, reduce surface crusting, and ensure good seed germination.

Drainage

Most of the soils in the parish need surface drainage to make them more suitable for growing crops. The soils in high landscape positions are drained by a gravity drainage system consisting of row drains and field drains. The soils in low positions are drained by a gravity drainage system consisting of a series of mains, or principal ditches, and laterals, or smaller drains that branch out from them. The success of the systems depends on the availability of adequate outlets. Drainage is also improved by land grading, water leveling, or precisely leveling the field to a uniform grade (fig. 13). Land grading improves surface drainage, eliminates cross ditches, and creates larger and more uniformly shaped fields that are more suited to the use of modern, multirow farm machinery. However, deep cutting of soils that have unfavorable subsoil characteristics should be avoided.

Water for Plant Growth

The available water capacity of the soils in the parish ranges from low to very high, but, in many years, sufficient water is not available at the critical time for optimum growth unless irrigation water is provided. There are large amounts of rainfall in winter and spring. Generally there is sufficient rain in summer and fall of most years. However, on some soil areas, plants do not have adequate water during dry periods in summer and fall.

Cropping Sequence

A good cropping sequence includes a legume for nitrogen, a cultivated crop to aid in weed control, a deep-rooted crop to utilize substratum fertility and maintain substratum permeability, and a close-growing crop to help maintain the organic matter content. The crop sequence should cover the soil as much of the year as possible.

In Jefferson Davis Parish, a variety of cropping sequences is used, depending upon the main crop grown. Rice is commonly rotated with soybeans or pasture. Grass or legume cover crops are commonly grown during the fall and winter. In many places, rice fields are used to produce crawfish in the winter (fig. 14).

Control of Erosion

Soil erosion generally is not a serious problem on most of the soils in Jefferson Davis Parish, mainly because most of the topography is level to nearly level. Nevertheless, sheet and gully erosion can be moderately severe in fallow-plowed fields, newly constructed drainage ditches, and on ridges and mounds in undulating areas. Some gullies tend to form at overfalls into drainage ditches. New drainage ditches should be seeded immediately after construction.

Erosion is a hazard on some of the sloping soils left without plant cover for extended periods. If the surface layer is lost through erosion, most of the available plant nutrients and the organic matter are also lost. Soil erosion also results in sedimentation of drainage systems; and streams are polluted by sediments, nutrients, and pesticides.

Cropping sequences that maintain a plant cover on the soil for extended periods reduce soil erosion. Use of legume or grass cover crops helps to control erosion, increases the content of organic matter and nitrogen in the soils, and improves tilth. Constructing terraces, diversions, and grassed waterways; using

Figure 13.—Water leveling for irrigation water management on Kinder-Messer silt loams is a common cultural practice for growing rice.

minimum tillage; farming on the contour; and using cropping sequences that rotate grass or close-growing crops with row crops help to control erosion on cropland and pasture. Constructing pipe drop structures in drainageways to drop water to different levels can help to prevent gullying.

Additional information on erosion control, cropping sequences, and drainage practices can be obtained from the local office of the Natural Resources Conservation Service and the Cooperative Extension Service, or from the Louisiana Agricultural Experiment Station.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

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

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

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

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

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for

Figure 14.—Crawfish are produced in this area of Kinder-Messer silt loams. The slow permeability of the soils makes them suited to this use.

interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

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

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

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

Woodland Management and Productivity

Carl V. Thompson Jr., state staff forester, Natural Resources Conservation Service, helped prepare this section.

This section provides information on the relation between trees and their environment, in particular, trees and the soils in which they grow. It includes information on the kind, amount, and condition of woodland resources in Jefferson Davis Parish. In addition, this section provides soil interpretations for owners of woodland and for foresters, forest managers, and agricultural workers to help plan the use of soils for wood crops.

Soils directly influence the growth, management, harvesting, and multiple uses of forests. Soil is the medium in which a tree is anchored and from which it draws nutrients and moisture. Soil characteristics, such as chemical composition, texture, structure, and depth, affect tree growth, seedling survival, species adaptability, and equipment use.

The ability of a soil to supply moisture and nutrients to trees is strongly related to its texture, structure, and depth. Generally, sandy soils, such as the Bienville soils, are less fertile and have lower water-holding capacity than clayey soils, such as the Gore soils. However, aeration is often impeded in clayey soils, particularly under wet conditions.

These soil characteristics, in combination, largely determine the forest stand species composition and influence management and utilization decisions. Sweetgum, for example, is tolerant of many soils and sites, but grows best on the rich, moist, alluvial loamy soils of bottom lands. Use of heavy logging and site-preparation equipment is more restricted on clayey soils than on better drained sandy or loamy soils.

Woodland Resources

The topography and vegetation of Jefferson Davis Parish varies from pine forests in the northwest to freshwater marsh in the south. The dominant trees are: longleaf pine, slash pine, and loblolly pine on higher positions; sweetgum, red oak, white oak, elm, pecan, green ash, sycamore, and cottonwood on stream bottoms and river bottoms; and baldcypress and tupelo-gum in swamps.

The pine forest in the northwestern part of the parish was once a vast virgin forest. Around the turn of the century, this forest was clearcut and maintained as open range by regular burning until the late 1940's and early 1950's. At that time, effective

Figure 15.—An area of Kinder-Messer silt loams that is planted to slash pine.

fire protection was provided by the Louisiana Office of Forestry (then known as the Louisiana Forestry Commission). In addition, the Office of Forestry increased operations of their pine seedling nurseries, thus making pine seedlings more readily available for planting the cutover land. Finally, timber and land values began to increase, thus providing an incentive to landowners to bring their property into production. Today, some of the land in the parish which was once forest land is again in pine production (fig. 15).

Jefferson Davis Parish has about 50,500 acres of commercial forest land, or 12 percent of the total area of the parish (25). Commercial forest land is defined as land producing or capable of producing crops of industrial wood and not withdrawn from timber use. Land that is withdrawn from this use is converted to cropland, urban land, power transmission and transportation corridors, and pastureland. The ownership of forest land in Jefferson Davis Parish is 33 percent corporate and 67 percent private land.

The parish is composed of three major land resource areas (MLRA's). These are the Western Gulf Coast Flatwoods, the Gulf Coast Prairies, and the Gulf Coast Marsh. The Western Gulf Coast Flatwoods MLRA and the Gulf Coast Prairies MLRA support small acreages of commercial forest. The Gulf Coast Marsh MLRA is completely devoid of commercial forest.

The dominant tree species in the Western Gulf Coast Flatwoods are loblolly pine, slash pine, longleaf pine, sweetgum, water oak, southern red oak, white oak, american sycamore, and magnolia in the better drained soils in higher positions; and eastern cottonwood, green ash, white oak, cherrybark oak, nuttall oak, water oak, willow oak, american sycamore, and water tupelo in poorly drained soils in lower positions.

The dominant trees species in the Gulf Coast Prairies are sweetgum, slash pine, loblolly pine, water oak, southern red oak, white oak, blackgum, and green ash in better drained soils in higher positions; and green ash, white oak, cherrybark oak, nuttall oak, water oak, willow oak, american sycamore, and water tupelo in poorly drained soils in lower positions.

Commercial forests can be further divided into forest types based on tree species, site quality, or age. In this survey, forest types are stands of trees that have similar characteristics and species and that grow under the same ecological and biological conditions. These forest types are named for the trees that predominate.

The oak-pine forest type covers 34 percent of the forest land in Jefferson Davis Parish. In this forest type, 50 to 70 percent of the stocking is hardwoods (generally upland oaks) and 25 to 50 percent of the stocking is softwoods (except baldcypress). The composition of the tree species is primarily influenced by the type of soil. On the higher, drier areas the hardwood components tend to be upland oaks, such as post oak, southern red oak, and blackjack oak. In the moister, more fertile areas they are white oak, southern red oak, and black oak. Blackgum, winged elm, red maple, and various hickory species are associated with this forest type on both of these broad site classifications.

The oak-gum-cypress forest type covers 22 percent of the forest land area in the parish (25). This type has bottom-land forests of water tupelo, blackgum, sweetgum, willow oak, and baldcypress, either singularly or in combination. Associated trees include cottonwood, black willow, green ash, sugarberry, red maple, and elm.

The loblolly pine-shortleaf pine forest type covers 22 percent of the forest land in the parish. Loblolly pine is generally dominant, except on drier sites. Scattered hardwoods can be mixed with pines in the overstory. Sweetgum, blackgum, southern red oak, post oak, white oak, mockernut hickory, and pignut hickory are on somewhat excessively drained and well drained soils. Sweetgum, red maple, water oak, and willow oak are in moister areas. American beech and green ash are generally associated with this forest type on fertile, well drained coves and along stream bottoms.

The oak-hickory forest type covers 11 percent of the forest land in the parish. This type of forest cover is one in which upland oaks or hickory, either singly or in combination, cover a majority of the stocking. Where pines cover 25 to 50 percent, the stand would then be classified as oak-pine. Elm and maple are common associates.

The longleaf pine-slash pine type covers 11 percent of the forest land in the parish. This type of forest cover is one in which 50 percent or more of the stand is longleaf pine or slash pine, either singly or in combination. Oak, gum, and other southern pines are common associates.

The forest land in Jefferson Davis Parish, by physiographic class, is 52 percent pine and 48 percent bottom-land hardwoods (25).

The marketable timber volume is composed of about 59 percent pine and 41 percent hardwoods. The forest acreage is 89 percent sawtimber and 11 percent saplings and seedlings. An insignificant acreage of forest land is classified as pole timber and as “nonstocked areas.” Productivity of forest land can be measured by the amount of cubic feet of wood produced per acre per year. Most of the more productive sites are in pasture or cropland. However, forest land in Jefferson Davis Parish is fairly productive, with about 11 percent producing 165 cubic feet or more of wood, 45 percent producing 120 to 165 cubic feet, 33 percent producing 85 to 120 cubic feet, less than 1 percent producing 50 to 85 cubic feet, and 11 percent producing less than 50 cubic feet (25).

Most of the upland pine forest type areas are privately owned. These privately owned tracts and most of the bottom-land tracts produce well below their potential. Most of these tracts would benefit if stands were improved by thinning out mature trees and undesirable species. Tree planting, timber stand improvement, and protection from grazing, fire, insects, and diseases are needed.

The Natural Resources Conservation Service, Louisiana Office of Forestry, and the Louisiana Cooperative Extension Service can help determine specific woodland management needs.

Production of Forage in Woodland

The kind and amount of understory vegetation that can be produced in an area is related to the soils, climate, and amount of tree overstory. In many pine woodlands, cattle grazing can be a compatible secondary use. Grazing is not recommended on hardwood woodlands. The grasses, legumes, forbs, and much of the woody browse in the understory are grazable if properly managed to supplement a woodland enterprise without damage to the wood crop. In fact, on most pine woodlands, grazing is beneficial to the woodland program because it reduces the accumulation of heavy “rough,” thus reducing the hazard of wildfires. Grazing also helps to suppress undesirable woody plants. The success of a combined woodland and livestock program depends primarily on the degree and time of grazing of the forage plants. Intensity of grazing must be such that adequate cover for soil protection can be maintained and the quantity and quality of trees and forage vegetation can be maintained or improved.

Forage production varies according to the type of woodland and the amount of sunlight that reaches the understory vegetation during the growing season.

Soils that have similar potential to produce trees also have similar potential for producing about the same kind and amount of understory vegetation. Vegetation on these soils will reproduce as long as the environment does not change.

Research has proven a close correlation between the total potential yield of grasses, legumes, and forbs growing in similar soils and the amount of sunlight reaching the ground at midday. Herbage production declines as the forest canopy becomes more dense.

The main objective in good woodland grazing management is to keep the woodland forage in excellent condition. This conserves water, improves yields, and protects the soils.

Production of Timber in Woodland

This soil survey can be used by woodland owners or managers in planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section “Detailed Soil Map Units,” the description of each map unit in the survey area suitable for timber includes information about limitations in harvesting timber and management concerns in producing timber. Table 7 summarizes forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Table 7 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species based on its site index. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation affecting use and management. The letter W indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *D* indicates a soil that has a limitation because of restricted rooting depth, such as a shallow soil that is underlain by a hardpan or other layers that restrict roots. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the profile. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is as follows: W, D, C, and S.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as wetness or texture of the surface layer. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if wetness restricts equipment use from 2 to 6 months per year; if a sandy or clayey surface layer restricts the use of ground-based equipment; or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if wetness restricts equipment use for more than 6 months per year; if the surface layer is loose sand that severely restricts the use of ground-based equipment; or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

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

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition is more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants hinders adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants hinders natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A moderate or severe rating indicates the need for site preparation to control plant competition and ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and as a *productivity class*. Common trees that have a commercial value are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

The soils that are commonly used to produce timber have the yield predicted in cubic feet and board feet. The yield is predicted at the point where mean annual increment culminates.

The *site index* is determined by taking height measurements and determining the age of dominant and codominant trees within stands of a given species. The index is the average height, in feet, that the trees attain in a specified number of years. This number is 50 years for all trees except for cottonwood, for which it is 30 years, and American sycamore, for which it is 35 years. The site index applies to fully stocked, even-aged, unmanaged stands.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic meters per hectare per year. Cubic meters per hectare can be converted to cubic feet per acre by multiplying by 14.3. It can be converted to board feet by multiplying by a factor of about 71. For example, a productivity class of 8 means that the soil can be expected to produce 114 cubic feet per acre per year at the point where mean annual increment culminates, or about 568 board feet per acre per year.

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

Recreation

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface absorbs rainfall readily but remains firm and is not dusty when dry.

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 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 firm after rains and is not dusty when dry. If grading is needed, the depth of the soil over a hardpan should be considered.

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

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. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Rick Simmering, biologist, Natural Resources Conservation Service, helped prepare this section.

Habitat for wildlife in Jefferson Davis Parish is provided by openland (cropland or pasture), canal banks, forest land, and marsh.

The open agricultural lands provide fair habitat for resident small game species, such as rabbits and bobwhite quail. The shortage of cover in cropland and pasture is the main limiting factor. Nonresident species, such as ducks, geese, and mourning doves, use openland habitat heavily as winter feeding grounds, particularly where rice stubble is left after harvest. In addition, winter wheat is a favored food for wintering geese.

The shrubs, trees, and grasses growing on the spoil banks of the many drainage channels and irrigation canals in the parish provide food and cover for upland game species. These species include bobwhite quail, cottontail and swamp rabbits, and other wildlife, such as rodents, song birds, and predators.

Forest-land habitat consists of pines or mixed pines and hardwoods on terraces; bottom-land hardwoods; and wooded swamps.

Most of the pine or mixed pine and hardwood forest land is on terraces in the northwest corner of the parish adjacent to the Calcasieu River. Other small blocks of pine trees are scattered throughout the parish. Bottom-land hardwoods are on the flood plains along the larger streams and rivers. Wooded swamps are semi-permanently flooded stands of baldcypress and water tupelo trees. The swamps are mainly in the lower reaches of Bayou Lacassine and Bayou Nezpique.

The larger stands of pines or mixed pines and hardwoods support moderate to high populations of wild turkey, white-tailed deer, bobwhite quail, and cottontail rabbits.

The bottom-land hardwoods and wooded swamps are favored by both resident and migratory waterfowl and by wading birds. Furbearers, such as mink, nutria, raccoon, otter, and beaver, and crustaceans and reptiles also thrive there.

The marshland in the southernmost part of the parish provides very productive habitat for many species of water birds, mammals, fish, and reptiles (fig. 16). In the marsh, alligator populations are high. Nutria, mink, otter, and raccoon find an abundance of food and cover in this habitat.

Many estuarine organisms (shrimp, menhaden, crabs, etc.) depend on the marsh as a nursery until they become adults and return to salt water. These organisms, in turn, are a source of food for higher predatory forms of life, such as largemouth bass, otter, mink, and wading birds.

The marsh also is an important wintering ground for waterfowl of the Mississippi and Central migratory flyways. Ducks and geese feed heavily on the seeds, roots, and tubers produced by the marsh vegetation.

The best fisheries resources in the parish are in Lake Arthur, Bayou Lacassine, and the marsh. Good quality fishing is available in these areas. Bayou Nezpique, the Mermentau River, and the Calcasieu River provide secondary fisheries resources.

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

In table 9, the soils 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

Figure 16.—Maidencane in an area of Allemands muck, a soil that provides habitat for wetland wildlife.

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, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and rice.

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, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, bahiagrass, bermudagrass, clover, and wild winter peas.

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, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, paspalum, and uniola.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, sugarberry, sweetgum, persimmon, hawthorn, dogwood, hickory, blackberry, and huckleberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are tree-huckleberry and redbay.

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

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 American beautyberry, waxmyrtle, American elder, and sumac.

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, and slope. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are wetness, 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, meadowlark, field sparrow, cottontail, and red fox.

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

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

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the “Soil Properties” section.

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

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

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

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

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

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

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

Building Site Development

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

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

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements 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, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

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

Sanitary Facilities

Table 11 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome;

moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfill. 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 60 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, and flooding affect absorption of the effluent.

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

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

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

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity.

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 should be considered.

The ratings in table 11 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, highly organic layers, and soil reaction affect trench 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 sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture and wetness affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of 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 wind erosion.

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

Construction Materials

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

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

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

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by a high water table. 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 and a low shrink-swell potential. 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 a moderate shrink-swell potential. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10 and a high shrink-swell potential. They are wet and have a water table at a depth of 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. They are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick. All other soils are rated as an improbable source.

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

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

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are naturally fertile or respond well to fertilizer and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, and soils that have only 20 to 40 inches of suitable material. 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, or have a seasonal high water table at or near the surface.

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

Water Management

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

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

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 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 and permeability of the aquifer.

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 layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by 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. Availability of drainage outlets is not considered in the ratings.

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

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion 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. Wetness and slope affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances, 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 17.

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 to characterize key soils.

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

Engineering Index Properties

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

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading “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. Textural terms are defined in the “Glossary.”

Classification of the soils is determined according to the Unified soil classification system *(3)* and the system adopted by the American Association of State Highway and Transportation Officials *(2)*.

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

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

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 17.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight.

The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

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

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

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

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

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

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

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

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

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

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

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 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, 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 and very 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 to very 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 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 is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Table 16 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, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). *Common* is used when the occasional and frequent classes are grouped for certain purposes. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

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 little or no horizon development.

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 estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. “More than 6.0” indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

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

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

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

Engineering Index Test Data

Table 17 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section “Soil Series and Their Morphology.” The soil samples were tested by the Louisiana Department of Highways.

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).

Soil Fertility Levels

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This section contains information on both the environmental factors and the physical and chemical properties of the soils that affect their potential for crop production. It also lists the analytical methods that were used to determine the chemical properties of the sampled soils.

Factors Affecting Crop Production

Crop composition and yield are a function of many environmental, plant, and soil factors. The environmental factors include light (intensity and duration), temperature of the air and soil, precipitation (distribution and amount), and atmospheric carbon dioxide concentration.

Plant factors are species and hybrid specific. They include the rate of nutrient and water uptake and the rate of plant growth and related plant functions.

Soil factors consist of both physical and chemical properties. The physical properties include particle-size distribution, texture, structure, surface area, bulk density, water retention and flow, and aeration. The chemical properties can be separated into quantity factors, intensity factors, relative intensity factors, quantity-intensity relationship factors, and replenishment factors.

The *quantity factor* refers to the amount of an element in the soil that is readily available for uptake by plants. When the quantity factor is ascertained, the available supply of an element is removed from the soil by a suitable extractant and is analyzed.

The *intensity factor* refers to the concentration of an element species in the soil moisture. It is a measure of the availability of an element for uptake by plant roots. The availability of an element to plants differs in two soils that have identical available quantities of the element but have different intensity factors.

The *relative intensity factor* refers to the effect that the availability of one element has on the availability of another element.

The *quantity-intensity relationship factor* refers to the reactions between the soil surface and soil water that control the distribution of element species between the available supply in the soil and the soil water. A special quantity-intensity relationship is the buffer capacity of the soil for a given element. The buffer capacity is the amount of a given element that must be added to or removed from the available supply to produce a given change in the intensity factor for that element.

The *replenishment factor* refers to the rate of replenishment of the available supply and intensity factors by weathering reactions, additions of fertilizer, and transport by mass flow and diffusion.

These soil factors are interdependent. The magnitude of the factors and the interactions among them control crop response. The relative importance of each factor changes from soil to soil, crop to crop, and environment to environment. The soil factors are only part of the overall system.

The goal of soil testing is to provide information for a soil and crop management program that establishes and maintains optimum levels and proportions of the essential elements in the soil for crop and animal nutrition. In addition, the environment is protected against the buildup of potentially toxic levels of essential and nonessential elements. Current soil tests measure only one factor—the available supply of nutrients in the surface layer or plow layer. Where crop production is clearly limited by the available supply of one or more nutrients in the plow layer, existing soil tests generally can diagnose the deficiency and make reliable recommendations to correct the problem. Soil management systems generally are based on physical and chemical alteration of the plow layer. The characteristics of this layer can vary from one location to another, depending on management practices and land use.

The underlying layers are less likely to change, or they change very slowly, as a result of alteration of the plow layer. The properties of the subsoil reflect the soil's inherent ability to supply nutrients to plant roots and to provide a favorable environment for root growth. If soil fertility recommendations based on current soil tests are followed, major fertility deficiencies in the plow layer are normally corrected. Crop production is then limited by crop and environmental factors, the physical properties of the plow layer, and the physical and chemical properties of the subsoil.

Chemical Analysis Methods

The supply of available nutrients in the soil is an important factor affecting crop production. Information about the supply of available nutrients in the subsoil can be used as the basis for an evaluation of the natural fertility level of the soil.

Soils were sampled during the soil survey and analyzed for soil reaction (pH); organic matter content; extractable phosphorus; exchangeable cations of calcium, magnesium, potassium, sodium, aluminum, and hydrogen; total acidity; cation-exchange capacity; and base saturation. The results are summarized in Table 18. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(28)*. More detailed information on chemical analyses of soils is available *(1, 4, 6, 8, 11, 12, 16, 20, 23, 24, 28, 30)*.

Reaction (pH)—1:1 soil/water solution (8Cla).
Organic carbon—acid-dichromate oxidation (6Ala).
Extractable phosphorus—Bray 2 extractant (0.03 molar ammonium fluoride-0.1 molar hydrochloric acid).
Exchangeable bases—pH 7, 1 molar ammonium acetate-calcium (6N2), magnesium (6O2), potassium (6Q2), sodium (6P2).
Exchangeable aluminum and hydrogen—1 molar potassium chloride (6G2).
Total acidity—pH 8.2, barium chloride-triethanolamine (6Hla).
Effective cation-exchange capacity—sum of bases plus exchangeable aluminum and hydrogen (5A3b).
Sum cation-exchange capacity—sum of bases plus total acidity (5A3a).
Base saturation—sum of bases/sum cation-exchange capacity (5C3).
Aluminum saturation—exchangeable aluminum/effective cation-exchange capacity.
Exchangeable sodium percentage—exchangeable sodium/sum cation-exchange capacity.

Characteristics of Soil Fertility

In general, there are four major soil profile types based on soil fertility in the soils of Louisiana. The first type includes soils having a relatively high level of available nutrients throughout the profile. This type reflects the relatively high fertility status of the material from which the soils formed and a relatively young age or limited degree of weathering in the soil profile. Examples are the Gore, Judice, and Kaplan soils.

The second type includes soils in which the level of available nutrients is relatively low in the surface layer but generally increases with increasing depth. These soils have relatively fertile parent material, and they are older than the first type and have been subjected to weathering over a longer period or to more intense weathering. Crops on these soils can exhibit deficiency symptoms early in the growing season if the levels of available nutrients in the surface layer are low. If the crop roots are able to penetrate to the more fertile subsoil, the deficiency symptoms often disappear. The majority of the soils in Jefferson Davis Parish are in this group.

The third type includes soils that have an adequate or relatively high level of available nutrients in the surface layer but a relatively low level in the subsoil. Such soils formed in material that is low in fertility, or they are older soils that have been subject to more intense weathering over a longer period. The higher nutrient levels in the surface layer generally are a result of the additions of fertilizer to agricultural soils or biocycling in undisturbed soils. Examples are the Cascilla, Bienville, and Cahaba soils.

The fourth type includes soils that have a relatively low level of available nutrients throughout. These soils formed in material that is low in fertility, or they are older soils that have been subject to intense weathering over a long period. These soils have not accumulated nutrients in the surface layer as a result of the addition of fertilizer or biocycling. Because the majority of these soils have developed in the younger, coastal Pleistocene terraces, this group is not represented in Jefferson Davis Parish.

Soil properties, such as reaction, can also show the general distribution patterns described in the previous paragraphs. These patterns are a result of the interactions of parent material, weathering (climate), time, and to a lesser extent organisms and topography.

Nitrogen.—Generally, over 90 percent of the nitrogen in the surface layer is in the form of organic nitrogen. Most of the nitrogen in the subsoil is in the form of fixed ammonium compounds. These forms of nitrogen are unavailable for plant uptake, but they can be converted to readily available ammonium and nitrate species.

Nitrogen generally is the most limiting nutrient element in crop production because of high plant demand. Because reliable nitrogen soil tests are not available, nitrogen fertilizer recommendations are nearly always based on the nitrogen requirement of the crop rather than on nitrogen soil test levels.

Despite the lack of adequate nitrogen soil tests, the amount of readily available ammonium and nitrate nitrogen in the soil, the amount of organic nitrogen, the rate of mineralization of organic nitrogen to available forms of inorganic nitrogen, and the rate of conversion of fixed ammonium nitrogen to available forms can indicate the fertility status of a soil with respect to nitrogen. Because the amounts and rates of transformation of the various forms of nitrogen in the soils of the parish are not known, no assessment of the nitrogen fertility status of these soils can be made. However, nitrogen fertilizer recommendations obtained from the Louisiana Cooperative Extension Service can be used to determine application rates.

Phosphorus.—Phosphorus occurs in soils as inorganic phosphorus in soil solution; as discrete minerals, such as hydroxyapatite, variscite, and strengite; as occluded or co-precipitated phosphorus in other minerals; as retained phosphorus on mineral surfaces, such as carbonates, metal oxides, and layer silicates; and in organic compounds. Soil solution concentrations of phosphorus are generally low. Since plant roots obtain almost all phosphorus from the soil solution, phosphorus uptake depends on the ability of the soil solid phase phosphorus to maintain phosphorus concentration in soil solution. Soil test procedures generally attempt to measure soil solution phosphorus, plus the readily available solid phase phosphorus that buffers the solution phase concentration.

The Bray 2 extractant tends to extract more phosphorus than the more commonly used Bray 1 *(5)*, Mehlich 1 *(15)*, and Olsen *(19)* extractants. The Bray 2 extractant provides an estimate of the supply of phosphorus available to plants. The Bray 2 extractable phosphorus content of most of the soils in Jefferson Davis Parish is uniformly low throughout the soil profile, except where addition of fertilizer phosphorus has raised the level of extractable phosphorus in the surface layer. These low levels of available phosphorus limit crop production. The soils require continual additions of phosphorus fertilizer to build up and maintain adequate levels of available phosphorus for sustained crop production.

Potassium.—Potassium occurs in four major forms in soils. These are soil solution potassium, exchangeable potassium associated with negatively charged sites on clay mineral surfaces, nonexchangeable potassium trapped between clay mineral interlayers, and structural potassium within the crystal lattice of minerals. The exchangeable form of potassium in soils is replaced by other cations and generally is readily available for plant uptake. To become available to plants, nonexchangeable potassium and structural potassium must be converted to exchangeable potassium through weathering reactions.

The exchangeable potassium content in soils is an estimate of the supply of potassium available to plants. The available supply of potassium in the soils of Jefferson Davis Parish is very low to low throughout the soil profile, but it can increase slightly with depth as the content of clay increases; as it does, for example, in the Kaplan and Mowata soils. Low exchangeable potassium levels indicate that these soils do not have micaceous minerals, which are a source of exchangeable potassium during weathering.

Crops respond to applications of potassium fertilizer if exchangeable potassium levels are very low or low. Low levels gradually can be built up by adding potassium fertilizer if the soils contain a sufficient amount of clay to hold the potassium. Exchangeable potassium levels can be maintained by adding enough potassium fertilizer to account for crop removal, by fixation of exchangeable potassium to nonexchangeable potassium, and by leaching losses. The soils in the parish that have a sandier texture, such as the Bienville and Cahaba soils, do not have a sufficient amount of clay in the root zone for the cation-exchange capacity to be high enough to maintain adequate quantities of available potassium for sustained crop production. These soils require more frequent additions of potassium because of losses by leaching.

Magnesium.—Magnesium occurs in soil solution, as exchangeable magnesium associated with negatively charged sites on clay mineral surfaces, and as structural magnesium in mineral crystal lattices. Solution and exchangeable magnesium generally are readily available for plant uptake; whereas, structural magnesium must be converted to exchangeable magnesium during mineral weathering reactions.

According to soil test interpretation guidelines, the content of exchangeable magnesium in soils of the parish is low, medium, or high, depending upon soil texture. Low exchangeable magnesium levels are found throughout most of the soil profile in soils, such as the Bienville soils. The Guyton soils have low levels in the upper part of the profile and medium to high levels in the lower part. Variable levels throughout the profile are evident in the Mowata soils, and medium to high levels are found throughout the soil profile in the Glenmora soils. Higher levels of exchangeable magnesium in certain soil horizons are generally associated with higher content of clay in those horizons.

The levels of exchangeable magnesium in most of the soils in Jefferson Davis Parish are more than adequate for crop production, especially when the plant roots can exploit the high levels that are in the subsoil. Because magnesium deficiencies in plants are normally rare, fertilizer sources of magnesium are generally not needed for crop production.

Calcium.—Calcium occurs in soil solution, as exchangeable calcium associated with negatively charged sites on clay mineral surfaces, and as structural calcium in mineral crystal lattices. Exchangeable calcium generally is available for plant uptake, whereas structural calcium is not.

Calcium deficiencies in plants are extremely rare. Calcium is normally included with the material added to soils when lime is applied to correct problems associated with soil acidity.

Some soils in Jefferson Davis Parish, such as the Kaplan and Mowata soils, have medium to high levels of exchangeable calcium throughout the profile. Other soils, such as the Basile and Guyton soils, have low levels in the upper part of the profile and medium to high levels in the lower part. Still other soils, such as the Cahaba and Kinder soils, have variable levels throughout the soil profile. High levels of exchangeable calcium in the surface layer generally are in areas where pH levels are higher than in the subsoil, probably as a result of applications of lime to reduce soil acidity. Higher exchangeable calcium levels in the subsoil than in the surface layer are generally associated with a higher content of clay in the subsoil. A few soils, such as the Gore, Kaplan, Judice, and Morey soils, have free calcium carbonate. It originates either from translocation within the profile or as a secondary deposit directly above the water table.

Calcium is normally the most abundant exchangeable cation in soils. The subsoil of the Cahaba, Caddo, and Messer soils, however, has more exchangeable magnesium than exchangeable calcium. In the other soils in the parish, the exchangeable calcium levels are higher than, or about the same as, the exchangeable magnesium levels.

Organic matter.—The organic matter content of a soil greatly influences other soil properties. High organic matter content in mineral soil is desirable, while low organic matter content can lead to many problems. Increasing the organic matter content can greatly improve soil structure, drainage, and other physical properties. It can also increase the moisture-holding capacity, the cation-exchange capacity, and the nitrogen content.

Increasing the organic matter content is difficult, because organic matter is continually subject to microbial degradation. This is especially true in Louisiana, where higher soil temperatures and water content increase the extent of microbial activity. The rate of organic matter degradation in native plant communities is balanced by the rate of input of fresh material. Disruption of this natural process can lead to a decline in the organic matter content of the soil. Management practices that cause erosion lead to a further decrease.

If no degradation of organic matter occurs, 10 tons of organic matter is needed to raise the organic matter content of the top 6 inches of a soil by just 1 percent. Since breakdown of organic matter does occur in the soil, large amounts of organic matter must be added for several decades to produce a small increase in the organic matter content. Conservation tillage and use of cover crops slowly increase the organic matter content over time, or at least prevent further declines.

The organic matter content of the soils of the parish is low. It decreases sharply with depth because fresh inputs of organic matter are confined to the surface layer. The low levels reflect a high rate of organic matter degradation, erosion, and use of cultural practices that make maintenance of a higher content of organic matter difficult.

Sodium.—Sodium occurs in soil solution, as exchangeable sodium associated with negatively charged sites on clay mineral surfaces, and as structural sodium in mineral crystal lattices. Because sodium is readily soluble and is generally not strongly retained by soils, well drained soils subject to moderate or high rainfall do not normally contain significant amounts of sodium. Soils in low rainfall environments, soils that have restricted drainage in the subsoil, and soils of the coastal marsh may have significant amounts of sodium. High levels of exchangeable sodium are associated with undesirable physical properties, such as poor structure, slow permeability, and restricted drainage.

Although some soils in Jefferson Davis Parish contain more exchangeable sodium than exchangeable potassium, none of the soils have excessive levels of exchangeable sodium. Elevated levels of exchangeable sodium are in the subsoil of the Basile and Kaplan soils. Higher than normal levels of exchangeable sodium are probably associated with restricted drainage in the subsoil. Levels of exchangeable sodium that make up more than 6 percent of the sum of the cation-exchange capacity in the root zone of summer annuals can create undesirable physical properties in soils, such as crusting of the surface, dispersion of soil particles, low water infiltration rates, and low hydraulic conductivity.

Soil pH, exchangeable aluminum and hydrogen, and exchangeable and total acidity.—The pH of the soil solution in contact with the soil affects other soil properties. Soil pH is an intensity factor rather than a quantity factor. The lower the pH, the more acidic the soil. Soil pH controls the availability of essential and nonessential elements for plant uptake by controlling mineral solubility, ion exchange, and adsorption-desorption reactions with soil surfaces. Soil pH also affects microbial activity.

Aluminum occurs in soils as exchangeable monomeric hydrolysis species, nonexchangeable polymeric hydrolysis species, aluminum oxides, and aluminosilicate minerals. Exchangeable aluminum in soils is determined by extraction with neutral salts, such as potassium chloride or barium chloride. The exchangeable aluminum in soils is directly related to pH. If pH is less than 5.5, the soils have significant amounts of exchangeable aluminum that have a charge of plus 3. This amount of aluminum is toxic to plants. The toxic effects of aluminum on plants can be alleviated by adding lime to convert exchangeable aluminum to nonexchangeable polymeric hydrolysis species. High levels of organic matter can also alleviate aluminum toxicity.

Sources of exchangeable hydrogen in soils include hydrolysis of exchangeable and nonexchangeable aluminum and pH-dependent exchange sites on metal oxides, certain layer silicates, and organic matter. Exchangeable hydrogen, as determined by extraction with such neutral salts as potassium chloride, is normally not a major component of soil acidity because it is not readily replaced by other cations unless accompanied by a neutralization reaction. Most of the neutral salt-exchangeable hydrogen in soils apparently comes from aluminum hydrolysis.

Acidity from hydrolysis of neutral salt-exchangeable aluminum plus neutral salt-exchangeable hydrogen from pH-dependent exchange sites makes up the exchangeable acidity in soils. Exchangeable acidity is determined by the pH of the soil. Titratable acidity is the amount of acidity neutralized to a selected pH, generally pH 7 or 8.2, and constitutes the total potential acidity of a soil determined up to a given pH. All sources of soil acidity, including hydrolysis of monomeric and polymeric aluminum species and hydrogen from pH-dependent exchange sites on metal oxides, layer silicates, and organic matter, contribute to the total potential acidity. Total potential acidity in soils is determined by titration with bases or incubation with lime; extraction with a buffered extractant followed by titration of the buffered extractant (pH 8.2, barium chloride-triethanolamine method); or equilibration with buffers followed by estimation of acidity from changes in buffer pH.

Most soils of the parish have a low pH, significant quantities of exchangeable aluminum, and high levels of total acidity. Examples are the Bienville, Cascilla, and Glenmora soils. The high levels of exchangeable aluminum are a major limiting factor in crop production. High levels of exchangeable aluminum in the surface layer can be reduced by liming, but no economical methods are presently available to neutralize soil acidity below the surface layer. Exchangeable aluminum levels can be reduced by applying gypsum so that the calcium leaches through the soil and replaces the exchangeable aluminum.

Cation-exchange capacity.—The cation-exchange capacity is a measure of the amount of nutrient and nonnutrient cations a soil can hold in an exchangeable form. The cation-exchange capacity depends on the number of negatively charged sites—both permanent and pH-dependent—present in the soil. Permanent charge cation-exchange sites occur because a net negative charge develops on a mineral surface from substitution of ions within the crystal lattice. A negative charge develops from ionization of surface hydroxyl groups on minerals. Organic matter also produces pH-dependent cation-exchange sites.

Methods for determining cation-exchange capacity use buffered or unbuffered salts to measure the cation-exchange capacity at a specified pH. These methods produce different results because the method that uses unbuffered salts includes only part of the pH-dependent cation-exchange capacity, and the method that uses buffered salts includes all of the pH-dependent cation-exchange capacity up to the pH of the buffer (generally pH 7 or 8.2). Errors in the saturation, washing, and replacement steps can also cause different results.

The effective cation-exchange capacity is the sum of exchangeable bases, which includes calcium, magnesium, potassium, and sodium. Effective cation-exchange capacity is determined by extraction with 1 molar ammonium acetate at pH 7, plus the sum of neutral salt-exchangeable aluminum and hydrogen (exchangeable acidity). The sum cation-exchange capacity is the sum of exchangeable bases, plus the total acidity determined by extraction with pH 8.2, barium chloride-triethanolamine. The effective cation-exchange capacity is generally less than the sum cation-exchange capacity and includes only that part of the pH-dependent cation-exchange capacity that is determined by exchange of hydrogen with a neutral salt. The sum cation-exchange capacity includes all of the pH-dependent cation-exchange capacity up to pH 8.2. If a soil contains no pH-dependent exchange sites, or the pH of the soil is about 8.2, the effective and sum cation-exchange capacity will be about the same. The larger the cation-exchange capacity, the larger the capacity to store nutrient cations.

The pH-dependent charge is a significant source of the cation-exchange capacity in most of the soils of Jefferson Davis Parish. Since the pH-dependent cation-exchange capacity increases with pH, cation-exchange capacity of many of the soils can be increased by adding lime. This results in a greater storage capacity for nutrient cations, such as potassium, magnesium, and calcium.

Physical and Chemical Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in table 19 and the results of chemical analysis in table 20. The data are for soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section “Soil Series and Their Morphology.” Soil samples were analyzed by the Soil Characterization Laboratory, Louisiana Agricultural Experiment Station.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(28)*.

Sand—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).

Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).

Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1).
Water retained—pressure extraction, percentage of ovendry weight of less than 2 mm material; 1/3 or 1/10 (3/10) bar (4B1), 15 bars (4B2).
Water-retention difference—between 1/3 bar and 15 bars for less than 2 mm material (4C1).
Moist bulk density—of less than 2 mm material, saran-coated clods at air-dry (4A1b), ovendry (4A1h), and field moist (4A3a), conditions.
Coefficient of linear extensibility (COLE)—change in clod dimension based on less than 2 mm material (4D1).
Extractable bases—ammonium acetate pH 7.0, uncorrected; calcium (6N2e), magnesium (6O2d), potassium (6Q2b), sodium (6P2b).
Extractable acidity—barium chloride-triethanolamine (BaCl2-TEA solution) (6G2b).
Cation-exchange capacity—ammonium acetate, pH 7.0 (5A1b).
Base saturation—ammonium acetate, pH 7.0 (5C1).
Organic carbon—potassium dichromate, sulfuric acid wet digestion (6A1a).
Reaction (pH)—1:1 water dilution (8C1a).
Reaction (pH)—potassium chloride (8C1c).
Reaction (pH)—calcium chloride (8C1e).
Iron oxides as Fe—sodium dithionate extract (6C2b).
Aluminum—potassium chloride extraction (6G7a).
Extractable phosphorus—Bray 2.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(27)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve 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; type of saturation; 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 Hydraquents (*Hydr*, meaning the presence of water, plus *aquent*, the suborder of the Entisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup 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 taxonomic class. 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 Hydraquents.

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

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example is the Arat series, which is a member of the fine-silty, siliceous, nonacid, thermic Typic Hydraquents.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each 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” *(26)*. Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” *(27)*. Unless otherwise indicated, 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.”

Acadia Series

The Acadia series consists of somewhat poorly drained, very slowly permeable soils that formed in loamy and clayey sediments of Pleistocene age. These soils are on terraces of the Gulf Coast Prairies. Slopes range from 1 to 3 percent. The soils of the

Acadia series are fine, montmorillonitic, thermic Aeric Ochraqualfs.

Acadia soils commonly are near the Basile, Crowley, Gore, Kaplan, and Kinder soils. The Basile soils are on flood plains and are fine-silty. The Crowley soils are higher on the landscape than the Acadia soils and have an abrupt textural change from the E horizon to the B horizon. The Gore soils are on the steeper slopes and have a reddish subsoil. The Kaplan soils are in positions similar to those of the Acadia soils and are more alkaline throughout. The Kinder soils are on broad flats and are fine-silty.

Typical pedon of Acadia silt loam, 1 to 3 percent slopes; about 3.5 miles north of Panchoville, 1 mile east of Parish Road D-10, 1,100 feet north of Parish Road 4-26A; SE1/4SW1/4 sec. 25, T. 7 S., R. 3 W.

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

E—4 to 6 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct yellowish brown (10YR 5/4) mottles; few fine distinct dark yellowish brown (10YR 4/4) mottles; weak thin platy structure; friable; common fine roots; very strongly acid; abrupt irregular boundary.

BE—6 to 14 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct grayish brown (10YR 5/2) mottles and few fine faint dark yellowish brown mottles; weak coarse subangular blocky structure; friable; few fine roots; few fine pores; few faint clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Bt—14 to 20 inches; light yellowish brown (10YR 6/4) silty clay; many medium prominent red (2.5YR 4/6) mottles; weak medium and fine subangular blocky structure; plastic, sticky; few fine roots; few distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Btg—20 to 41 inches; grayish brown (10YR 5/2) silty clay; many fine and medium prominent red (2.5YR 4/8) mottles; moderate medium and fine subangular blocky structure; plastic, sticky; few fine roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—41 to 48 inches; light brownish gray (10YR 6/2) silty clay loam; many coarse prominent red (2.5YR 4/8) mottles; weak coarse prismatic structure parting to weak medium and fine subangular blocky; common accumulations of iron and manganese; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

BC—48 to 60 inches; red (2.5YR 4/8) silty clay loam; many coarse prominent light olive gray (5Y 6/2) mottles; weak coarse subangular blocky structure; plastic, sticky; few fine roots; few accumulations of iron and manganese; cracks between peds filled with gray (5Y 6/1) silty clay loam; strongly acid; clear wavy boundary.

2BC1—60 to 70 inches; yellowish red (5YR 4/6) silt loam; many coarse prominent light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; friable; few fine pores; cracks between prisms filled with gray (5Y 6/1) silty clay loam; strongly acid; gradual wavy boundary.

2BC2—70 to 80 inches; strong brown (7.5YR 5/6) silt loam; many coarse prominent light olive gray (5Y 6/2) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; friable; common fine pores; common accumulations of iron and manganese; strongly acid.

The thickness of the solum ranges from 30 to 80 inches or more. Depth to the clayey Bt horizon ranges from 10 to 20 inches. In at least one subhorizon within 30 inches of the surface, the level of aluminum saturation is 20 to 50 percent of the effective cation-exchange capacity.

The Ap horizon has value of 4 or 5, and chroma of 1 to 3, or value of 5 and chroma of 2 or 3. Thickness ranges from 4 to 8 inches. Reaction ranges from very strongly acid to moderately acid.

The E horizon has value of 5 or 6 and chroma of 2 to 4. Thickness ranges from 2 to 12 inches. Reaction ranges from very strongly acid to moderately acid.

The BE horizon has value of 5 or 6 and chroma of 4 to 8. Texture is silt loam or silty clay loam. Reaction is very strongly acid or strongly acid.

The Bt horizon has value of 5 or 6 and chroma of 3 to 6. Texture is clay or silty clay. Reaction ranges from very strongly acid to moderately acid.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is silty clay or clay. Reaction ranges from very strongly acid to moderately acid.

The BCg horizon has the same range in colors as the Btg horizon. Texture is clay, silty clay, or silty clay loam. Reaction ranges from very strongly acid to moderately acid.

The BC and 2BC horizons have hue of 2.5YR, 5YR, or 7.5YR, value of 4 to 6, and chroma of 4 to 8. Texture is silt loam or silty clay loam. Reaction ranges from very strongly acid to moderately acid.

Allemands Series

The Allemands series consists of very poorly drained, very fluid organic soils. These soils formed in moderately thick accumulations of decomposed herbaceous material about 16 to 51 inches thick over clayey alluvium. They are in freshwater coastal marshes that are ponded most of the time, and they are frequently flooded. Elevations range from sea level to 2 feet above sea level. Slope is less than 1 percent. Soils of the Allemands series are clayey, montmorillonitic, euic, thermic Terric Medisaprists.

Allemands soils commonly are near the mineral Arat, Barbary, and Ged soils. The Arat and Barbary soils are in swamps. Ged soils are in positions similar to those of the Allemands soils.

Typical pedon of Allemands muck; about 5.5 miles southeast of Hayes, 1.7 miles south of Louisiana Highway 14, 0.8 mile west of Holton and Winn drainage canal; T. 11 S., R. 5 W.

Oa1—0 to 12 inches; dark brown (10YR 4/3) muck; about 30 percent fiber, 10 percent rubbed; massive; many medium and fine roots; very fluid, flows easily between fingers when squeezed leaving a small amount of residue in hand; dominantly herbaceous material; about 25 percent mineral; strongly acid; clear smooth boundary.

Oa2—12 to 30 inches; dark grayish brown (10YR 4/2) muck; about 40 percent fiber, 10 percent rubbed; massive; many medium and fine roots; very fluid, flows easily between fingers when squeezed leaving a small amount of residue in hand; dominantly herbaceous material; about 40 percent mineral; moderately acid; clear smooth boundary.

Oa3—30 to 50 inches; black (10YR 2/1) muck; about 40 percent fiber, 15 percent rubbed; massive; few medium and fine roots; very fluid, flows easily between fingers when squeezed leaving a small amount of residue in hand; dominantly herbaceous material; about 40 percent mineral; neutral; clear wavy boundary.

A—50 to 60 inches; black (10YR 2/1) mucky clay; massive; very fluid, flows easily between fingers when squeezed leaving a small amount of residue in hand; slightly alkaline; clear smooth boundary.

Cg—60 to 80 inches; gray (N 4/0) clay; massive; very fluid, flows easily between fingers when squeezed leaving a small amount of residue in hand; moderately alkaline.

The thickness of the organic material ranges from 16 to 51 inches. The organic fraction is dominantly herbaceous material.

The surface tier, 0 to 12 inches, has value of 2 to 4 and chroma of 1 to 3. The content of rubbed fiber ranges from 2 to 80 percent. Reaction ranges from strongly acid to slightly acid.

The subsurface tier, 12 to 50 inches, has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 or 2. The content of fiber ranges from 1 to 10 percent after rubbing. Reaction ranges from moderately acid to slightly alkaline.

The A horizon has hue of 10YR, 2.5Y, or 5Y and value of 2 to 4. Texture is clay or mucky clay. Reaction ranges from slightly acid to moderately alkaline.

The Cg horizon has hue of 10YR, 5Y, 5G, or 5BG, value of 4 to 6, and chroma of 1, or it is neutral and has value of 4 to 6. Texture is silty clay, clay, or mucky clay. Reaction ranges from slightly acid to moderately alkaline.

Arat Series

The Arat series consists of very poorly drained, slowly permeable, very fluid soils that formed in loamy alluvium. These soils are in swamps. They are ponded most of the time and are frequently flooded. Slope is less than 1 percent. Soils of the Arat series are fine-silty, siliceous, nonacid, thermic Typic Hydraquents.

The Arat soils commonly are near the Acadia, Allemands, Basile, Crowley, Ged, and Midland soils. The Acadia, Basile, Crowley, Ged, and Midland soils are higher on the landscape than the Arat soils and have a firm, mineral subsoil. The Allemands soils are in freshwater marshes and are organic soils.

Typical pedon of Arat mucky silt loam; 2.25 miles east of Verrett, 500 feet east of Bayou Lacassine; SW1/4NW1/4 sec. 28, T. 10 S., R. 5 W.

A—0 to 6 inches; very dark grayish brown (10YR 3/2) mucky silt loam; massive; very fluid, flows easily between fingers when squeezed; about 15 percent organic matter in the form of wood fragments and herbaceous fiber; slightly acid; clear smooth boundary.

Cg1—6 to 36 inches; dark grayish brown (10YR 4/2) silt loam; massive; very fluid, flows easily between fingers when squeezed; slightly acid; abrupt smooth boundary.

Cg2—36 to 60 inches; dark grayish brown (10YR 4/2) silty clay loam makes up about 10 percent of horizon; massive; very fluid, flows easily between fingers when squeezed; about 90 percent logs and partially decomposed wood fragments; slightly acid.

All mineral horizons have an n-value of 1 or more. The 0 horizon, if it occurs, has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is partially decomposed wood or peat. Reaction in the 0 horizon ranges from strongly acid to slightly acid.

The A horizon has value of 2 to 4 and chroma of 1 or 2. Reaction ranges from strongly acid to neutral. Undecomposed logs and fragments of wood range from few to many.

The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 5, and chroma of 1 or 2. Texture is silty clay loam, silt loam, or mucky silty clay loam. Reaction ranges from moderately acid to slightly alkaline. Subhorizons of the C horizon contain 50 to 95 percent logs and wood fragments, by volume.

Barbary Series

The Barbary series consists of very poorly drained, very slowly permeable, slightly fluid and very fluid soils that formed in clayey alluvium. These soils are in swamps. They are ponded most of the time and are frequently flooded. Slope is less than 1 percent. Soils of the Barbary series are very-fine, montmorillonitic, nonacid, thermic Typic Hydraquents.

Barbary soils commonly are near the Acadia, Arat, Basile, Gore, and Kaplan soils. The Acadia, Gore, and Kaplan soils are on terraces and are friable or firm throughout. The Arat soils are in positions similar to those of the Barbary soils and are fine-silty. The Basile soils are on flood plains and are fine-silty and friable or firm throughout.

Typical pedon of Barbary mucky clay; 3.25 miles northeast of Lake Arthur, 1,300 feet west of the Mermentau River; Spanish Land Grant sec. 13, T. 11 S., R. 3 W.

A—0 to 10 inches; dark grayish brown (10YR 4/2) mucky clay; massive; slightly fluid, flows easily between fingers when squeezed leaving a small amount of residue in hand; many fine and medium roots; few fragments of wood; neutral; gradual smooth boundary.

Cg1—10 to 30 inches; dark gray (10YR 4/1) clay; massive; very fluid, flows easily between fingers when squeezed leaving hand empty; few fragments of wood; neutral; gradual wavy boundary.

Cg2—30 to 60 inches; dark gray (5Y 4/1) clay; massive; slightly fluid, flows with difficulty between fingers when squeezed leaving a large amount of residue in hand; common logs and fragments of wood; neutral.

The n-values are greater than 0.7 in all horizons to a depth of 40 inches or more.

The A horizon has hue of 10YR or 5Y, value of 3 to 5, and chroma of 1 or 2. Reaction is neutral or slightly alkaline.

The Cg horizon has hue of 10YR, 5Y, 5GY, 5G, or 5BG, value of 4 or 5, and chroma of l. Texture is clay or mucky clay. Reaction ranges from neutral to moderately alkaline.

Basile Series

The Basile series consists of poorly drained, slowly permeable soils that formed in loamy alluvium of late Pleistocene age. These soils are on flood plains, and they are frequently flooded. Slope is less than 1 percent. The soils of the Basile series are fine-silty, mixed, thermic Typic Glossaqualfs.

Basile soils commonly are near the Acadia, Arat, Barbary, Cascilla, Crowley, Gore, Guyton, Kaplan, and Kinder soils. The Acadia, Crowley, Gore, Kaplan, and Kinder soils are on terraces. The Acadia, Crowley, Gore, and Kaplan soils have a fine-textured control section. The Arat soils are in swamps and are ponded most of the time. The Kinder soils have reddish mottles and are more acid throughout the profile. The Cascilla soils are higher on the landscape than the Basile soils and are brownish throughout. The Guyton soils are in positions similar to those of the Basile soils and are acid throughout.

Typical pedon of Basile silt loam, in an area of Basile and Cascilla silt loams, frequently flooded; 4.25 miles northeast of Panchoville, 1,000 feet west of Mitchell Lake, 200 feet west of Bayou Nezpique; SE1/4NW1/4 sec. 31, T. 7 S., R. 2 W.

A—0 to 5 inches; grayish brown (10YR 5/2) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Eg1—5 to 16 inches; light gray (10YR 7/2) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; many medium and few coarse roots; few fine discontinuous random tubular pores; few fine black and brown concretions; very strongly acid; clear wavy boundary.

Eg2—16 to 24 inches; light gray (10YR 7/2) silt loam; common fine distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/6) mottles;

weak medium subangular blocky structure; firm; few fine roots; common fine discontinuous random tubular pores; many soft brown and black accumulations; very strongly acid; gradual wavy boundary.

B/E—24 to 33 inches; grayish brown (10YR 5/2) silty clay loam (Bt); few fine distinct yellowish brown (10YR 5/6) mottles; about 15 percent light gray (10YR 6/1) silt loam (E); moderate medium subangular blocky structure; firm; few fine roots; common fine discontinuous random tubular pores; few faint clay films on faces of peds in Bt part; few soft black accumulations; strongly acid; clear smooth boundary.

Btg—33 to 43 inches; gray (10YR 5/1) silty clay loam; few fine prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; common fine discontinuous random tubular pores; many distinct clay films on faces of peds; few coatings of silt on vertical faces of peds; few fine manganese concretions; neutral; gradual wavy boundary.

Btng—43 to 60 inches; gray (10YR 5/1) silty clay loam; few fine prominent yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common fine discontinuous random tubular pores; many distinct clay films on faces of peds; common coatings of silt on prism faces; neutral; gradual wavy boundary.

BCg1—60 to 80 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; few coatings of silt on faces of peds; slightly alkaline; gradual wavy boundary.

BCg2—80 to 96 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few coatings of silt on faces of peds; moderately alkaline.

The thickness of the solum ranges from 40 to 100 inches. Base saturation is greater than 80 percent at 50 inches below the top of the argillic horizon. In at least one subhorizon within a depth of 30 inches the level of exchangeable aluminum is 20 to 50 percent of the effective cation-exchange capacity. Subhorizons that have exchangeable sodium percentage greater than 15 are at depths greater than 16 inches below the upper boundary of the argillic horizon.

The A horizon has value of 4 to 6 and chroma of 1 or 2. Thickness ranges from 3 to 6 inches. Reaction ranges from very strongly acid to neutral.

The Eg horizon has value of 5 to 7 and chroma of 1 or 2. It is 12 to 24 inches thick. Mottles are in shades of brown. Reaction ranges from very strongly acid to slightly acid.

The Btg horizon, Btng horizon, and the Bt part of the B/E horizon have hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2. Mottles, in shades of brown, range from few to many. Texture is silt loam or silty clay loam. Reaction ranges from moderately acid to moderately alkaline.

The BCg horizon has the same range in colors and textures as the Btg horizon. Reaction ranges from slightly acid to moderately alkaline. Some pedons contain concretions of calcium carbonate in the BCg horizon.

Bienville Series

The Bienville series consists of somewhat excessively drained, moderately rapidly permeable soils that formed in sandy sediments of Pleistocene age. These soils are on terraces. Some of these soils are subject to flooding. Slopes range from 1 to 3 percent. Soils of the Bienville series are sandy, siliceous, thermic Psammentic Paleudalfs.

Bienville soils commonly are near Acadia, Cahaba, Gore, Guyton, Kinder, and Messer soils. None of these soils have a sandy control section. The Acadia, Gore, Kinder, and Messer soils are on adjacent terraces at a higher elevation than the Bienville soils. The Cahaba and Guyton soils are lower on the landscape than the Bienville soils.

Typical pedon of Bienville loamy fine sand, in an area of Bienville-Guyton complex, gently undulating; 3.5 miles east of Topsy, 450 feet west of gravel road, 30 feet north of dirt road, 1,300 feet north and 100 feet west of the southeast corner of sec. 27; SE$^1/_4$ SE$^1/_4$ sec. 27, T. 7 S., R. 7 W.

A—0 to 4 inches; dark yellowish brown (10YR 4/4) loamy fine sand; weak fine granular structure; very friable; many very fine and common medium roots; strongly acid; clear smooth boundary.

E—4 to 14 inches; yellowish brown (10YR 5/4) loamy fine sand; weak fine subangular blocky structure parting to weak fine granular; very friable; common fine and medium roots; few pale brown spots of uncoated sand grains; strongly acid; clear wavy boundary.

B/E—14 to 29 inches; strong brown (7.5YR 5/6) loamy fine sand (Bt); about 20 percent very pale brown (10YR 7/4) spots and pockets of uncoated sand grains (E); weak fine subangular blocky structure; very friable; common fine and very fine roots; sand grains in Bt part bridged with clay; very strongly acid; gradual wavy boundary.

Bt1—29 to 47 inches; strong brown (7.5YR 5/4) loamy fine sand; weak medium subangular blocky structure; very friable; few fine roots; sand grains bridged with clay; very strongly acid; clear wavy boundary.

Bt2—47 to 62 inches; strong brown (7.5YR 5/6) loamy fine sand; weak medium subangular blocky structure; friable; few fine roots; sand grains bridged with clay; strongly acid; clear wavy boundary.

The thickness of the solum ranges from 60 to 80 inches.

The A horizon has value of 4 or 5 and chroma of 2 to 4. Thickness ranges from 4 to 10 inches. Reaction ranges from very strongly acid to slightly acid.

The E horizon and the E part of the B/E horizon have value of 4 to 7 and chroma of 3 or 4. The E horizon is 10 to 30 inches thick. Texture is fine sand or loamy fine sand. Reaction ranges from very strongly acid to slightly acid.

The Bt horizon and the Bt part of the B/E horizon have hue of 10YR, 7.5YR, or 5YR and value and chroma of 4 to 6. Streaks of E material comprise 15 to 40 percent of the B/E horizon. Texture is fine sandy loam, loamy fine sand, or fine sand. Reaction ranges from very strongly acid to moderately acid. In some pedons the lower part of the Bt horizon is in the form of lamellae.

Caddo Series

The Caddo series consists of poorly drained, slowly permeable soils that formed in loamy sediments of Pleistocene age. These soils are on terraces of the Gulf Coast Prairies. Slope is less than 1 percent. Soils of the Caddo series are fine-silty, siliceous, thermic Typic Glossaqualfs.

Caddo soils commonly are near the Glenmora, Guyton, and Messer soils. The Glenmora soils are on ridges and side slopes and are browner in the upper part of the subsoil. The Guyton soils are slightly lower on the landscape than the Caddo soils and do not have red mottles in the subsoil. The Messer soils are on mounds or smoothed mound areas and are coarse-silty.

Typical pedon of Caddo silt loam, in an area of Caddo-Messer silt loams; 4 miles east of Gillis, 600 feet south of dirt road; SW1/4SW1/4 sec. 6, T. 8 S., R. 7 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine and common coarse roots; few fine brown and black concretions; common fine distinct dark yellowish brown (10YR 4/4) oxidation stains in root channels; strongly acid; abrupt smooth boundary.

Eg1—6 to 15 inches; grayish brown (10YR 5/2) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine discontinuous random tubular pores; few fine brown and black concretions; few fine prominent yellowish red (5YR 5/8) oxidation stains in root channels; very strongly acid; clear wavy boundary.

Eg2—15 to 21 inches; light brownish gray (10YR 5/2) silt loam; few medium prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable and slightly brittle; few fine roots; common fine discontinuous random tubular pores; few fine brown and black concretions; very strongly acid; abrupt irregular boundary.

B/E1—21 to 27 inches; gray (10YR 5/1) silty clay loam (Bt); common fine prominent red (2.5YR 4/8) mottles and common medium prominent yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to moderate coarse subangular blocky; firm; few fine roots; many fine discontinuous random tubular pores; common faint clay films on faces of peds; tongues of light brownish gray (10YR 6/2) silt loam (E) are 0.25 inch to 4 inches wide that make up about 20 percent of the horizon; few medium and fine nodules of plinthite; few medium iron and manganese nodules; strongly acid; gradual wavy boundary.

B/E2—27 to 38 inches; gray (10YR 5/1) silty clay loam; common fine prominent red (2.5YR 4/8) mottles and common medium prominent yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to moderate coarse subangular blocky; firm; few fine roots; many fine discontinuous random tubular pores; common distinct clay films on faces of peds; tongues and pockets of light gray (10YR 7/1) silt loam (E) that make up about 15 percent of the horizon; few medium and fine nodules of plinthite; common fine iron and manganese nodules; strongly acid; gradual wavy boundary.

Btg—38 to 47 inches; gray (10YR 5/1) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles and common fine prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; few fine discontinuous random tubular pores; common fine pockets of light gray (10YR 7/1) silt; common distinct clay films on faces of peds; common root channels lined with dark gray (10YR 4/1) clay; moderately acid; gradual wavy boundary.

BCg—47 to 68 inches; grayish brown (10YR 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles and few fine prominent red (2.5YR 4/8) mottles; weak coarse subangular blocky structure; firm; few fine discontinuous random tubular pores; few root channels lined with dark gray (10YR 4/1) clay; moderately acid.

The thickness of the solum ranges from 60 to 100 inches. Reaction ranges from very strongly acid to moderately acid throughout. In at least one subhorizon within a depth of 30 inches, the level of aluminum saturation is 50 percent or more of the effective cation-exchange capacity.

The Ap horizon has value of 4 or 5 and chroma of 1 or 2. Thickness ranges from 2 to 8 inches.

The Eg horizon and the E part of the B/E horizon have value of 5 or 6 and chroma of 1 or 2. Thickness ranges from 11 to 30 inches. Mottles, in shades of brown, range from few to many.

The Btg horizon and the Bt part of the B/E horizon have value of 5 to 7 and chroma of 1 or 2. Mottles, in shades of red, brown, and yellow, range from few to many. Texture is silt loam, loam, or silty clay loam.

The BCg horizon has the same colors, texture, and reaction as the Btg horizon.

Cahaba Series

The Cahaba series consists of well drained, moderately permeable soils that formed in loamy and sandy sediments of Pleistocene age. These soils are on terraces. Slopes range from 1 to 3 percent. Soils of the Cahaba series are fine-loamy, siliceous, thermic Typic Hapludults.

Cahaba soils commonly are near the Bienville, Guyton, Kinder, Leton, and Messer soils. The Bienville soils are slightly higher on the landscape than the Cahaba soils and are sandy throughout. The Guyton soils are in lower positions and are fine-silty. The Kinder and Leton soils are on nearby terraces at higher elevations than the Cahaba soils and are fine-silty. The Messer soils are on mounds or smoothed mound areas and are coarse-silty.

Typical pedon of Cahaba fine sandy loam, 1 to 3 percent slopes; 1.25 miles southwest of Indian Village, 50 feet north of Parish Road 9-383-F; NE1/4NE1/4 sec. 20, T. 7 S., R. 6 W.

A1—0 to 2 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

A2—2 to 8 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

E—8 to 18 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear smooth boundary.

B/E—18 to 25 inches; yellowish red (5YR 5/6) fine sandy loam (Bt) and tongues of light yellowish brown (10YR 6/4) fine sandy loam (E); weak fine granular structure; very friable; common fine roots; few faint clay films on faces of peds in Bt part; very strongly acid; clear smooth boundary.

Bt1—25 to 42 inches; yellowish red (5YR 5/6) loam; common fine prominent pinkish gray (7.5YR 7/2) mottles and common fine distinct light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—42 to 60 inches; yellowish red (5YR 5/6) loam; few fine distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; extremely acid; gradual wavy boundary.

C—60 to 81 inches; strong brown (7.5YR 5/8) loamy sand; common fine prominent light yellowish brown (10YR 6/4) mottles and few medium prominent light gray (10YR 7/2) mottles; friable; massive; extremely acid.

The thickness of the solum ranges from 36 to 60 inches. In at least one subhorizon within a depth of 30 inches, the level of aluminum saturation is 20 to 50 percent of the effective cation-exchange capacity.

The A horizon has value of 3 to 5 and chroma of 2 or 3. Thickness ranges from 4 to 8 inches. Reaction ranges from very strongly acid to moderately acid.

The E horizon has value of 4 to 6 and chroma of 2 to 4. It is fine sandy loam or loamy fine sand and ranges in thickness from 4 to 12 inches. Reaction ranges from very strongly acid to moderately acid.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. Texture is sandy clay loam, loam, or clay loam. The content of clay ranges from 18 to 30 percent, and content of silt ranges from 20 to 50 percent. Reaction ranges from extremely acid to moderately acid.

The C horizon has hue of 10YR, 7.5YR, 5YR, or 2.5YR, value of 4 to 6, and chroma of 4 to 8. In some pedons, it is stratified with sand, loamy sand, and sandy loam. Reaction ranges from extremely acid to moderately acid.

Cascilla Series

The Cascilla series consists of well drained, moderately permeable soils that formed in loamy alluvium. These soils are on flood plains and are frequently flooded. Slopes range from 0 to 2 percent. Soils of the Cascilla series are fine-silty, mixed, thermic Fluventic Dystrochrepts.

The Cascilla soils in this survey area are taxadjuncts to the Cascilla series because they have an argillic horizon and are moderately acid to slightly alkaline in the lower part of the solum. These differences do not significantly affect the use and management of these soils.

Cascilla soils commonly are near the Acadia, Basile, Crowley, Gore, and Kaplan soils. All of these soils, except the Basile soils, are on terraces. The Acadia, Crowley, Gore, and Kaplan soils have a fine-textured control section. The Basile soils are lower on the landscape than the Cascilla soils and are grayish throughout.

Typical pedon of Cascilla silt loam, in an area of Basile and Cascilla silt loams, frequently flooded; 4.25 miles northeast of Panchoville, 900 feet west of Mitchell Lake, 100 feet west of Bayou Nezpique; SE1/4NW1/4 sec. 31, T. 7 S., R. 2 W.

A—0 to 7 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; few fine roots; very friable; very strongly acid; clear wavy boundary.

BA—7 to 13 inches; brown (10YR 5/3) silt loam; weak fine subangular blocky structure; very friable; few fine roots; few wormcasts; very strongly acid; clear wavy boundary.

Bw1—13 to 25 inches; brown (10YR 5/3) silt loam; many fine faint dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; very friable; few fine roots; few fine discontinuous random tubular impeded pores; few wormcasts; very strongly acid; clear wavy boundary.

Bw2—25 to 45 inches; brown (10YR 5/3) silt loam; common fine distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/3) mottles; weak medium subangular blocky structure; friable; few fine discontinuous random tubular impeded pores; very strongly acid; clear wavy boundary.

Bt1—45 to 56 inches; brown (10YR 5/3) silty clay loam; common medium prominent brownish yellow (10YR 6/8) mottles and common fine prominent red (2.5YR 4/8) mottles; weak fine subangular blocky structure; friable; few faint clay films on faces of peds; strongly acid; clear wavy boundary.

Bt2—56 to 63 inches; yellowish brown (10YR 5/4) silty clay loam; common fine prominent brownish yellow (10YR 6/8) and yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable; few faint clay films on faces of peds; moderately acid; clear wavy boundary.

BC—63 to 80 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct yellow (10YR 7/8) and grayish brown (10YR 5/2) mottles; weak coarse and medium subangular blocky structure; very friable; slightly alkaline.

The solum ranges from 45 to 80 inches in thickness. In at least one subhorizon within a depth of 30 inches, the level of exchangeable aluminum is 50 percent or more of the effective cation-exchange capacity.

The A horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is 5 to 10 inches thick. Some pedons have a thin A horizon that has hue of 10YR, value of 3, and chroma of 1 or 2. Reaction is very strongly acid or strongly acid.

The BA horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. Reaction is very strongly acid or strongly acid.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. Reaction is very strongly acid or strongly acid.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam or silty clay loam. Reaction ranges from very strongly acid to slightly acid.

The BC horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. Texture is silt loam or silty clay loam. Reaction ranges from moderately acid to moderately alkaline.

The 2C horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 6. It is fine sandy loam or loam. Reaction ranges from slightly acid to moderately alkaline.

Crowley Series

The Crowley series consists of somewhat poorly drained, very slowly permeable soils. These soils formed in loamy and clayey sediments of late

Pleistocene age. They are on terraces of the Gulf Coast Prairies. Slopes range from 0 to 3 percent. Soils of the Crowley series are fine, montmorillonitic, thermic Typic Albaqualfs.

Crowley soils commonly are near the Kaplan, Leton, Midland, Morey, Mowata, Pineisland, and Vidrine soils. The Kaplan soils are slightly lower on the landscape than the Crowley soils; and the Leton, Midland, Morey, and Mowata soils are in lower positions. The Pineisland soils are in slightly higher positions; and the Vidrine soils are on mounds, smoothed mound areas, and side slopes. The Kaplan soils are alkaline in the middle and lower parts of the subsoil. The Leton, Morey, and Pineisland soils are fine-silty. Also, the Morey soils have a mollic epipedon, and the Pineisland soils have a fragipan. The Midland soils do not have an abrupt change in texture from the albic horizon to the argillic horizon. The Mowata soils have albic material that extends into the argillic horizon. The Vidrine soils are coarse-silty over clayey.

Typical pedon of Crowley silt loam, in an area of Crowley-Vidrine silt loams, 0 to 1 percent slopes; 2 miles northeast of Welsh, 120 feet south of Parish Road 6-99-A, 1,700 feet east of Parish Road 6-21, 1,100 feet north of East Bayou Lacassine; NE$^1/_4$NW$^1/_4$ sec. 17, T. 9 S., R. 4 W.

Ap1—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots; common very fine pores; few medium black and brown concretions; moderately acid; abrupt smooth boundary.

Ap2—7 to 13 inches; dark grayish brown (10YR 4/2) silt loam; few medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium to very coarse platy structure; firm and compacted; few fine roots; moderately acid; gradual wavy boundary.

Eg—13 to 17 inches; grayish brown (10YR 5/2) silt loam; few coarse distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; many fine and very fine pores; few fine roots; few medium brown concretions; moderately acid; abrupt wavy boundary.

Btg1—17 to 31 inches; grayish brown (10YR 5/2) silty clay; many fine and medium prominent red (10R 4/8) mottles; moderate medium prismatic structure parting to moderate medium angular and subangular blocky; firm; few fine roots; many distinct clay films on faces of peds; very dark gray (10YR 3/1) coatings on vertical faces of peds; strongly acid; gradual wavy boundary.

Btg2—31 to 40 inches; grayish brown (10YR 5/2) silty clay; many medium prominent red (2.5YR 4/6) mottles and few fine prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate fine angular and subangular blocky; firm; few very fine roots; few very fine pores; many distinct clay films on faces of peds; many shiny pressure faces; strongly acid; gradual wavy boundary.

Btg3—40 to 48 inches; light brownish gray (10YR 6/2) clay loam; common medium prominent red (2.5YR 5/8) and strong brown (7.5YR 5/6) mottles and common medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to moderate coarse angular blocky; firm; few very fine roots; common very fine pores; many distinct clay films on faces of peds; few coarse black concretions; few medium black stains on peds; common shiny pressure faces; moderately acid; gradual wavy boundary.

Btg4—48 to 61 inches; grayish brown (10YR 5/2) clay loam; common medium prominent strong brown (7.5YR 5/6) and yellowish red (5YR 5/6) mottles; moderate coarse and very coarse prismatic structure; firm; few fine roots; few very fine pores; few shiny pressure faces inside peds; many distinct clay films on faces of peds; common silt coatings on vertical faces of some peds; few black stains on horizontal ped faces; slightly acid; gradual wavy boundary.

Btg5—61 to 73 inches; light brownish gray (2.5Y 6/2) clay loam; common coarse prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; moderate medium angular blocky and subangular blocky structure; firm; few very fine pores; common shiny pressure faces; few faint clay films on faces of peds; few thin coatings of silt on vertical faces of peds; slightly acid.

The thickness of the solum ranges from 40 to 75 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The Ap horizon has value of 4 or 5 and chroma of 1 or 2. It is 4 to 13 inches thick. Reaction ranges from very strongly acid to moderately acid.

The Eg horizon has value of 5 and chroma of 1 or 2 or value of 6 and chroma of 1. It is 4 to 15 inches thick. Reaction ranges from very strongly acid to moderately acid.

The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. Surfaces of peds are very dark gray or dark gray in at least the upper part of the Btg horizon. Texture is silty clay, clay loam, or silty clay loam. Reaction ranges from very strongly acid to slightly acid.

Some pedons have a BCg horizon. Where present, it has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2. Texture is clay loam, silty clay loam, or silty clay. Reaction ranges from very strongly acid to slightly acid.

Ged Series

The Ged series consists of very poorly drained, very slowly permeable soils that formed in recent, very fluid and slightly fluid, clayey alluvium overlying firm clayey sediments of Pleistocene age. These soils are in freshwater marshes that border the Gulf Coast Prairies. They are ponded most of the time and are frequently flooded. Elevations range from sea level to 2 feet above sea level. Slope is less than 1 percent. Soils of the Ged series are very-fine, mixed, thermic Typic Ochraqualfs.

Ged soils commonly are near the Allemands, Arat, Basile, Crowley, Judice, Midland, Morey, Mowata, and Vidrine soils. The Allemands soils are in landscape positions similar to those of the Ged soils and have an organic layer thicker than 16 inches. The Arat soils are in swamps and have very fluid soil layers throughout. The Basile soils are on flood plains and are fine-silty. The Crowley, Judice, Midland, and Mowata soils are on terraces and have a fine-textured control section. The Vidrine soils are on side slopes, mounds, or smoothed mound areas on terraces and are coarse-silty over clayey.

Typical pedon of Ged clay; about 6.0 miles south of Welsh, 1 mile west of Highway 99, 900 feet south of Bayou Chene, 200 feet west of drainage canal; SW1/4SE1/4 sec. 25, T. 10 S., R. 5 W.

A1—0 to 8 inches; dark gray (10YR 4/1) clay; massive; very fluid, flows easily between fingers when squeezed leaving a small amount of residue in hand; many fine roots; moderately acid; abrupt smooth boundary.

A2—8 to 16 inches; very dark gray (10YR 3/1) clay; massive; slightly fluid, flows with difficulty between fingers when squeezed leaving a large amount of residue in hand; many fine roots; moderately acid; clear wavy boundary.

Btg1—16 to 22 inches; dark gray (10YR 4/1) clay; few fine prominent yellowish brown (10YR 5/8) mottles; moderate medium and coarse subangular blocky structure; firm; plastic and sticky; few faint clay films on faces of some peds; neutral; gradual wavy boundary.

Btg2—22 to 30 inches; gray (10YR 5/1) silty clay; few fine prominent yellowish brown (10YR 5/8) mottles; moderate medium and coarse subangular blocky structure; firm; plastic and sticky; common distinct clay films on faces of peds; slightly alkaline; gradual wavy boundary.

Btg3—30 to 40 inches; gray (10YR 6/1) silty clay; common medium prominent brownish yellow (10YR 6/8) mottles; moderate medium and coarse subangular blocky structure; firm; plastic and sticky; common distinct clay films on faces of peds; slightly alkaline; gradual wavy boundary.

Btg4—40 to 62 inches; gray (10YR 6/1) silty clay; many medium prominent yellowish brown (10YR 5/8) mottles; weak medium and coarse subangular blocky structure; firm; plastic and sticky; few faint clay films on faces of peds; slightly alkaline.

The thickness of the solum ranges from 45 to 80 inches. Thickness of surface mineral layers with an n-value greater than 0.7 ranges from 4 to 18 inches.

The A1 horizon has hue of 10YR or 5Y, value of 2 to 4, and chroma of 2 or less. Reaction ranges from very strongly acid to slightly alkaline and the n-value ranges from 0.7 to 2.0.

The A2 horizon has the same color and reaction as the A1 horizon. Texture is silty clay, clay, or mucky clay. The n-value ranges from 0.1 to 0.6.

The Btg horizon and the BC horizon, if it occurs, have hue of 10YR to 5GY, value of 4 to 6, and chroma of 1 or less. Reaction ranges from slightly acid to moderately alkaline.

Glenmora Series

The Glenmora series consists of moderately well drained, slowly permeable soils that formed in loamy sediments of Pleistocene age. These soils are on terraces. Slopes range from 1 to 3 percent. Soils of the Glenmora series are fine-silty, siliceous, thermic Glossaquic Paleudalfs.

Glenmora soils commonly are near the Caddo, Guyton, Kinder, and Messer soils. The Caddo, Guyton, and Kinder soils are on broad flats and are poorly drained and grayish throughout. The Messer soils are on mounds or smoothed mound areas and are coarse-silty.

Typical pedon of Glenmora silt loam, 1 to 3 percent slopes; 0.75 mile northeast of Topsy, 2,700 feet south of parish line, 1,400 feet east of Parish Road 9-41; NW1/4SW1/4 sec. 29, T. 7 S., R. 7 W.

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

E—4 to 10 inches; yellowish brown (10YR 5/6) silt loam; weak coarse subangular blocky structure; friable; common fine roots; common fine pores; extremely acid; clear smooth boundary.

BE—10 to 14 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct brown (7.5YR 5/4) mottles; weak coarse subangular blocky structure; friable; few fine roots; few fine discontinuous random tubular pores; very strongly acid; gradual wavy boundary.

Bt1—14 to 23 inches; yellowish brown (10YR 5/6) silt loam; common fine distinct brown (7.5YR 5/4) mottles and common fine prominent red (2.5YR 4/8) mottles; weak coarse subangular blocky structure; friable; few fine roots; few fine discontinuous random tubular pores; common distinct clay films on faces of peds; thin coatings of silt on vertical faces of peds; very strongly acid; gradual wavy boundary.

Bt2—23 to 30 inches; yellowish brown (10YR 5/6) silty clay loam; common fine distinct brown (7.5YR 5/4) mottles, many medium prominent red (2.5YR 4/8) mottles, and common medium distinct grayish brown (10YR 5/2) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm and slightly brittle; few fine roots; common distinct clay films on faces of peds; extremely acid; clear wavy boundary.

B/E—30 to 38 inches; yellowish brown (10YR 5/4) silty clay loam (Bt); common medium prominent red (2.5YR 4/8) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; gray (10YR 5/1) pockets and ped coatings of silt loam that make up about 15 percent of the horizon (E); few fine roots; common distinct clay films on faces of peds; few red (2.5YR 4/8) brittle accumulations about 1 inch thick; about 3 percent plinthite; very strongly acid; gradual wavy boundary.

Btv1—38 to 54 inches; yellowish brown (10YR 5/8) silty clay loam; few fine prominent red (2.5YR 4/8) mottles and common medium prominent gray (10YR 6/1) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few faint clay films on faces of peds; about 3 percent plinthite; extremely acid; gradual wavy boundary.

Btv2—54 to 72 inches; yellowish brown (10YR 5/8) silty clay loam; many medium prominent red (2.5YR 4/8) mottles and few fine prominent gray (10YR 6/1) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few faint clay films on faces of peds; about 3 percent plinthite; very strongly acid.

The thickness of the solum ranges from 60 to 100 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The Ap horizon has value of 4 or 5 and chroma of 2. It is 4 to 7 inches thick. Reaction ranges from very strongly acid to moderately acid.

The E horizon and the E part of the B/E horizon have value of 5 or 6 and chroma of 2 or 3. Thickness of the E horizon ranges from 2 to 6 inches. Some pedons do not have an E horizon. Reaction ranges from extremely acid to moderately acid. The E part of the B/E horizon makes up about 5 to 15 percent of the B/E horizon.

The BE and Bt horizons and the Bt part of the B/E horizon have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 6. Texture is silt loam or silty clay loam. Mottles, in shades of gray, brown, or red, range from few to many and from fine to coarse. Reaction ranges from extremely acid to moderately acid.

The Btv horizon and BC horizon, if it occurs, have the same range in colors as the Bt horizon, or they have value of 5 or 6 and chroma of 1 or 2. Mottles, in shades of red, brown, or gray, range from few to many and from fine to coarse. Reaction ranges from extremely acid to moderately acid.

Gore Series

The Gore series consists of moderately well drained, very slowly permeable soils that formed in loamy and clayey sediments of Pleistocene age. These soils are on terraces. Slopes range from 1 to 5 percent. The soils of the Gore series are fine, mixed, thermic Vertic Paleudalfs.

The Gore soils in Jefferson Davis Parish are taxadjuncts to the Gore series because they are Hapludalfs rather than Paleudalfs. This is because of stratification in the lower part of the profile. This difference, however, does not significantly affect the use and management of the soils.

Gore soils commonly are near the Acadia, Basile, Crowley, Kaplan, and Kinder soils. The somewhat poorly drained Acadia, Crowley, and Kaplan soils are less sloping than the Gore soils. The Acadia and Crowley soils have a subsoil that is brownish in the upper part. The Kaplan soils have a grayish subsoil. The poorly drained Basile soils are on narrow flood plains and are fine-silty. The poorly drained Kinder soils are on broad flats and are fine-silty.

Typical pedon of Gore silt loam, 1 to 5 percent slopes; 2.75 miles east of Elton, 1,100 feet east of

Chretien Cemetery, 75 feet north of pipeline right-of-way; SE1/4NW1/4 sec. 2, T. 7 S., R. 3 W.

A—0 to 4 inches; brown (10YR 5/3) silt loam; moderate medium granular structure; friable; many common and medium roots; moderately acid; abrupt smooth boundary.

Bt—4 to 15 inches; yellowish red (5YR 5/6) clay; many medium distinct strong brown (7.5YR 5/6) mottles and few fine distinct grayish brown (10YR 5/2) mottles; moderate medium and fine subangular blocky structure; very firm; plastic and sticky; common medium and coarse roots; common faint clay films on faces of peds; moderately acid; gradual wavy boundary.

Bssl—15 to 28 inches; yellowish red (5YR 4/6) clay; moderate medium and coarse subangular blocky structure; very firm; plastic and sticky; few fine roots; few faint clay films on faces of peds; few fine black stains; common shiny pressure faces and slickensides; slightly acid; abrupt wavy boundary.

Bss2—28 to 32 inches; yellowish red (5YR 5/6) clay; few fine prominent light gray (5Y 6/1) mottles; moderate medium subangular blocky structure; very firm; plastic and sticky; few faint clay films on faces of peds; many shiny pressure faces and slickensides; neutral; gradual wavy boundary.

BCk1—32 to 39 inches; yellowish red (5YR 4/6) silty clay loam; common medium prominent greenish gray (5GY 6/1) mottles; weak coarse prismatic structure; firm; few fine roots; few fine pores; many shiny pressure faces; common fine nodules of calcium carbonate; moderately alkaline; gradual wavy boundary.

BCk2—39 to 49 inches; stratified yellowish red (5YR 5/6) and greenish gray (5GY 6/1) silty clay loam; common medium distinct gray (5Y 5/1) mottles; massive; firm; plastic; common fine pores; few shiny ped faces; few horizontal streaks of powdery calcium carbonate and common fine and medium nodules of calcium carbonate; strongly alkaline; gradual wavy boundary.

BCk3—49 to 63 inches; yellowish red (5YR 5/6) stratified silt loam and silty clay loam; common coarse prominent greenish gray (5GY 6/1) mottles; massive; friable; common fine continuous pores lined with calcium carbonate; few pockets and streaks of greenish gray (5GY 6/1) silty clay loam; common accumulations of soft powdery calcium carbonate; common fine and medium nodules of calcium carbonate; accumulations of calcium carbonate concentrated in light gray (5Y 6/1) strata as thick as 1 inch; strongly alkaline; gradual wavy boundary.

2C—63 to 74 inches; yellowish red (5YR 5/6) loam; common medium and coarse prominent greenish gray (5GY 6/1) mottles; massive; friable; common fine pores lined with calcium carbonate; few thin bedding planes; few fine nodules of calcium carbonate; very strongly alkaline.

The thickness of the solum ranges from 40 to 60 inches.

The A horizon has value of 3 to 5 and chroma of 1 to 3. It is 2 to 4 inches thick. Reaction ranges from very strongly acid to moderately acid.

The E horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 2 or 3. It is as thick as 5 inches in some pedons. Texture of the E horizon is silt loam or very fine sandy loam. Reaction ranges from very strongly acid to moderately acid.

The Bt and Bss horizons have hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 6. Texture is silty clay or clay. Reaction ranges from very strongly acid to neutral. Mottles, in shades of red or brown, range from none to many.

The BCk horizon is in shades of red and gray. Texture is silt loam, silty clay loam, or clay. Reaction ranges from slightly alkaline to strongly alkaline. There are common or many nodules of calcium carbonate.

The C and 2C horizons are in shades of red and gray. Texture is loam, silt loam, or silty clay loam. Reaction ranges from slightly alkaline to very strongly alkaline.

Guyton Series

The Guyton series consists of poorly drained, slowly permeable soils that formed in loamy sediments of Pleistocene age. These soils are on flood plains and terraces. They are subject to flooding. Slope is less than 1 percent. The soils of the Guyton series are fine-silty, siliceous, thermic Typic Glossaqualfs.

Guyton soils commonly are near the Basile, Bienville, Caddo, Cahaba, Glenmora, Kinder, and Messer soils. The Basile soils are on flood plains in positions similar to those of the Guyton soils, and they are alkaline in the lower part of the subsoil. The Bienville and Cahaba soils are in higher positions. The Bienville soils are sandy throughout, and the Cahaba soils are fine-loamy. The Caddo and Kinder soils are on terraces in positions similar to those of the Guyton soils, and they have red mottles in the subsoil. The Glenmora soils are on ridgetops and side slopes, and they have a subsoil that is brownish in the upper part. The Messer soils are on mounds or smoothed mound areas, have a brownish subsoil, and are coarse-silty.

Typical pedon of Guyton silt loam, occasionally flooded; 2.75 miles east of Topsy, 1,700 feet northeast of Parish Road 9-56, 150 feet south of gas pipeline; NE1/4SW1/4 sec. 27, T. 7 S., R. 7 W.

A—0 to 5 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; common medium and fine roots and few coarse roots; dark yellowish brown oxidation stains around root channels; extremely acid; clear smooth boundary.

Eg1—5 to 17 inches; light brownish gray (10YR 6/2) silt loam; few fine prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine tubular pores; common root channels with yellowish brown (10YR 5/8) oxidation stains; extremely acid; clear wavy boundary.

Eg2—17 to 29 inches; light brownish gray (10YR 6/2) silt loam; few fine distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; few fine roots; few fine and medium tubular pores; common root channels and ped faces with dark yellowish brown (10YR 4/4) oxidation stains; extremely acid; clear irregular boundary.

B/E—29 to 50 inches; grayish brown (10YR 5/2) silty clay loam (Bt) and tongues of light brownish gray (10YR 6/2) silt loam (E) that make up about 20 percent of the horizon; few fine prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; few fine roots; common tubular pores; common distinct clay films on faces of peds in Bt part; common fine iron and manganese concretions; common light gray (10YR 7/1) silt coatings on faces of peds; extremely acid; clear wavy boundary.

Btg—50 to 80 inches; light brownish gray (10YR 6/2) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; common fine tubular pores; common distinct clay films on faces of peds; common fine iron and manganese concretions; common light gray (10YR 7/1) coatings of silt on vertical faces of peds; very strongly acid; clear wavy boundary.

Cg—80 to 90 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; few thin greenish gray (5BG 6/1) strata; common iron and manganese concretions; very strongly acid.

The thickness of the solum ranges from 50 to 80 inches. Typically, in at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 4 to 6 and chroma of 2 or 3. Thickness ranges from 2 to 8 inches. Reaction ranges from extremely acid to moderately acid.

The Eg horizon and the E part of the B/E horizon have value of 5 to 7 and chroma of 1 or 2. Mottles, in shades of brown, range from few to many. Texture is silt loam or very fine sandy loam. The thickness of the Eg horizon ranges from 11 to 27 inches. Reaction ranges from extremely acid to moderately acid.

The Btg horizon and Bt part of the B/E horizon have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Mottles, in shades of brown, range from few to many. Texture is silt loam, silty clay loam, or clay loam. Reaction ranges from extremely acid to moderately acid.

The Cg horizon has the same range in colors as the Btg horizon. Texture is silt loam, silty clay loam, clay loam, or sandy clay loam. Reaction ranges from very strongly acid to slightly acid.

Judice Series

The Judice series consists of poorly drained, very slowly permeable soils that formed in clayey sediments of Pleistocene age. These soils are on terraces of the Gulf Coast Prairies. They are subject to rare flooding. Slope is less than 1 percent. The soils of the Judice series are fine, montmorillonitic, thermic Vertic Haplaquolls.

Judice soils commonly are near the Ged, Kaplan, Leton, Midland, Morey, and Mowata soils. None of these soils has a mollic epipedon except for the Morey soils. The Ged soils are in freshwater marshes. The Kaplan soils are higher on the landscape than the Judice soils. The Leton and Midland soils are in landscape positions similar to those of the Judice soils. The Morey and Mowata soils are in slightly higher positions, and the Morey soils are fine-silty.

Typical pedon of Judice silty clay; 1 mile east of Thornwell, .25 mile west of Louisiana Highway 382, 150 feet north of Louisiana Highway 380; SW1/4SE1/4 sec. 9, T. 10 S., R. 4 W.

Ap—0 to 9 inches; black (10YR 2/1) silty clay; moderate medium and coarse subangular blocky structure parting to weak fine and medium granular; firm; many fine and medium roots; few dark brown (7.5YR 4/4) stains along root channels and on faces of peds; moderately acid; abrupt smooth boundary.

A—9 to 20 inches; very dark gray (10YR 3/1) silty clay; weak coarse subangular blocky structure parting to moderate medium and fine subangular blocky; firm; plastic and sticky; few fine roots; few fine pores; many shiny pressure faces on ped surfaces; common concretions of calcium carbonate as much as 3 inches across; common crawfish krotovinas 0.5 inch to 5 inches across; neutral; gradual wavy boundary.

Bssg1—20 to 40 inches; gray (10YR 5/1) silty clay; many coarse distinct yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; very firm; plastic and sticky; few fine roots; many shiny pressure faces; few coarse slickensides; common crawfish krotovinas 0.5 inch to 2 inches across; neutral; gradual wavy boundary.

Bssg2—40 to 49 inches; light gray (5Y 6/1) silty clay; many coarse prominent dark yellowish brown (10YR 4/6) mottles and few fine distinct dark brown (7.5YR 4/4) mottles; weak coarse subangular blocky structure; firm, sticky and plastic; few fine roots; few fine concretions of iron and manganese; common shiny pressure faces on ped surfaces; few slickensides 0.5 inch to 6 inches long; few crawfish krotovinas 0.5 inch to 2 inches across; neutral; gradual wavy boundary.

Bssg3—49 to 59 inches; light gray (5Y 6/1) silty clay; many coarse prominent olive (5Y 5/6) mottles; weak coarse prismatic structure; firm, plastic and sticky; few fine pores; dark brown (7.5YR 4/4) root channels filled with very dark gray (10YR 3/1) clay; common shiny ped faces; few large slickensides; few crawfish krotovinas 0.5 inch to 2 inches across; neutral; gradual wavy boundary.

Bssg4—59 to 70 inches; light gray (5Y 6/1) silty clay; common coarse prominent yellowish brown (10YR 5/4) and (10YR 5/6) mottles; weak coarse prismatic structure; firm, plastic and sticky; dark brown (7.5YR 4/4) root channels filled with very dark gray (10YR 3/1) clay; common shiny ped faces; few large slickensides; few crawfish krotovinas 0.5 inch to 2 inches across; neutral.

The thickness of the solum ranges from 50 to 80 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is 5 to 10 inches thick. Reaction ranges from moderately acid to neutral.

The A horizon has the same range in color and reaction as the Ap horizon. Texture is silty clay loam or silty clay. Thickness ranges from 5 to 14 inches. Concretions of calcium carbonate range from none to common.

The Bssg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. Mottles, in shades of brown or olive, range from few to many. Texture is silty clay loam, clay loam, or silty clay. Reaction ranges from slightly acid to moderately alkaline. Concretions of calcium carbonate range from none to common.

Kaplan Series

The Kaplan series consists of somewhat poorly drained, slowly permeable soils that formed in loamy and clayey sediments of Pleistocene age. These soils are on terraces of the Gulf Coast Prairies. Slopes range from 0 to 3 percent. The soils of the Kaplan series are fine, mixed, thermic Aeric Ochraqualfs.

Kaplan soils commonly are near the Acadia, Crowley, Gore, Judice, Midland, Morey, and Mowata soils. The Acadia soils are on side slopes in positions similar to those of the Kaplan soils and are acid throughout. The Crowley soils are slightly higher on the landscape, and they have an abrupt textural change from the albic horizon to the argillic horizon. The Gore soils are on steeper side slopes than the Kaplan soils, and they have a reddish subsoil. The Judice, Midland, Morey, and Mowata soils are lower on the landscape. The Judice and Morey soils have a mollic epipedon. The Midland and Mowata soils do not have red mottles in the upper part of the subsoil.

Typical pedon of Kaplan silt loam, 0 to 1 percent slopes; 3.6 miles southwest of Thornwell, 4,100 feet south of Highway 14, 200 feet east of dirt road; SW1/4SW1/4 sec. 29, T. 11 S., R. 4 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; moderate coarse granular structure; friable; common fine and medium roots; common yellowish brown (10YR 5/8) stains along root channels; strongly acid; abrupt smooth boundary.

A—7 to 14 inches; dark gray (10YR 4/1) silt loam; massive; firm and compacted; few fine roots; few fine distinct root channels with dark yellowish brown (10YR 4/4) oxidation stains; neutral; abrupt smooth boundary.

Btg—14 to 20 inches; dark gray (10YR 4/1) silty clay; common fine prominent yellowish brown (10YR 5/6) and red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; few faint gray clay films on faces of peds; few fine black concretions of iron and manganese; neutral; gradual wavy boundary.

Btkg1—20 to 29 inches; gray (10YR 5/1) silty clay; few fine prominent yellowish brown (10YR 5/6) and red (2.5YR 4/8) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; many distinct gray (10YR 5/1) and dark gray (10YR 4/1) clay films on faces of peds; few fine concretions of calcium carbonate; slightly alkaline; gradual wavy boundary.

Btkg2—29 to 37 inches; light olive brown (2.5Y 5/4) silty clay ped interiors with gray (10YR 5/1) ped surfaces; gray (10YR 5/1) also makes up about 20 percent of the matrix; few fine distinct yellowish brown (10YR 5/6) mottles; common fine prominent red (2.5YR 4/8) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common fine vesicular pores; many distinct gray (10YR 5/1) and dark gray (10YR 4/1) clay films on faces of peds; few fine concretions of calcium carbonate; slightly alkaline; gradual wavy boundary.

Btkg3—37 to 51 inches; gray (10YR 5/1) silty clay; common fine prominent yellowish brown (10YR 5/6) mottles; common medium distinct light olive brown (2.5Y 5/4) mottles; moderate coarse prismatic structure parting to weak medium subangular blocky; firm; common fine vesicular pores; many distinct gray (10YR 5/1) clay films on faces of peds; common medium and coarse black concretions of iron and manganese; common medium white concretions of calcium carbonate; moderately alkaline; gradual wavy boundary.

Btkg4—51 to 69 inches; light gray (10YR 6/1) silty clay; common medium prominent yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure; firm; common fine vesicular pores; common faint clay films on faces of peds; common root channels with dark gray (10YR 4/1) oxidation stains; few fine and medium black concretions of iron and manganese; common medium and coarse white concretions of calcium carbonate; moderately alkaline; gradual wavy boundary.

Btkg5—69 to 79 inches; light gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure; firm; few faint clay films on faces of peds; few root channels with dark gray (10YR 4/1) oxidation stains; few fine black concretions of iron and manganese; few coarse white concretions of calcium carbonate; slightly alkaline.

The thickness of the solum ranges from 40 to 85 inches.

The Ap and A horizons have value of 3 or 4 and chroma of 1 to 3. Where the value is 3, thickness of the horizon is less than 7 inches. Reaction ranges from strongly acid to moderately alkaline. Mottles are in shades of brown and range from none to common.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. Chroma of 2 is only in ped interiors. Mottles are in shades of red or brown. Reaction ranges from neutral to moderately alkaline. Texture is silty clay loam or silty clay.

The Btkg horizon dominantly has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2. Subhorizons of the Btkg horizon that have ped interiors with chroma of 3 or 4 are within a depth of 30 inches from the surface. Mottles are in shades of brown or red. Coatings on faces of peds are gray or dark gray. The Btkg horizon is slightly alkaline or moderately alkaline. Carbonate concretions range from few to many. Texture is silty clay loam or silty clay.

Kinder Series

The Kinder series consists of poorly drained, slowly permeable soils that formed in loamy sediments of Pleistocene age. These soils are in broad flats on terraces of the Gulf Coast Prairies. Slope is less than 1 percent. Soils of the Kinder series are fine-silty, siliceous, thermic Typic Glossaqualfs.

Kinder soils commonly are near the Acadia, Basile, Crowley, Glenmora, Guyton, Messer, Mowata, and Vidrine soils. The Acadia, Crowley, and Mowata soils have a fine-textured control section. The Acadia soils are on side slopes, the Crowley soils are on ridges, and the Mowata soils are on lower parts of the landscape than the Kinder soils. The Basile soils are on flood plains and are alkaline in the lower part of the subsoil. The Glenmora soils are on ridgetops and side slopes, and they have a brownish subsoil. The Guyton soils are in lower positions and do not have red mottles in the subsoil. The Messer soils are on mounds or smoothed mound areas, and the Vidrine soils are on side slopes, mounds, and smoothed mound areas. The Messer soils are coarse-silty, and the Vidrine soils are coarse-silty over clayey.

Typical pedon of Kinder silt loam, in an area of Kinder-Messer silt loams; 3 miles southwest of Indian Village, 1 mile south of Grays Bluff, 15 feet south of dirt road; NE$^1/_4$NE$^1/_4$ sec. 36, T. 7 S., R. 7 W.

A—0 to 4 inches; dark gray (10YR 4/1) silt loam;

weak fine granular structure; friable; many fine roots; few fine light gray (10YR 7/1) pockets of silt; extremely acid; abrupt smooth boundary.

Eg—4 to 19 inches; grayish brown (10YR 5/2) silt loam; common medium distinct light yellowish brown (10YR 6/4) mottles and few fine prominent yellowish brown (10YR 5/8) mottles; massive; friable; common fine roots; many fine tubular pores; few fine black and brown concretions; common strong brown (7.5YR 5/6) stains along root channels; very strongly acid; abrupt irregular boundary.

B/E—19 to 28 inches; grayish brown (10YR 5/2) silty clay loam (Bt); common medium prominent red (2.5YR 4/8) mottles and common fine distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; few fine pores; few distinct clay films on faces of peds; tongues of grayish brown (10YR 5/2) silt loam (E) that make up about 20 percent of the horizon; very strongly acid; clear irregular boundary.

Btg1—28 to 40 inches; grayish brown (10YR 5/2) silty clay loam; common medium prominent red (2.5YR 4/8) mottles and few fine distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; few fine pores; many distinct clay films and silt coatings on faces of peds; strongly acid; gradual wavy boundary.

Btg2—40 to 50 inches; light brownish gray (10YR 6/2) silty clay loam; few fine prominent yellowish brown (10YR 5/8) and red (2.5YR 4/8) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few fine roots; few fine pores; few fine root channels with yellowish brown (10YR 5/6) oxidation stains; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

E/B—50 to 65 inches; light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; firm; few faint clay films on faces of peds in Bt part; few fine nodules of iron and manganese; few very fine root channels with yellowish brown (10YR 5/6) oxidation stains; moderately acid; clear irregular boundary.

B´/E—65 to 80 inches; light brownish gray (2.5Y 6/2) silty clay loam (Bt); few fine distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; few faint clay films on faces of peds in B´t part; common soft accumulations of iron and manganese; tongues of gray (10YR 6/1) silt loam (E) make up about 20 percent of this horizon; moderately acid; clear irregular boundary.

B´tg—80 to 88 inches; light brownish gray (2.5Y 6/2) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; few faint clay films on faces of peds; common soft accumulations of iron and manganese; moderately acid.

The thickness of the solum ranges from 50 to 75 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 4 or 5 and chroma of 1 or 2. It is 3 to 8 inches thick. Reaction ranges from extremely acid to moderately acid.

The Eg horizon has value of 5 or 6 and chroma of 1 or 2. Texture is silt loam, loam, or very fine sandy loam. Reaction ranges from very strongly acid to moderately acid.

The Btg horizon and Bt part of the B/E horizon have value of 4 to 6 and chroma of 1 or 2. Mottles in shades of red and brown range from few to many. Texture is loam, clay loam, or silty clay loam. Reaction ranges from very strongly acid to slightly acid.

The B´tg horizon and Bt part of the B´/E horizon have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is silt loam, loam, or silty clay loam. Reaction ranges from very strongly acid to moderately alkaline. Mottles in shades of brown range from few to many.

Leton Series

The Leton series consists of poorly drained, slowly permeable soils that formed in loamy sediments of Pleistocene age. These soils are on terraces of the Gulf Coast Prairies. They are subject to flooding. Slope is less than 1 percent. Soils of the Leton series are fine-silty, mixed, thermic Typic Glossaqualfs.

Leton soils commonly are near the Crowley, Judice, Kaplan, Midland, Morey, Mowata, Pineisland, and Vidrine soils. The Crowley, Judice, Kaplan, Midland, and Mowata soils have a fine-textured control section. The Crowley and Kaplan soils are on ridges. The Judice and Midland soils are in positions similar to those of the Leton soils. The Morey and Mowata soils are in higher positions. The Morey soils have a mollic epipedon. The moderately well drained Pineisland soils are on side slopes of relict natural levees and have a fragipan. The Vidrine soils are on low mounds or smoothed mound areas and on side slopes, and they are coarse-silty over clayey.

Typical pedon of Leton silt loam; 2.25 miles southeast of Iowa, 2,400 feet south of Parish Road 8-28, 150 feet east of drainage canal; SE1/4NW1/4sec. 3, T. 10 S., R. 6 W.

Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; many fine roots; common pockets and lenses of uncoated grains of very fine sand; very strongly acid; abrupt smooth boundary.

Eg—7 to 28 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable; few fine roots; few fine tubular pores; few spots of uncoated very fine sand; few faint dark gray coatings on faces of peds; dark yellowish brown (10YR 4/4) oxidation stains along root channels; moderately acid; gradual wavy boundary.

B/E—28 to 45 inches; light brownish gray (10YR 6/2) silty clay loam (Bt); tongues of gray (10YR 6/1) loam (E) that make up 35 percent of the horizon; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium and fine subangular blocky; friable; few distinct clay films on faces of peds in Bt part; common faint dark gray (10YR 4/1) and dark yellowish brown (10YR 4/4) stains along root channels; common faint dark gray (10YR 4/1) coatings on prism faces; few small spots of uncoated very fine sand; common fine faint light gray (10YR 7/1) silt pockets; moderately acid; clear wavy boundary.

Btg—45 to 59 inches; light brownish gray (10YR 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure parting to weak medium and fine subangular blocky; firm; about 15 percent light gray (10YR 7/1) silt loam between prisms; many faint clay films and common distinct coatings of silt on faces of peds; slightly acid; gradual wavy boundary.

BCg—59 to 75 inches; light brownish gray (10YR 6/2) silty clay loam; few medium prominent yellowish brown (10YR 5/8) mottles; weak coarse and medium subangular blocky structure; firm; common medium faint pockets of light brownish gray (10YR 6/2) silt loam; slightly acid; gradual wavy boundary.

Cg—75 to 86 inches; light brownish gray (10YR 6/2) clay loam; few coarse prominent yellowish brown (10YR 5/8) mottles; massive; firm; neutral.

The thickness of the solum ranges from 50 to 80 inches or more. The content of sand in the control section ranges from 15 to 42 percent, and less than 15 percent is fine sand or coarser.

The Ap horizon has value of 4 or 5 and chroma of 1 or 2. It is 3 to 7 inches thick. Reaction ranges from very strongly acid to neutral.

The Eg horizon has value of 5 or 6 and chroma of 1 or 2. Texture is silt loam, loam, or very fine sandy loam. Reaction ranges from very strongly acid to neutral. Thickness ranges from 10 to 23 inches.

The Btg horizon and the Bt part of the B/E horizon have value of 5 or 6 and chroma of 1 or 2. Mottles in shades of brown range from few to many. Texture is loam, silty clay loam, or clay loam. Reaction ranges from moderately acid to slightly alkaline in the B/E horizon and from moderately acid to moderately alkaline in the Btg horizon.

The BCg and Cg horizons have value of 5 to 7 and chroma of 1 or 2. Mottles range from none to common in shades of brown. Texture is loam, silt loam, clay loam, or silty clay loam. Reaction ranges from moderately acid to moderately alkaline.

Messer Series

The Messer series consists of moderately well drained, slowly permeable soils that formed in loamy sediments of Pleistocene age. These soils are on terraces of the Gulf Coast Prairies. Slopes range from 0 to 5 percent. Soils of the Messer series are coarse-silty, siliceous, thermic Haplic Glossudalfs.

Messer soils commonly are near the Acadia, Caddo, Glenmora, Guyton, and Kinder soils. The Acadia soils are on nearby side slopes and have a fine-textured control section. The Caddo, Guyton, and Kinder soils are lower on the landscape than the Messer soils and are fine-silty. The Glenmora soils are on side slopes and are fine-silty.

Typical pedon of Messer silt loam, in an area of Kinder-Messer silt loams; 3.25 miles southwest of Indian Village, 1.25 miles south of Grays Bluff, 30 feet south of gas pipeline; SE1/4NE1/4 sec. 36, T. 7 S., R. 7 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many fine and very fine roots; common coarse roots; common fine black concretions; extremely acid; clear smooth boundary.

E—4 to 8 inches; light yellowish brown (10YR 6/4) silt loam; weak fine granular structure; very friable; many fine and very fine roots and common medium roots; few very fine discontinuous random tubular pores; common fine black concretions; very strongly acid; clear smooth boundary.

Bw1—8 to 19 inches; light yellowish brown (10YR 6/4) silt loam; common coarse pale brown (10YR 6/3) vertical streaks; weak coarse subangular blocky structure; friable; few medium and very fine roots; many very fine discontinuous random tubular pores; many fine and medium black and brown concretions; very strongly acid; clear irregular boundary.

Bw2—19 to 34 inches; light yellowish brown (10YR 6/4) silt loam; common fine faint very pale brown (10YR 7/3) mottles; common coarse pale brown (10YR 6/3) vertical streaks; weak coarse subangular blocky structure; friable; few medium and very fine roots; many very fine discontinuous random tubular pores; many fine and medium black and brown concretions; very strongly acid; clear irregular boundary.

B/E—34 to 40 inches; pale brown (10YR 6/3) silty clay loam (Bt); common medium prominent red (2.5YR 4/8) mottles and common fine distinct brownish yellow (10YR 6/6) mottles; weak coarse prismatic structure parting to weak coarse blocky; firm and slightly brittle; few very fine roots between peds; common very fine discontinuous random tubular pores; few faint clay films on faces of peds; tongues and ped coatings of light gray (10YR 6/2) silt loam (E) that make up about 25 percent of the horizon; very strongly acid; gradual wavy boundary.

Bt1—40 to 58 inches; brown (10YR 5/3) silty clay loam; many medium prominent strong brown (2.5YR 4/8) mottles and common fine distinct brownish yellow (10YR 6/6) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few fine roots; many very fine discontinuous random tubular pores; few faint clay films on faces of peds; few distinct light brownish gray (10YR 6/2) coatings of silt on faces of some peds; less than 5 percent plinthite; common medium brown and black concretions; extremely acid; gradual wavy boundary.

Bt2—58 to 72 inches; brown (10YR 5/3) silty clay loam; common medium prominent red (2.5YR 4/8) mottles and few fine distinct brownish yellow (10YR 6/6) mottles; weak coarse subangular blocky structure; few faint clay films on faces of peds; few fine iron and manganese concretions; very strongly acid.

The thickness of the solum ranges from 60 to 100 inches. In at least one subhorizon within a depth of 30 inches, the level of exchangeable aluminum is 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 4 or 5 and chroma of 2 or 3. It is 2 to 7 inches thick. Reaction ranges from extremely acid to moderately acid.

The E horizon and the E part of the B/E horizon have value of 5 or 6 and chroma of 3 or 4. The E horizon is 3 or 4 inches thick. Texture is silt loam or very fine sandy loam. Reaction ranges from very strongly acid to moderately acid.

The Bw horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 6. Texture is silt loam, loam, or very fine sandy loam. Reaction ranges from very strongly acid to moderately acid.

The Bt horizon and the Bt part of the B/E horizon have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 6. Mottles are in shades of red, yellow, or gray. Texture is loam, silty clay loam, or clay loam. Grayish silt tongues and ped coatings (E material) make up about 15 to 50 percent of the B/E horizon. Reaction ranges from extremely acid to moderately acid.

The BC horizon, if it occurs, is in shades of gray, brown, or olive. Texture is loam, silt loam, silty clay loam, or clay loam.

Midland Series

The Midland series consists of poorly drained, very slowly permeable soils that formed in loamy and clayey sediments of Pleistocene age. These soils are on terraces of the Gulf Coast Prairies. Slope is less than 1 percent. The soils of the Midland series are fine, montmorillonitic, thermic Typic Ochraqualfs.

Midland soils commonly are near the Crowley, Judice, Kaplan, Leton, Morey, and Mowata soils. The Crowley and Kaplan soils are higher on the landscape than the Midland soils. The Crowley soils have an abrupt textural change between the subsurface and subsoil layers, and the Kaplan soils have red mottles in the upper part of the subsoil. The Judice and Leton soils are in landscape positions similar to those of the Midland soils. The Judice soils have a mollic epipedon, and the Leton soils are fine-silty. The Morey and Mowata soils are higher on the landscape than the Midland soils. The Morey soils are fine-silty, and the Mowata soils have an albic horizon that tongues into the argillic horizon.

Typical pedon of Midland silt loam; 1.5 miles north of Welsh, 180 feet south of Parish Road 6-32, 150 feet west of Parish Road 6-21; NE1/4NE1/4 sec. 19, T. 9 S., R. 4 W.

Ap—0 to 6 inches; dark gray (10YR 4/1) silt loam;

common fine distinct dark brown (7.5YR 4/4) mottles; weak medium and fine granular structure; firm; many fine roots; slightly acid; abrupt smooth boundary.

Btg1—6 to 14 inches; dark gray (10YR 4/1) silty clay loam; few fine prominent strong brown (7.5YR 5/6) mottles and few fine distinct brown (10YR 5/3) mottles; weak coarse subangular blocky structure; firm; few fine roots; common faint very dark gray (10YR 3/1) coatings on some ped surfaces; few faint clay films on faces of peds; neutral; gradual wavy boundary.

Btg2—14 to 19 inches; dark gray (10YR 4/1) silty clay loam; few fine prominent reddish brown (5YR 4/4) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; plastic; few fine roots; many distinct clay films on faces of peds; few vertical cracks as much as 1 inch wide filled with black (10YR 2/1) silty clay loam; few fine iron and manganese concretions; neutral; gradual wavy boundary.

Btg3—19 to 30 inches; gray (10YR 5/1) silty clay; common medium faint grayish brown (10YR 5/2) mottles; weak coarse subangular blocky structure; firm; plastic and sticky; few fine roots; few fine iron and manganese concretions; many distinct clay films on faces of peds; few vertical cracks filled with black (10YR 2/1) silty clay loam; neutral; gradual wavy boundary.

Btg4—30 to 41 inches; gray (10YR 5/1) silty clay; few fine distinct yellowish brown (10YR 5/4) mottles; weak coarse subangular blocky structure parting to weak medium and fine subangular blocky; very firm; plastic and sticky; few fine roots; few fine iron and manganese concretions; many distinct clay films on faces of peds; few vertical cracks filled with black (10YR 2/1) silty clay loam; neutral; gradual wavy boundary.

Btg5—41 to 52 inches; gray (5Y 5/1) silty clay; many fine distinct olive (5Y 5/3) mottles and few fine prominent yellowish brown (10YR 5/4) mottles; weak coarse subangular blocky structure; very firm; plastic and sticky; few fine iron and manganese concretions; common faint very dark gray (10YR 3/1) clay films on faces of peds; neutral; gradual wavy boundary.

Btg6—52 to 64 inches; gray (5Y 6/1) silty clay; many fine distinct light yellowish brown (2.5Y 6/4) mottles; weak coarse subangular blocky structure; very firm; plastic and sticky; few fine roots; common fine and medium iron and manganese concretions; few faint clay films on faces of peds; slightly alkaline; gradual wavy boundary.

BCkg—64 to 75 inches; gray (5Y 6/1) silty clay; common fine prominent brownish yellow (10YR 6/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; very firm; plastic and sticky; common fine calcium carbonate concretions and accumulations of powdery lime; few cracks filled with gray (10YR 5/1) silty clay; slightly alkaline.

The thickness of the solum ranges from 40 to 80 inches.

The Ap horizon has value of 4 or 5 and chroma of 1 or 2. It is 5 to 18 inches thick. Reaction ranges from strongly acid to neutral.

The Btg and BCkg horizons have hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or value of 6 and chroma of 2. Mottles are in shades of brown, yellow, or olive. Texture is clay, silty clay, or silty clay loam. Reaction ranges from strongly acid to moderately alkaline. Carbonate concretions are none or few in the Btg horizon and few or common in the BCkg horizon.

Morey Series

The Morey series consists of poorly drained, slowly permeable soils that formed in loamy sediments of Pleistocene age. These soils are on broad flats on terraces of the Gulf Coast Prairies. They are subject to rare flooding. Slope is less than 1 percent. Soils of the Morey series are fine-silty, mixed, thermic Typic Argiaquolls.

The Morey soils in Jefferson Davis Parish are taxadjuncts to the Morey series because they have siliceous mineralogy rather than mixed. This difference, however, does not significantly affect the use and management of the soils.

Morey soils commonly are near the Crowley, Judice, Kaplan, Leton, Midland, Mowata, and Vidrine soils. None of these soils, except for the Judice soils, has a mollic epipedon. The Judice soils have a fine-textured control section. The Crowley and Kaplan soils are higher on the landscape than the Morey soils. The Judice, Leton, and Midland soils are on the lower parts of the landscape. The Mowata soils are in positions similar to those of the Morey soils. The Vidrine soils are on side slopes and on mounds or smoothed mound areas.

Typical pedon of Morey loam; 4.5 miles south of Iowa, 2,100 feet north of Parish Road 8-18, 3,600 feet west of Parish Road 8-383; NE1/4SE1/4 sec. 16, T. 10 S., R. 6 W.

Ap—0 to 6 inches; very dark gray (10YR 3/1) loam; weak fine granular structure; friable; many fine roots; common distinct pockets of gray (10YR 5/1) silt loam; slightly acid; abrupt smooth boundary.

BA—6 to 19 inches; very dark gray (10YR 3/1) loam; few fine distinct dark yellowish brown (10YR 4/4) mottles; weak coarse subangular blocky structure; firm, compacted pan; common fine roots; few fine pores; few fine and medium iron and manganese concretions; crawfish krotovinas 1 to 6 inches wide and filled with dark gray (10YR 4/1) silty clay loam; neutral; gradual wavy boundary.

Btg1—19 to 29 inches; dark gray (10YR 4/1) clay loam; common fine and medium prominent light olive brown (2.5Y 5/6) mottles and few fine faint grayish brown mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few fine roots; few fine pores; few faint clay films on faces of peds; few cracks between prisms filled with very dark gray (10YR 3/1) silt loam; crawfish krotovinas 1 to 6 inches wide are filled with very dark gray (10YR 3/1) silty clay loam; slightly acid; gradual wavy boundary.

Btg2—29 to 36 inches; gray (10YR 5/1) clay loam; common medium prominent light olive brown (2.5Y 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; few fine pores; many distinct clay films on faces of peds; shiny pressure faces on some peds; crawfish krotovinas 1 to 6 inches wide and filled with very dark gray (10YR 3/1) silty clay loam; slightly acid; gradual wavy boundary.

Btg3—36 to 62 inches; gray (10YR 6/1) clay loam; many medium prominent brownish yellow (10YR 6/8) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few fine pores; many distinct clay films on faces of peds; few root channels filled with dark gray (10YR 4/1) material; crawfish krotovinas 1 to 6 inches wide and filled with dark gray (10YR 4/1) and very dark gray (10YR 3/1) silty clay loam; slightly acid; gradual wavy boundary.

Btg4—62 to 73 inches; gray (10YR 6/1) clay loam; common medium prominent brownish yellow (10YR 6/8) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky structure; firm; many distinct clay films on faces of peds; common root channels filled with dark gray (10YR 4/1) material; few fine and medium red and black concretions; crawfish krotovinas 1 to 6 inches wide and filled with dark gray (10YR 3/1) silty clay loam; slightly acid; gradual wavy boundary.

Btg5—73 to 80 inches; gray (5Y 6/1) clay loam; many coarse prominent yellowish red (5YR 5/6) mottles; weak coarse prismatic and weak medium subangular blocky structure; firm; few fine pores; common root channels filled with dark gray (10YR 4/1) material; few faint clay films on faces of peds; common fine black accumulations; few fine and medium black and red concretions; neutral.

The thickness of the solum ranges from 60 to more than 80 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is 6 to 10 inches thick. Reaction ranges from strongly acid to neutral.

The BA horizon has the same range in colors and reaction as the Ap horizon. Texture is silt loam, loam, or silty clay loam.

The Btg1 and Btg2 horizons have hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1. Texture is silty clay loam or clay loam. Reaction ranges from moderately acid to slightly alkaline.

The Btg3, Btg4, and Btg5 horizons have hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2. Texture is silty clay loam, silty clay, or clay loam. Some pedons contain concretions of calcium carbonate below a depth of 40 inches. Reaction ranges from moderately acid to moderately alkaline.

Mowata Series

The Mowata series consists of poorly drained, very slowly permeable soils that formed in loamy and clayey sediments of Pleistocene age. These soils are on terraces of the Gulf Coast Prairies. Slope is less than 1 percent. The soils of the Mowata series are fine, montmorillonitic, thermic Typic Glossaqualfs.

Mowata soils commonly are near the Crowley, Judice, Kaplan, Leton, Midland, Morey, and Vidrine soils. The Crowley and Kaplan soils are higher on the landscape than the Mowata soils. The Crowley soils have an abrupt textural change from the E horizon to the Btg horizon. The Kaplan soils have red mottles in the upper part of the subsoil and are alkaline in the lower part of the subsoil. The Judice, Leton, and Midland soils are in the lower parts of the landscape. The Judice soils have a mollic epipedon, the Leton soils are fine-silty, and the Midland soils do not have a subsurface layer that extends into the subsoil. The Morey soils are in landscape positions similar to those of the Mowata soils, and they have a mollic epipedon. The Vidrine soils are on mounds or smoothed mound areas and on side slopes. They are coarse-silty over clayey.

Typical pedon of Mowata silt loam; 5 miles north of Lacassine, 0.5 mile west of Parish Road 6-10-A, 105 feet south of Parish Road 5-40; NW1/4NW1/4 sec. 5, T. 9 S., R. 5 W.

Ap1—0 to 4 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; common fine roots; strong brown (7.5YR 5/6) oxidation stains along root channels; strongly acid; abrupt smooth boundary.

Ap2—4 to 8 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; common fine roots; few fine distinct yellowish brown (10YR 5/6) oxidation stains along root channels; few fine gray (10YR 6/1) silt pockets; strongly acid; abrupt smooth boundary.

Eg1—8 to 15 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable; few fine roots; few fine discontinuous tubular pores; common fine distinct dark yellowish brown (10YR 4/6) stains along root channels; few fine gray (10YR 6/1) silt pockets; strongly acid; clear wavy boundary.

Eg2—15 to 25 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable; few fine roots; few fine discontinuous pores; common fine gray (10YR 6/1) silt pockets; common manganese accumulations on prism faces; very strongly acid; abrupt irregular boundary.

B/E—25 to 34 inches; light brownish gray (2.5Y 6/2) silty clay; many medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; many fine distinct dark yellowish brown (10YR 4/6) stains along root channels; many distinct gray (10YR 6/1) coatings of silt on faces of peds; tongues of grayish brown (10YR 5/2) silt loam (E) make up about 25 percent of the horizon; few fine dark concretions; very strongly acid; clear wavy boundary.

Btg1—34 to 42 inches; light brownish gray (2.5Y 6/2) silty clay; common medium prominent yellowish brown (10YR 5/6) mottles; moderate coarse and medium subangular blocky structure; firm; few fine roots; many distinct clay films on faces of peds; common distinct gray (10YR 6/1) coatings of silt on faces of peds; few soft manganese accumulations; strongly acid; gradual wavy boundary.

Btg2—42 to 62 inches; light brownish gray (10YR 6/2) silty clay; few fine prominent light olive brown (2.5Y 5/6) mottles; weak medium subangular blocky structure; firm; few faint clay films on faces of peds; few fine manganese accumulations; moderately acid.

The thickness of the solum ranges from 40 to 80 inches or more. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The Ap horizon has value of 3 to 5 and chroma of 1 or 2. Where moist value is less than 3.5, the Ap horizon is less than 6 inches thick. Thickness ranges from 4 to 8 inches. Reaction ranges from strongly acid to neutral.

The Eg horizon has value of 5 or 6 and chroma of 1 or 2. It is 9 to 17 inches thick. Reaction ranges from very strongly acid to neutral.

The Btg horizon and Btg part of the B/E horizon have hue of 10YR, 2.5Y, or 5Y, value of 5, and chroma of 1 or value of 6 and chromas of 1 or 2. Texture is silty clay, silty clay loam, or clay loam. Reaction ranges from very strongly acid to moderately alkaline. Tongues of silt loam extend into the Btg horizon and range from 0.5 inch to 8 inches across.

Pineisland Series

The Pineisland series consists of moderately well drained, moderately slowly permeable soils that formed in loamy sediments of Pleistocene age. These soils are on relict natural levees on terraces of the Gulf Coast Prairies. Slopes range from 1 to 3 percent. Soils of the Pineisland series are fine-silty, siliceous, thermic Glossic Fragiudalfs.

Pineisland soils commonly are near the Crowley, Leton, and Mowata soils. The Crowley and Mowata soils are in slightly lower positions and have a fine-textured control section. The Leton soils are in lower positions, are poorly drained, and do not have a fragipan.

Typical pedon of Pineisland loam, 1 to 3 percent slopes; 4 miles east of Woodlawn, 300 feet north of Parish Road 6-10, 140 feet west of Parish Road 8-36; SE1/4SW1/4 sec. 5, T. 9 S., R. 5 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loam; few fine distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure parting to weak coarse granular; friable; common fine and medium roots; common very fine brownish stains along root channels; moderately acid; abrupt smooth boundary.

Ec—9 to 15 inches; dark yellowish brown (10YR 4/4) loam; massive; friable; many very fine and fine black and few brown concretions; many fine roots; few very fine vesicular pores; strongly acid; clear smooth boundary.

E/B—15 to 24 inches; yellowish brown (10YR 5/4) loam (E); dark brown (7.5YR 4/4) clay loam (Bt); the Bt part mostly medium and coarse prisms surrounded by a red (2.5YR 4/8) brittle rind 0.25 to 0.5 inch thick; the Bt part makes up about 40 percent of the horizon; moderate very coarse prismatic structure parting to weak very coarse subangular blocky and weak medium and coarse prismatic; friable; common fine and few medium roots; many very fine continuous pores; few faint clay films on faces of peds in Bt part; very strongly acid; gradual wavy boundary.

B/E—24 to 38 inches; brownish yellow (10YR 6/6) clay loam (Bt) in 4-to 7-inch diameter prisms; tongues
1 to 4 inches wide of yellowish brown (10YR 5/4) silt loam (E) that make up about 40 percent of the horizon; weak very coarse prismatic structure parting to weak very coarse subangular blocky and weak coarse prismatic; moderately brittle; few fine roots between prisms; few medium pores lined with clay films; thick brownish yellow (10YR 6/6) silt coatings on faces of peds; common pockets of silt that are surrounded by a red (2.5YR 4/6) brittle rind 0.25 to 0.5 inch thick; many soft accumulations of red and black on faces of prisms; few faint clay films on faces of peds; very strongly acid; diffuse irregular boundary.

Btx—38 to 48 inches; reddish yellow (7.5YR 6/6) and yellow (10YR 7/6) clay loam; weak very coarse prismatic structure; hard and brittle in about 90 percent of horizon; many fine and medium roots between prisms; prisms 4 to 7 inches in diameter that are surrounded by a red (2.5YR 4/6) rind 0.25 to 0.5 inch thick; grayish brown (10YR 5/2) clay seams between prisms; many thick light yellowish brown (10YR 6/4) silt coatings on faces of prisms; many fine and medium pores lined with distinct clay films; many distinct clay films on faces of peds; few soft black accumulations; very strongly acid; diffuse irregular boundary.

Bt1—48 to 66 inches; red (2.5YR 4/6) sandy clay loam; few fine distinct reddish brown (5YR 5/4) mottles; weak very coarse prismatic structure parting to weak coarse subangular blocky; friable; many fine and medium roots between prisms; few fine roots within prisms; common fine pores that have clay films; common medium pockets and streaks of strong brown (7.5YR 4/6) fine sandy loam and very fine sandy loam; few krotovina about 3 inches across filled with gray (10YR 5/1) silt loam; common distinct dark gray (10YR 4/1) clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—66 to 78 inches; red (2.5YR 5/8) sandy clay loam; many medium prominent yellowish brown (10YR 5/8) mottles and few fine prominent light yellowish brown (10YR 6/4) mottles; weak very coarse subangular blocky structure; friable; few fine roots between prisms; few fine and very fine medium pores lined with faint clay films; common fine black accumulations on faces of peds; common distinct very pale brown (10YR 7/3) clay films on faces of peds; root channels filled with soft black accumulations; very strongly acid.

The thickness of the solum ranges from 70 to 120 inches. Depth to the fragipan ranges from 24 to 59 inches. Reaction ranges from very strongly acid to slightly acid throughout. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The Ap horizon has value 4 to 5 and chroma of 2 or 3. Thickness ranges from 5 to 12 inches.

The Ec horizon has value of 4 to 6 and chroma of 4 to 6. Texture is silt loam or loam. Thickness ranges from 5 to 17 inches.

The E/B and B/E horizons have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 6. Texture is very fine sandy loam, loam, silt loam, silty clay loam, or clay loam.

The Btx and Bt horizons have hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 4 to 7, and chroma of 4 to 8. Texture is sandy clay loam, silty clay loam, clay loam, or loam.

The BC and C horizons, where present, have the same range in colors and reaction as the Btx and Bt horizons. Texture is loamy fine sand, fine sandy loam, loam, sandy clay loam, or clay loam.

Vidrine Series

The Vidrine series consists of moderately well drained and somewhat poorly drained, slowly permeable soils that formed in loamy and clayey sediments of Pleistocene age. These soils are on terraces of the Gulf Coast Prairies. Slopes range from

0 to 3 percent. The soils of the Vidrine series are coarse-silty over clayey, mixed, thermic Glossaquic Hapludalfs.

Vidrine soils commonly are near the Crowley, Kaplan, Kinder, Leton, Morey, Mowata, and Pineisland soils. The Crowley, Kaplan, and Mowata soils have a fine-textured control section. The Kinder, Leton, Morey, and Pineisland soils are fine-silty. The Pineisland soils are in high positions on side slopes of relict natural levees.

Typical pedon of Vidrine silt loam, in an area of Crowley-Vidrine silt loams, 0 to 1 percent slopes; 2 miles northeast of Welsh, 250 feet south of Parish Road 6-99-A, 1,800 feet east of Parish Road 6-21, 900 feet north of East Bayou Lacassine; NE$^1/_4$NW$^1/_4$ sec. 17, T. 9 S., R. 4 W.

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

BE—6 to 14 inches; brown (10YR 5/3) silt loam; weak medium subangular blocky structure; friable; few fine roots; common medium tubular pores; moderately acid; clear irregular boundary.

B/E—14 to 18 inches; grayish brown (10YR 5/2) silty clay (Bt); many fine prominent red (2.5YR 4/8) mottles and few medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds in Bt part; about 20 percent is interfingers of pale brown(10YR 6/3) silt loam (E); strongly acid; clear wavy boundary.

Btg1—18 to 46 inches; grayish brown (10YR 5/2) silty clay; many fine prominent red (2.5YR 4/8) mottles and common fine prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure parting to moderate fine subangular blocky; firm; many distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Btg2—46 to 65 inches; light brownish gray (10YR 6/2) silty clay; many medium prominent yellowish brown (10YR 5/8) mottles and few fine prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; few distinct clay films on faces of peds; moderately acid; gradual wavy boundary.

BCg—65 to 70 inches; light brownish gray (10YR 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; thick light brownish gray (10YR 6/2) silt coatings on ped surfaces; neutral.

The thickness of the solum ranges from 48 to 80 inches. Combined thickness of the A and BE horizons ranges from 14 to 22 inches where mounds are smoothed and from 20 to 30 inches in the natural state.

The Ap horizon has value of 3 to 5 and chroma of 2 or 3. Thickness ranges from 5 to 12 inches. Ap horizons that have a value of 3 are less than 6 inches thick. Reaction ranges from very strongly acid to moderately acid.

The BE horizon has value of 5 or 6 and chroma of 3 or 4. Texture is silt loam or very fine sandy loam. Reaction ranges from very strongly acid to moderately acid.

The Btg horizon and Btg part of the B/E horizon have value of 4 to 6 and chroma of 1 or 2. Texture is silty clay loam or silty clay. Reaction ranges from very strongly acid to moderately alkaline. Concretions of carbonates are in the lower part of the Btg horizon in some pedons.

The BCg horizon has value of 5 or 6 and chroma of 1 to 6. Texture is silty clay loam, silty clay, or silt loam. Reaction ranges from strongly acid to moderately alkaline.

Formation of the Soils

This section explains the processes and factors of soil formation and relates them to the soils in the survey area. In addition, the landforms and surface geology are described.

Processes of Soil Formation

The processes of soil formation influence the kind and degree of development of soil horizons. The factors of soil formation—climate, living organisms, relief, parent material, and time—determine the rate and relative effectiveness of the different processes.

Soil-forming processes are those that result in additions of organic, mineral, and gaseous materials to the soil; losses of these materials from the soil; translocation of materials from one point to another within the soil; and physical and chemical transformation of mineral and organic material within the soil *(21)*.

Many processes occur simultaneously, for example, the accumulation of organic matter, the development of soil structure, and the leaching of bases from some soil horizons. The contribution of a particular process can change over a period of time. The installation of drainage and water control systems, for example, can change the length of time some soils are flooded or saturated with water. Some processes that have contributed to the formation of the soils in Jefferson Davis Parish are discussed in the following paragraphs.

Organic matter has accumulated, has partly decomposed, and has been incorporated in all the soils. The organic accumulations range from the humus in mineral horizons of the Acadia and Guyton soils to the muck in organic horizons of the Allemands soils. Because most of the organic matter is produced in and above the surface layer, the surface layer is higher in organic matter content than the deeper horizons. Living organisms decompose, incorporate, and mix organic residue into the soil. Some of the more stable products of decomposition remain as finely divided materials that contribute to darker colors, increased water-holding and cation-exchange capacities, and granulation in the soil. As much as 4 feet of organic matter has accumulated on the surface of some soils in the marsh. Because these soils are continually saturated, aquatic vegetation grows well and large amounts are produced. This organic matter decomposes slowly and remains in the soil for long periods of time.

The addition of alluvium on the surface has helped to form some of the soils. Added material provides new parent material for soil formation. Consequently, soils that developed under these conditions do not have prominent horizons. For example, the Cascilla soils formed in areas characterized by accumulations of loamy deposits of local streams. The Cascilla soils have essentially uniform textures throughout and have a B horizon that is neither prominent nor strongly developed.

Processes resulting in development of soil structure have occurred in most of the soils. Plant roots and other organisms contribute to the rearrangement of soil material into secondary aggregates. The decomposition products of organic residue and the secretions of organisms serve as cementing agents that help stabilize structural aggregates. Alternate wetting and drying, as well as shrinking and swelling, contribute to the development of structural aggregates and are particularly effective in soils that have appreciable amounts of clay. Consequently, soil structure is typically most pronounced in the surface horizon which contains the most organic matter and in clayey horizons that alternately undergo wetting and drying. However, the saturated state of the marsh and swamp soils has buffered the soil structure-forming processes. As a result these soils have massive structure.

Most of the soils in the parish have horizons that have reduced iron and manganese compounds. Reducing conditions prevail for long periods in poorly aerated horizons. Consequently, the relatively soluble reduced forms of iron and manganese predominate over the less soluble oxidized forms. The reduced compounds of these elements result in the gray colors in the Bg horizon and Cg horizon that are characteristic of many of the soils. In the more soluble reduced form, appreciable amounts of iron and manganese can be removed from the soils or translocated within the soil by water.

The presence of iron and manganese concretions and of brown mottles in predominantly gray horizons indicates segregation and local concentration of oxidizing and reducing conditions in the soil. The well drained and somewhat excessively drained soils do not have the gray color associated with wetness and poor aeration. Apparently they are not dominated by a reducing environment for significant periods.

Loss of elements from the soils also has been a process in their formation. Water moving through the soil has leached soluble bases and any free carbonates that may have been present initially from some horizon of most of the soils in the parish. Most of the mineral soils are less acid with depth below horizons at or near the surface. The most extensive leaching typically occurs in loamy, well drained soils, such as the Cahaba soils.

The formation, translocation, and accumulation of clay have also been processes that have helped to develop most of the soils in Jefferson Davis Parish. Silicon and aluminum, released as a result of weathering of such minerals as hornblende, amphiboles, and feldspars, can recombine with the components of water to form secondary clay minerals such as kaolinite. Secondary accumulations of clay result largely from translocation of clays from upper to lower horizons. As water moves downward it can carry small amounts of clay in suspension. This clay is redeposited, and it accumulates at the deepest position of water penetration or in horizons where the clay becomes flocculated or is filtered out by fine pores in the soil. Over long periods, such processes can result in distinct horizons of clay accumulation. All the soils on terraces of Jefferson Davis Parish have a subsoil characterized by a secondary accumulation of clay.

Secondary accumulation of calcium carbonate in the lower soil horizons also is a process that has helped to develop some of the soils in Jefferson Davis Parish. The Basile, Kaplan, Midland, and Morey soils have, in some places, secondary accumulations of carbonates within a depth of 60 inches. Carbonates dissolved from overlying horizons also can be translocated to these depths by water and redeposited. Other sources and processes can contribute to carbonate accumulations, such as segregation of material within the horizon; upward translocation of materials from deeper horizons during fluctuation of water table levels; and material from readily weatherable minerals, such as plagioclase.

Factors of Soil Formation

Soil is a natural, three-dimensional body that formed on the earth's surface. It has properties resulting from the integrated effect of climate and living matter acting on parent material, as conditioned by relief over periods of time.

The interaction of five main factors influences the processes of soil formation and results in differences among the soils. These factors are climate; the physical and chemical composition of the parent material; the kind of plants and other organisms living in and on the soil; the relief of the land and its effect on runoff and soil moisture conditions; and the length of time for the soil to form *(9)*.

The relative effect of any one factor can differ from place to place, but the interaction of all the factors determines the kind of soil that forms. Because of these interactions, many of the differences in soils cannot be attributed to differences in only one factor. For example, organic matter content in the soils of Jefferson Davis Parish is influenced by several factors, including relief, parent material, and living organisms. In the following paragraphs, the factors of soil formation are discussed as they relate to soils in the parish.

Climate

Jefferson Davis Parish is in a region characterized by a humid, subtropical climate. A detailed discussion of the climate in the parish is given in the section "General Nature of the Survey Area."

The climate is relatively uniform throughout the parish. Local differences in the soils are not a result of great differences in climate. The warm average temperatures and the large amounts of precipitation favor a rapid rate of weathering of readily weatherable minerals in the soils. Weathering processes involving the release and reduction of iron and manganese are indicated by the gray colors in the Bg horizon or Cg horizon in many of the soils. Oxidation and segregation of these elements as a result of alternating oxidizing and reducing conditions is indicated by mottled horizons and iron and manganese concretions in most of the soils.

The depth and degree of leaching and weathering of the predominant soils on the parish's two major Pleistocene-age terraces increase from the younger terrace to the older terrace. Thus, the soils on the older terrace were weathered in a climate that had sufficient rainfall to cause considerable leaching and weathering for long periods before the parent materials of the soils on the younger terrace were deposited. The ancient climates, or paleoclimates, could have differed considerably from the present climate. Landscapes of differing ages can have variations between soils because, in part, of climatic variations over thousands of years. In landscapes of comparable ages, differences in weathering, leaching, and translocating clay are caused chiefly by variations in time, relief, and parent material rather than by variations in climate.

Living Organisms

Living organisms affecting the processes of soil formation exert a major influence on the kind and extent of horizon development. Plant growth and animal activity physically modify the soil, thereby affecting porosity, tilth, and content of organic matter. Through photosynthesis, plants use energy from the sun to synthesize compounds necessary for growth. Plant decomposition returns nutrients to the soil and serves as a major source of organic residue. Decomposition and incorporation of organic matter by micro-organisms enhance the tilth and generally increase the infiltration rate and available water capacity in soils.

Relatively stable organic compounds in soils generally have high cation-exchange capacities and thus increase the ability of the soil to absorb and store nutrients such as calcium, magnesium, and potassium. The extent of these and other processes and the kind of organic matter produced can vary widely, depending on the kinds of organisms living in and on the soil. For example, the organic matter content of soils developed under prairie vegetation is typically higher than that of soils developed under forests.

The soils in Jefferson Davis Parish formed under five different major groups of native vegetation. Crowley, Judice, Kaplan, Leton, Midland, Morey, Mowata, Pineisland, and Vidrine soils developed under prairie vegetation, predominantly tall grasses, such as big bluestem. Basile, Cascilla, and Guyton soils developed where the predominant native vegetation was bottom-land hardwoods, such as water oak, sweetgum, and green ash. Allemands and Ged soils formed under aquatic vegetation with successions of fresh and saline environments. Arat and Barbary soils developed under aquatic vegetation, as well as baldcypress and water tupelo. Other soils in the parish, such as Acadia, Bienville, Caddo, Cahaba, Glenmora, Gore, Kinder, and Messer soils, developed in areas of pine or pine-hardwood vegetation.

In Jefferson Davis Parish, the soils formed under prairie vegetation generally have a higher organic matter content than those formed under hardwood vegetation. Soils formed under pine forest vegetation are generally lowest in organic matter content. None of the soils on terraces have large accumulations of organic matter, and most have less than 2 percent in the surface horizon, where quantities of organic matter typically are the greatest. Allemands soils developed under aquatic vegetation in the marshes and have 60 to 70 percent organic matter, by weight, in the surface horizon. The organic matter content of cultivated soils is typically lower than that of similar uncultivated soils, and it can vary widely depending on use and management.

The role of vegetation in the leaching of plant nutrients is apparent in nearly all the soils in the parish. The growing vegetation removes nutrients from the soil horizons and translocates many of them to the parts of the plant above ground. When the plant dies, these nutrients are released on the surface and in surface horizons where they can be absorbed again and used by growing plants. In soils that become highly leached and weathered, this process can considerably influence the quantity and distribution of bases in the soils over long periods of time. For example, base saturation and soil reaction can decrease with depth to less leached and weathered zones. This pattern of distribution of bases is characteristic of essentially all the soils on terraces in Jefferson Davis Parish.

Differences in the amount of organic matter that has accumulated in and on the soils are influenced by the kind and number of micro-organisms present. Aerobic organisms use oxygen from the air to decompose organic matter through rapid oxidation. These organisms are most abundant and prevail for long periods in such better drained and aerated soils as Bienville and Cahaba. Anaerobic organisms are dominant in the more poorly drained soils for long periods during the year. Anaerobic organisms do not required oxygen from the air, and they decompose organic residues very slowly. These different rates of decomposition can result in greater accumulations of organic matter in poorly drained soils than in soils that are better drained.

Relief

Major physiographic features of Jefferson Davis Parish are discussed in the section “Landforms and Surface Geology.” Relief and other physiographic features influence soil formation by affecting soil drainage, runoff, erosion and deposition, and exposure to the sun and wind.

The influence of relief on soils in the parish is especially evident in runoff rate, soil drainage, and depth to and duration of a seasonal high water table. Relief and degree of dissection by streams generally increases along with the geological age of landforms. For example, relief is greater on land surfaces of Intermediate (Montgomery) age than on those of Prairie age. When other factors such as parent material and time are comparable, the steeper soils are better drained, have faster runoff, are more subject to erosion, have a thinner A horizon and B horizon, are less highly leached, and have a seasonal high water table at a greater depth than those soils in areas that are less sloping. This is evident in a comparison of the sloping Glenmora soils with the level Caddo soils.

Parent Material and Time

Parent material is the unconsolidated mass from which soil forms. Its effects are particularly expressed as differences in soil color, texture, permeability, and degree of leaching. Parent material also has a major influence on mineralogy of the soils and is a significant factor in determining their susceptibility to erosion.

Parent material and time are independent factors of soil formation. A particular kind of parent material could have been exposed to processes of soil formation for periods ranging from a few years to more than a million years. The length of time influences the kinds of soil horizons and their degree of development. Long periods of time are generally required for prominent horizons to form. In Jefferson Davis Parish, possible differences in the time of soil formation amount to several thousand years for some of the soils.

The soils in the parish formed in a variety of different parent materials that range in age from the most recent alluvium along streams and in marshes and swamps to the late- to mid-Pleistocene sediments that form the core of the Gulf Coast Prairies and the other terraces. The characteristics, distribution, and depositional pattern of the different parent materials are discussed in detail in the section “Landforms and Surface Geology.”

Landforms and Surface Geology

By B. Arville Touchet, state soil scientist, Natural Resources Conservation Service

Jefferson Davis Parish, in southwestern Louisiana, is in the West Gulf Coastal Plain geomorphic province. The surface sediments dip gently gulfward and are of Holocene (Recent) age to mid-Pleistocene age. These surface sediments are underlain by Tertiary rocks to depths of thousands of feet.

Four general geomorphic surfaces occur in Jefferson Davis Parish. These are the Intermediate Terrace and the Prairie Terrace of Pleistocene age; the flood plains of Holocene (Recent) age, which include hardwood bottom land and swamps; and the Cheniere Plain Marsh of Holocene age. The Intermediate Terrace makes up about 1 percent of the total land area of the parish. The Prairie Terrace is the most extensive terrace and makes up about 93 percent of the total area. Swamps, bottom land, and marshes make up about 4 percent of the parish. The Cheniere Plain Marsh makes up about 2 percent. The Prairie Terrace and the area of Holocene age can be further subdivided into areas distinguished by differences in parent material, physiographic features, or both.

The surface features of the land and the nature and distribution of the materials in which the soils formed are a result of events during and since the mid-Pleistocene Epoch. The major surface features, geologic nature, and relative ages of the three general physiographic areas in the parish are discussed in the following paragraphs.

Pleistocene: Intermediate Terrace

The Intermediate Terrace is within the Western Gulf Coast Flatwoods Major Land Resource Area (MLRA) in the northwestern corner of the parish, west of the Calcasieu River. Maximum surface elevation ranges from near 50 feet above mean sea level in the northwestern corner of the parish to about 25 feet near the Calcasieu River where it underlies the terraces along the river. The area of the Intermediate Terrace corresponds to the Caddo-Glenmora-Messer general soil map unit.

Sediment of the Intermediate Terrace is the oldest soil parent material exposed in Jefferson Davis Parish. The deposits are at least 150,000 years old. The Caddo and Messer soils formed in this parent material and are on nearly level interfluves. The Caddo soils are in intermound areas, and the Messer soils are on mounds or smoothed mound areas. The Glenmora soils are on erosional surfaces between streams and nearly level interfluves.

Pleistocene: Prairie Terrace

The Prairie Terrace in Jefferson Davis Parish is within the Gulf Coast Prairies MLRA. Maximum surface elevation ranges from about 55 feet in the northeastern corner of the parish east of Elton to less than 5 feet in the southwestern corner near Illinois Plantation.

The northwestern part of the Prairie Terrace in the parish corresponds to the Kinder-Leton-Messer general soil map unit. Field investigations conducted during the survey indicate that the Prairie Terrace in this area consists of a thin veneer of sediments over the Intermediate Terrace. This area was originally tall grass prairie. It was later encroached upon by trees and now has small wooded areas scattered throughout. The Kinder and Messer soils are on broad, nearly level interfluves. The Leton soils are on broad flats and in overland outflow channels and depressional areas. The Kinder soils are in intermound areas, and the Messer soils are on mounds and smoothed mound areas.

A high ridge in the north-central part of the parish extends from an area southeast of Elton, through Pine Island to an area east of Woodlawn. This ridge is part of a former high delta distributary system. It corresponds to the Crowley-Vidrine-Pineisland general soil map unit. Field investigations conducted during the survey reveal a strata of red material beneath the grayish surface strata of the Prairie Terrace throughout the parish. In this survey, the red strata is referred to as the Pineisland soil stratigraphic unit. The Pineisland soil stratigraphic unit outcrops along the crest of the northeast to southwest striking ridge in the north-central part of the parish. In all other places, this unit lies immediately beneath the Crowley soil stratigraphic unit. The Crowley and Vidrine soils are in nearly level areas that flank the higher Pineisland soils. The Crowley soils are in intermound areas, and the Vidrine soils are on mounds and leveled mound areas.

A large part of the Prairie Terrace in the parish corresponds to the Crowley-Vidrine-Mowata general soil map unit. In the area of this general soil map unit, the surface features of a former distributary delta system are evident but not as prominent as in the Crowley-Vidrine-Pineisland general soil map unit. The Crowley and Vidrine soils are on level to slightly convex interfluves. The Mowata soils are on broad flats and along drainageways. They receive runoff water from the higher Crowley and Vidrine soils. Typically, areas of the Mowata soils are heads of natural drainage systems.

Another part of the Prairie Terrace in the parish, which is part of the same delta distributary system, has a low elevation and a poorly drained setting. This area corresponds to the Morey-Leton-Mowata general soil map unit. The Morey and Mowata soils are on broad flats and are slightly higher than the Leton soils. The Leton soils are on broad flats, in meandering drainageways, and in small depressional areas that receive runoff from higher soils.

In the geologic past, some areas of the Prairie Terrace which had low elevations and inadequate outlets consisted of intermittent lakes or backswamps. These areas received both water and sediments from the higher parts of the Prairie Terrace. This lacustrine sediment occurs as a veneer of varying thicknesses over the Crowley soil stratigraphic unit. The areas correspond to the Kaplan-Mowata-Leton, Kaplan-Midland, and the Midland-Morey-Judice general soil map units. The Kaplan soils are on broad, slightly convex ridges and on side slopes along abandoned distributary channels. The Midland and Judice soils are on broad flats and in slightly concave or broad depressional areas.

Holocene: Recent Sediments

Headward erosion during the last ice age lowered the base level of the bayous and river valleys in the parish. A subsequent rise in sea level inundated the lower parts of these entrenched valleys, as well as some low areas in the southwestern part of the parish. This inundation interrupted valley filling in these areas. These inundated parts of the Prairie Terrace are now swamps and marshes. They correspond to the Barbary-Arat and Ged-Allemands general soil map units. The Barbary and Arat soils are in the tupelo gum-cypress swamps of Bayou Lacassine, the Mermentau River, and the lower Bayou Nezpique. The Ged and Allemands soils are in marshy areas in the lower part of Bayou Lacassine, along the southern part of Lake Arthur, and in the Bell City drainage canal area. The Barbary, Arat, and Ged soils are fluid mineral soils, and the Allemands soils are fluid organic soils.

Lake Arthur is an example of a former valley that was inundated. It previously received fluvial sediment; but the valley was abandoned as a drainageway when the more modern fluvial deltas shifted to the southeast. Today, this abandoned and inundated valley receives very little fluvial sediment.

The Calcasieu River crosses the northwestern corner of Jefferson Davis Parish. It is in a trench between the Intermediate Terrace and the Prairie Terrace.

Low terraces along the Calcasieu River correspond to the Bienville-Cahaba-Guyton general soil map unit. In places, more recent terrace sediments overlie sediments of the Prairie Terrace. The Bienville and Cahaba soils are on ridges, and the Guyton soils are on broad flats and in swales and other depressional areas.

Bayou Nezpique is entrenched wholly into the Prairie Terrace. It dissects all of the delta distributary system and forms the eastern boundary of the parish. Bayou Nezpique merges with Bayou des Canne to form the Mermentau River. The flood plains of these rivers and bayous correspond to the Basile-Guyton-Cascilla general soil map unit. The Basile and Guyton soils are in low or depressional areas on the flood plain, and the Cascilla soils are on low ridges or natural levees along stream channels.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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 shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas 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 or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

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.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

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.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

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 wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

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.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A, O, or E 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 overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it 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 potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

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 rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 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.

N-value. The relationship between the percentage of water under field conditions and the percentages of inorganic clay and of humus.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Very slow	less than .06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

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.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

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 degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly 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 generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

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.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

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.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

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 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. 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 that provide vegetative barriers to wind erosion 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).

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 E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

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. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

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 generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Water leveling. A method of smoothing or leveling fields that will be planted to rice. The fields are flooded to a shallow depth by irrigation water; then the soil surface is scraped and stirred up to create a soil-water suspension. As the soil particles settle out of the suspension, the land surface is smoothed.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth’s surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Tables

SOIL LEGEND

Soil map symbols and map unit names are alphabetical. Map symbols are letters. The first letter, always a capital, is the initial letter of the soil series name. The second letter is a small letter except in order three map units, in which case it is a capital letter. Order three map units, in addition to having all capital letter symbols, are further indicated by the footnote 1/.

SYMBOL	NAME
AcB	Acadia silt loam, 1 to 3 percent slopes
AEA	Allemands muck 1/
ARA	Arat mucky silt loam 1/
BBA	Barbary mucky clay 1/
BEA	Basile and Cascilla silt loams, frequently flooded 1/
BhB	Bienville loamy fine sand, 1 to 3 percent slopes
BnB	Bienville-Guyton complex, gently undulating
CdA	Caddo-Messer silt loams
ChB	Cahaba fine sandy loam, 1 to 3 percent slopes
CrA	Crowley-Vidrine silt loams, 0 to 1 percent slopes
CrB	Crowley-Vidrine silt loams, 1 to 3 percent slopes
GDA	Ged clay 1/
GnB	Glenmora silt loam, 1 to 3 percent slopes
GrC	Gore silt loam, 1 to 5 percent slopes
GtA	Guyton silt loam, occasionally flooded
GUA	Guyton and Bienville soils, frequently flooded 1/
JdA	Judice silty clay
KpA	Kaplan silt loam, 0 to 1 percent slopes
KpB	Kaplan silt loam, 1 to 3 percent slopes
KrA	Kinder-Messer silt loams
LeA	Leton silt loam
LtA	Leton silt loam, occasionally flooded
MdA	Midland silt loam
MoA	Morey loam
MtA	Mowata silt loam
MwA	Mowata-Vidrine silt loams
PnB	Pineisland loam, 1 to 3 percent slopes
Pt	Pits, sand and gravel
VnB	Vidrine silt loam, 1 to 3 percent slopes

1. Order three map units. Fewer soil examinations were made in these map units, and delineations and included areas are generally larger. These map units were designed primarily for woodland and wildlife habitat management.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER
(sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 66
- Federal — 287
- State — 52
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or Small (Named where applicable) — water

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban area) (occupied)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water
- Intermittent — int

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — AcB BBA

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

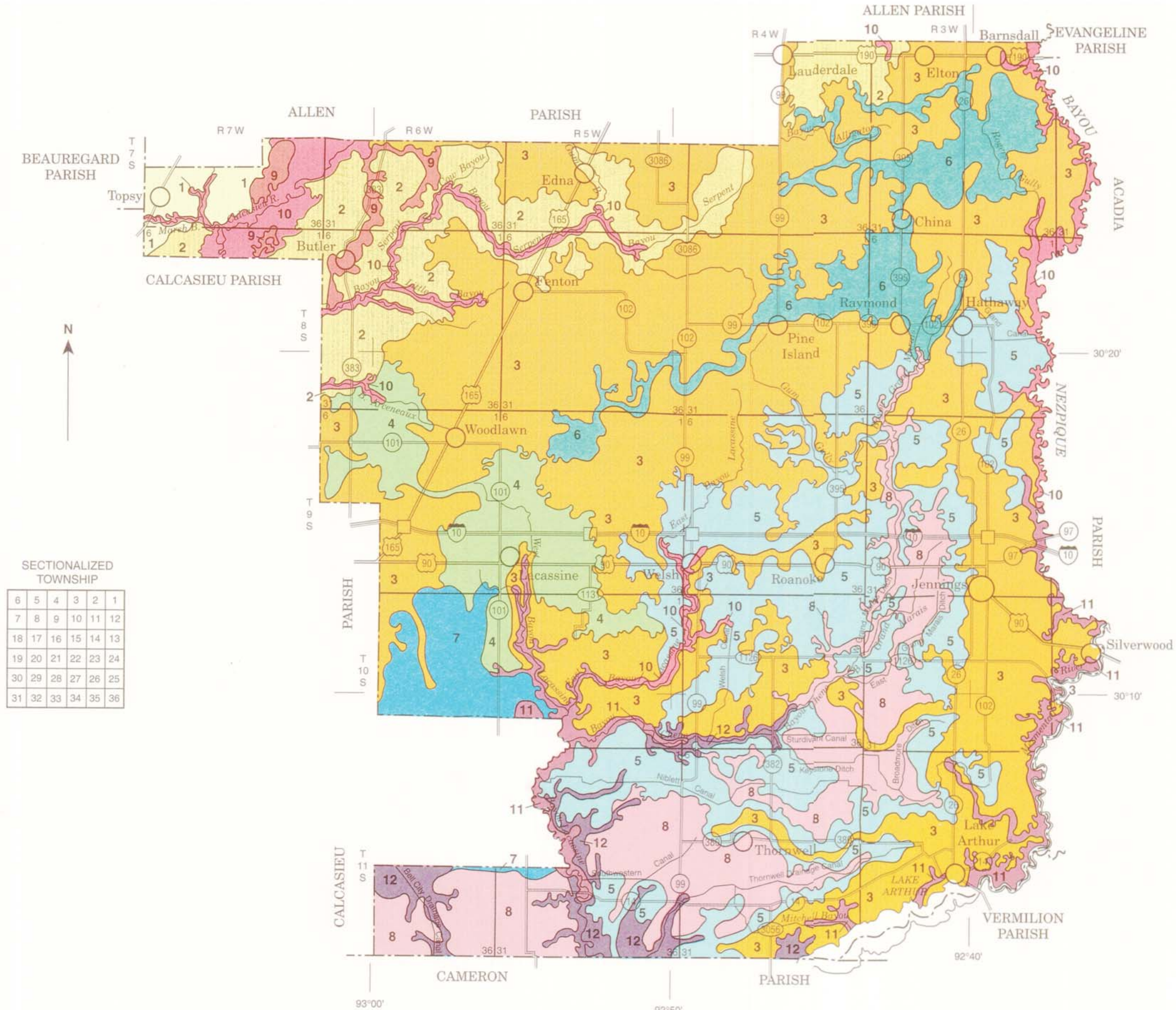
GULLY

DEPRESSION OR SINK

SOIL SAMPLE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot



SOIL LEGEND*

SOILS ON TERRACES

1	Caddo-Glenmora-Messer
2	Kinder-Leton-Messer
3	Crowley-Vidrine-Mowata
4	Kaplan-Mowata-Leton
5	Kaplan-Midland
6	Crowley-Vidrine-Pineisland
7	Morey-Leton-Mowata
8	Midland-Morey-Judice
9	Bienville-Cahaba-Guyton

SOILS ON FLOOD PLAINS

10	Basile-Guyton-Cascilla

SOILS IN SWAMPS AND MARSHES

11	Barbary-Arat
12	Ged-Allemands

* The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 1988

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
LOUISIANA AGRICULTURAL EXPERIMENT STATION
LOUISIANA STATE SOIL AND WATER COMMITTEE

GENERAL SOIL MAP

JEFFERSON DAVIS PARISH, LOUISIANA

Scale 1 : 253,440

Each area outlined on this map consists of more that one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1961-90 at Jennings, Louisiana)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	^oF	^oF	^oF	^oF	^oF	Units	In	In	In		In
January	59.2	39.9	49.6	77	17	129	5.38	2.75	7.68	7	0.1
February	63.4	42.7	53.0	79	24	159	4.19	2.17	5.96	5	0.1
March	71.3	49.8	60.6	85	28	343	4.34	1.86	6.45	5	0.0
April	78.7	57.7	68.2	89	37	545	4.07	1.15	6.42	3	0.0
May	84.6	64.8	74.7	93	50	764	5.57	2.42	8.25	6	0.0
June	89.6	70.8	80.2	97	59	905	4.65	1.85	7.01	5	0.0
July	91.2	72.7	82.0	98	65	989	5.82	3.95	7.52	9	0.0
August	91.4	72.1	81.7	98	62	983	5.11	2.45	7.41	7	0.0
September	87.9	68.2	78.1	96	50	841	5.50	3.13	7.61	6	0.0
October	80.7	57.5	69.1	92	38	592	4.22	1.38	6.81	4	0.0
November	71.0	49.7	60.4	85	29	332	4.65	2.03	6.89	5	0.0
December	62.9	42.8	52.9	80	20	174	5.62	3.50	7.54	6	0.0
Yearly:											
Average	77.7	57.4	67.5	---	---	---	---	---	---	---	---
Extreme	---	---	---	99	16	---	---	---	---	---	---
Total	---	---	---	---	---	6757	59.13	51.85	65.82	68	0.2

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minumum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F)

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1961-90 at Jennings, Louisiana)

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--	February 20	March 6	March 22
2 year in 10 later than--	February 11	February 26	March 14
5 year in 10 later than--	January 23	February 8	February 27
First freezing temperature in fall:			
1 year in 10 earlier than--	December 7	November 21	November 7
2 years in 10 earlier than--	December 19	November 30	November 14
5 years in 10 earlier than--	January 11	December 17	November 29

TABLE 3.--GROWING SEASON

(Recorded for the period 1961-90 at Jennings, Louisiana)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	305	279	245
8 years in 10	320	290	255
5 years in 10	351	311	274
2 years in 10	> 365	333	294
1 year in 10	> 365	344	304

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses	Intensive recreation areas
	Pct					
1. Caddo-Glenmora-Messer	1.0	Moderately well suited: wetness, slope, low fertility, potential aluminum toxicity.	Moderately well suited: (Glenmora soils are well suited.) wetness, slope, low fertility.	Moderately well suited: (Glenmora soils are well suited.) restricted use of equipment, soil compaction, seedling mortality, plant competition.	Poorly suited: (Glenmora and Messer soils are moderately well suited.) Wetness, slow permeability, low to moderate shrink-swell potential, low strength for roads.	Poorly suited: (Messer and Glenmora soils are moderately well suited.) Wetness, slope, slow permeability.
2. Kinder-Leton-Messer	7.0	Moderately well suited: wetness, low fertility, potential aluminum toxicity, flooding.	Moderately well suited: wetness, low fertility, flooding.	Moderately well suited: restricted use of equipment, soil compaction, seedling mortality, plant competition.	Poorly suited: wetness, flooding, slow permeability, low strength for roads.	Poorly suited: wetness, flooding, slow permeability.
3. Crowley-Vidrine-Mowata	49.0	Moderately well suited: wetness, low fertility, potential aluminum toxicity.	Moderately well suited: wetness, medium fertility, slope.	Moderately well suited: restricted use of equipment, soil compaction, seedling mortality, plant competition.	Poorly suited: wetness, high shrink-swell potential, very slow and slow permeability, low strength for roads, flooding.	Poorly suited: wetness, slow and very slow permeability.
4. Kaplan-Mowata-Leton	4.0	Moderately well suited: (Leton soils that are occasionally flooded are poorly suited.) wetness, low or medium fertility, potential aluminum toxicity, slope.	Moderately well suited: wetness, slope, low or medium fertility, flooding.	Moderately well suited: restricted use of equipment, soil compaction, seedling mortality, plant competition.	Poorly suited: wetness, flooding, slow and very slow permeability, moderate and high shrink-swell potential, low strength for roads.	Moderately well suited: (Mowata and Leton soils are poorly suited.) flooding, slope, slow and very slow permeability.

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP--Continued

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses	Intensive recreation areas
	Pct					
5. Kaplan-Midland	18.0	Moderately well suited: wetness, slope, medium fertility.	Well suited: (Midland soils are moderately well suited because of wetness.)	Moderately well suited: restricted use of equipment, soil compaction, seedling mortality, plant competition.	Poorly suited: wetness, flooding, slow and very slow permeability, moderate and high shrink-swell potential, low strength for roads.	Moderately well suited: (Midland soils are poorly suited because of wetness, slow and very slow permeability, slope.)
6. Crowley-Vidrine-Pineisland	4.0	Moderately well suited: wetness, low and medium fertility, slope, potential aluminum toxicity, restricted rooting depth.	Moderately well suited: wetness, low and medium fertility, slope.	Moderately well suited: restricted use of equipment, soil compaction, seedling mortality, plant competition, restricted rooting depth.	Poorly suited: wetness; moderately slow, slow, and very slow permeability; low to high shrink-swell potential; low strength for roads.	Poorly suited: wetness; moderately slow, slow, and very slow permeability.
7. Morey-Leton-Mowata	2.0	Moderately well suited: wetness, low and medium fertility, potential aluminum toxicity, flooding.	Moderately well suited: wetness, low and medium fertility, flooding.	Moderately well suited: restricted use of equipment, soil compaction, seedling mortality, plant competition.	Poorly suited: wetness, flooding, slow and very slow permeability, low to high shrink-swell potential, low strength for roads.	Poorly suited: wetness, slow and very slow permeability, flooding.

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP--Continued

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses	Intensive recreation areas
	Pct					
8. Midland-Morey-Judice	8.0	Moderately well suited: wetness, poor tilth, medium fertility.	Moderately well suited: wetness, medium fertility.	Moderately well suited: restricted use of equipment, soil compaction, seedling mortality, plant competition.	Poorly suited: wetness, flooding, slow and very slow permeability, high shrink-swell potential, flooding, low strength for roads.	Poorly suited: wetness, slow and very slow, permeability, flooding.
9. Bienville-Cahaba-Guyton	1.0	Moderately well suited: low fertility, wetness, droughtiness, potential aluminum toxicity, flooding, slope.	Moderately well suited: low fertility, droughtiness, wetness, flooding.	Moderately well suited: (Cahaba soils are well suited.) restricted use of equipment, soil compaction, seedling mortality, plant competition.	Moderately well suited: (Cahaba soils are well suited and Guyton soils are poorly suited.) wetness, flooding, moderately rapid to slow permeability, droughtiness, low strength for roads, cutbanks cave easily.	Moderately well suited: (Cahaba soils are well suited and Guyton soils are poorly suited.) slope, sandy surface layer, droughtiness, wetness, flooding.
10. Basile-Guyton-Cascilla	2.0	Poorly suited: flooding, wetness.	Poorly suited: wetness.	Moderately well suited: restricted use of equipment, soil compaction, seedling mortality.	Not suited: flooding, wetness.	Not suited: flooding, wetness.

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP--Continued

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses	Intensive recreation areas
	Pct					
11. Barbary-Arat	2.0	Not suited: wetness, ponding, flooding, low strength.	Not suited: wetness, ponding, flooding, low strength.	Poorly suited: low strength, special equipment needed, slow regrowth.	Not suited: flooding, ponding, wetness, low strength.	Not suited: flooding, ponding, wetness, low strength.
12. Ged-Allemands	2.0	Not suited: wetness, ponding, flooding, low strength.	Not suited: wetness, ponding, flooding, low strength.	Not suited: wetness, ponding, flooding, low strength, trees not native.	Not suited: wetness, ponding, flooding, low strength.	Not suited: flooding, wetness, ponding, low strength.

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AcB	Acadia silt loam, 1 to 3 percent slopes	5,800	1.4
AEA	Allemands muck	2,100	0.5
ARA	Arat mucky silt loam	3,600	0.9
BBA	Barbary mucky clay	4,200	1.0
BEA	Basile and Cascilla silt loams, frequently flooded	8,800	2.1
BhB	Bienville loamy fine sand, 1 to 3 percent slopes	700	0.2
BnB	Bienville-Guyton complex, gently undulating	800	0.2
CdA	Caddo-Messer silt loams	2,800	0.7
ChB	Cahaba fine sandy loam, 1 to 3 percent slopes	1,300	0.3
CrA	Crowley-Vidrine silt loams, 0 to 1 percent slopes	151,200	35.9
CrB	Crowley-Vidrine silt loams, 1 to 3 percent slopes	12,200	2.9
GDA	Ged clay	5,300	1.3
GnB	Glenmora silt loam, 1 to 3 percent slopes	1,300	0.3
GrC	Gore silt loam, 1 to 5 percent slopes	3,500	0.8
GtA	Guyton silt loam, occasionally flooded	500	0.1
GUA	Guyton and Bienville soils, frequently flooded	4,300	1.0
JdA	Judice silty clay	11,900	2.8
KpA	Kaplan silt loam, 0 to 1 percent slopes	65,000	15.4
KpB	Kaplan silt loam, 1 to 3 percent slopes	3,100	0.7
KrA	Kinder-Messer silt loams	23,300	5.5
LeA	Leton silt loam	15,000	3.6
LtA	Leton silt loam, occasionally flooded	6,500	1.5
MdA	Midland silt loam	38,900	9.2
MoA	Morey loam	13,500	3.2
MtA	Mowata silt loam	14,700	3.5
MwA	Mowata-Vidrine silt loams	14,600	3.5
PnB	Pineisland loam, 1 to 3 percent slopes	1,400	0.3
Pt	Pits, sand and gravel	1,300	0.3
VnB	Vidrine silt loam, 1 to 3 percent slopes	1,700	0.4
	Water, large areas	2,300	0.5
	Total	421,600	100.0

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Soil name and map symbol	Land capability		Rice		Soybeans		Bahiagrass		Common bermudagrass		Improved bermudagrass	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	AUM*	AUM*	AUM*	AUM*	AUM*	AUM*
AcB: Acadia	IIIe	---	---	100	27	---	6.5	---	5.0	---	9.5	---
AEA: Allemands	VIIIw	---	---	---	---	---	---	---	---	---	---	---
ARA: Arat	VIIIw	---	---	---	---	---	---	---	---	---	---	---
BBA: Barbary	VIIw	---	---	---	---	---	---	---	---	---	---	---
BEA: Basile and Cascilla	Vw	---	---	---	---	---	---	---	5.2	---	---	---
BhB: Bienville	IIs	---	---	---	27	---	6.5	---	7.0	---	11.0	---
BnB: Bienville-Guyton	IIs IIIw	---	---	---	---	---	8.0	---	5.9	---	9.5	---
CdA: Caddo-Messer	IIIw IIIe	---	---	103	25	---	6.3	---	6.0	---	10.0	---
ChB: Cahaba	IIe	---	---	---	30	---	8.0	---	7.0	---	9.5	---
CrA: Crowley-Vidrine	IIIw	---	---	118	30	---	7.3	---	5.5	---	10.0	---
CrB: Crowley-Vidrine	IIIe	---	---	108	27	---	7.5	---	5.5	---	10.5	---
GDA: Ged	VIIw	---	---	---	---	---	---	---	---	---	---	---
GnB: Glenmora	IIe	---	---	110	30	---	7.0	---	5.0	---	11.0	---
GrC: Gore	IVe	---	---	---	23	---	6.5	---	4.5	---	9.0	---
GtA: Guyton	IVw	---	---	---	---	---	6.0	---	4.5	---	---	---
GUA: Guyton and Bienville	Vw	---	---	---	---	---	---	---	4.4	---	---	---
JdA: Judice	IIIw	---	---	120	35	---	---	---	6.5	---	---	---

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability		Rice		Soybeans		Bahiagrass		Common bermudagrass		Improved bermudagrass	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	AUM*	AUM*	AUM*	AUM*	AUM*	AUM*
KpA--------------- Kaplan	IIIw	---	---	125	33	---	6.5	---	6.5	---	10.5	---
KpB--------------- Kaplan	IIIe	---	---	115	30	---	6.5	---	6.5	---	10.0	---
KrA--------------- Kinder-Messer	IIIw IIIe	---	---	---	30	---	6.9	---	6.0	---	9.0	---
LeA--------------- Leton	IIIw	---	---	120	25	---	6.5	---	6.5	---	---	---
LtA--------------- Leton	IVw	---	---	90	25	---	6.0	---	6.5	---	---	---
MdA--------------- Midland	IIIw	---	---	120	30	---	---	---	6.5	---	13.0	---
MoA--------------- Morey	IIIw		---	120	35	---	6.5	---	6.5	---	10.0	---
MtA--------------- Mowata	IIIw	---	---	120	30	---	6.5	---	6.1	---	---	---
MwA--------------- Mowata-Vidrine	IIIw	---	---	113	30	---	6.7	---	6.5	---	10.0	---
PnB--------------- Pineisland	IIe	---	---	95	28	---	7.0	---	6.5	---	10.0	---
Pt** Pits												
VnB--------------- Vidrine	IIe	---	---	90	30	---	7.5	---	5.5	6.5	10.5	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available.)

Soil name and map symbol	Ordi-nation symbol	Management concerns: Equip-ment limita-tion	Seedling mortal-ity	Plant competi-tion	Potential productivity: Common trees	Site index	Produc-tivity class*	Trees to plant
AcB---------------- Acadia	9W	Moderate	Slight	Severe	Loblolly pine-------	86	9	Loblolly pine, slash pine, water oak, cherrybark oak.
					Slash pine----------	86	11	
					Longleaf pine-------	70	6	
					Sweetgum-----------	80	6	
					Water oak----------	80	5	
ARA---------------- Arat	5W	Severe	Severe	Moderate	Water tupelo--------	50	5	Baldcypress.
					Baldcypress---------	50	3	
BBA---------------- Barbary	4W	Severe	Severe	Moderate	Baldcypress---------	80	4	Baldcypress.
					Water tupelo--------	60	6	
					Black willow--------	---	--	
BEA**:								
Basile------------	4W	Severe	Severe	Moderate	Sweetgum------------	65	4	Overcup oak, green ash.
					Baldcypress---------	---	--	
					Overcup oak---------	---	--	
					Nuttall oak---------	---	--	
					American sycamore---	---	--	
Cascilla----------	14W	Moderate	Severe	Moderate	Cherrybark oak------	112	14	Cherrybark oak, loblolly pine, nuttall oak, sweetgum.
					Eastern cottonwood--	110	11	
					Loblolly pine-------	93	10	
					Nuttall oak---------	114	--	
					Water oak----------	104	7	
					Sweetgum-----------	102	10	
					Yellow poplar-------	115	9	
BhB Bienville---------	10S	Severe	Moderate	Slight	Lobolly pine--------	96	10	Lobolly pine, slash pine.
					Longleaf pine-------	88	8	
					Shortleaf pine------	75	8	
BnB**:								
Bienville---------	10S	Severe	Moderate	Slight	Lobolly pine--------	96	10	Lobolly pine, slash pine.
					Longleaf pine-------	88	8	
					Shortleaf pine------	75	8	
Guyton------------	8W	Severe	Moderate	Severe	Loblolly pine-------	85	8	Loblolly pine, slash pine, sweetgum, greem ash, water oak, cherrybark oak.
					Green ash-----------	---	--	
					Sweetgum------------	---	--	
					Black willow--------	---	--	
					Water oak----------	---	--	
					Sugarberry----------	---	--	
					Slash pine----------	90	11	
CdA**:								
Caddo-------------	10W	Severe	Moderate	Severe	Loblolly pine-------	98	10	Loblolly pine, slash pine, water oak, cherrybark oak, green ash.
					Slash pine----------	---	--	
					Sweetgum------------	---	--	
					Water oak----------	---	--	
Messer------------	10W	Moderate	Slight	Moderate	Loblolly pine-------	95	10	Loblolly pine, slash pine, water oak, cherrybark oak, green ash.
					Slash pine----------	95	12	
					Longleaf pine-------	75	6	
					Sweetgum------------	90	7	

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
ChB---------------- Cahaba	9A	Slight	Slight	Moderate	Loblolly pine-------	87	9	Loblolly pine, slash pine, sweetgum, water oak.
					Slash pine----------	91	12	
					Shortleaf pine------	70	8	
					Yellow poplar-------	---	--	
					Sweetgum------------	90	7	
					Southern red oak----	---	--	
					Water oak-----------	---	--	
CrA**, CrB**:								
Crowley-----------	11W	Severe	Moderate	Severe	Slash pine----------	90	11	Slash pine, loblolly pine, water oak, cherrybark oak, green ash.
					Loblolly pine-------	90	9	
Vidrine-----------	9W	Moderate	Slight	Severe	Loblolly pine-------	90	9	Loblolly pine, slash pine, water oak, cherrybark oak, green ash.
					Slash pine----------	90	11	
					Sweetgum------------	---	--	
GnB---------------- Glenmora	10A	Moderate	Slight	Severe	Loblolly pine-------	93	10	Loblolly pine, slash pine, cherrybark oak, water oak.
					Slash pine----------	---	--	
					Longleaf pine-------	---	--	
					Sweetgum------------	---	--	
					Water oak-----------	---	--	
					Cherrybark oak------	---	--	
GrC---------------- Gore	7C	Moderate	Moderate	Moderate	Loblolly pine-------	76	7	Loblolly pine, slash pine.
					Shortleaf pine------	---	--	
GtA---------------- Guyton	8W	Severe	Moderate	Severe	Loblolly pine-------	85	8	Loblolly pine, water oak, green ash, sweetgum.
					Slash pine----------	90	11	
					Sweetgum------------	---	--	
					Green ash-----------	---	--	
					Cherrybark oak------	---	--	
					Water oak-----------	---	--	
					Willow oak----------	78	5	
GUA**:								
Guyton------------	6W	Severe	Severe	Severe	Green ash-----------	100	6	Nuttall oak, green ash.
					Sweetgum------------	---	--	
					Black willow--------	---	--	
					Nuttall oak---------	---	--	
					Eastern cottonwood--	---	--	
					Sugarberry----------	---	--	
					Loblolly pine-------	95	10	
Bienville---------	8W	Moderate	Severe	Slight	Loblolly pine-------	80	8	Water oak, green ash, cherrybark oak.
					Water oak-----------	---	--	
					Sweetgum------------	100	10	
JdA---------------- Judice	7W	Severe	Severe	Severe	Cherrybark oak------	85	7	Water oak, nuttall oak, green ash.
					Water oak-----------	---	--	
					Sweetgum------------	---	--	
					Eastern cottonwood--	100	9	
KpA, KpB----------- Kaplan	6W	Moderate	Slight	Severe	Water oak-----------	90	6	Water oak, green ash, cherrybark oak.
					Sweetgum------------	90	7	
					Green ash-----------	---	--	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
KrA**:								
Kinder	11W	Severe	Slight	Severe	Slash pine	90	11	Slash pine, loblolly pine, water oak, green ash, cherrybark oak.
					Loblolly pine	90	9	
Messer	10W	Moderate	Slight	Moderate	Loblolly pine	95	10	Loblolly pine, slash pine, water oak, cherrybark oak, green ash.
					Slash pine	95	12	
					Longleaf pine	75	6	
					Sweetgum	90	7	
LeA, LtA Leton	9W	Severe	Severe	Severe	Slash pine	75	9	Slash pine, loblolly pine, water oak, willow oak, green ash.
					Loblolly pine	90	9	
MdA Midland	4W	Severe	Moderate	Severe	Green ash	85	4	Loblolly pine, green ash, water oak.
					Water oak	90	6	
					Sweetgum	90	7	
					Cherrybark oak	---	--	
					Honeylocust	---	--	
					Sugarberry	---	--	
MoA Morey	9W	Severe	Severe	Severe	Loblolly pine	90	9	Loblolly pine, slash pine, green ash, water oak.
					Longleaf pine	80	7	
					Southern red oak	80	4	
MtA Mowata	9W	Severe	Moderate	Severe	Loblolly pine	90	9	Loblolly pine, slash pine, green ash, water oak.
					Slash pine	90	11	
					Sweetgum	90	7	
MwA**:								
Mowata	9W	Severe	Moderate	Severe	Loblolly pine	90	9	Loblolly pine, slash pine, green ash, water oak.
					Slash pine	90	11	
					Sweetgum	90	7	
Vidrine	9W	Moderate	Slight	Severe	Loblolly pine	90	9	Loblolly pine, slash pine, water oak, cherrybark oak, green ash.
					Slash pine	90	11	
					Sweetgum	---	--	
PnB Pineisland	8D	Slight	Slight	Severe	Loblolly pine	84	8	Loblolly pine, shumard oak, sweetgum, water oak.
VnB Vidrine	9W	Moderate	Slight	Severe	Loblolly pine	90	9	Loblolly pine, slash pine, water oak, cherrybark oak, green ash.
					Slash pine	90	11	
					Sweetgum	---	--	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AcB Acadia	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
AEA Allemands	Severe: flooding, ponding, percs slowly.	Severe: ponding, excess humus, percs slowly.	Severe: flooding, excess humus, ponding.	Severe: ponding, excess humus.	Severe: flooding, ponding, excess humus.
ARA Arat	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
BBA Barbary	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, flooding, ponding.	Severe: ponding, too clayey.	Severe: ponding, flooding, too clayey.
BEA*:					
Basile	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Cascilla	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
BhB Bienville	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
BnB*:					
Bienville	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness,	Severe: wetness.	Severe: wetness,
CdA*:					
Caddo	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Messer	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
ChB Cahaba	Slight	Slight	Moderate: slope.	Slight	Slight.
CrA*, CrB*:					
Crowley	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CrA*, CrB*:					
Vidrine	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
GDA. Ged	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, flooding.	Severe: ponding, too clayey.	Severe: ponding, flooding, too clayey.
GnB. Glenmora	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
GrC. Gore	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: droughty.
GtA. Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
GUA*:					
Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Bienville	Severe: flooding.	Moderate: flooding, too sandy.	Severe: flooding.	Moderate: too sandy, flooding.	Severe: flooding.
JdA. Judice	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, percs slowly.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
KpA. Kaplan	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
KpB. Kaplan	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
KrA*:					
Kinder	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Messer	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
LeA, LtA. Leton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MdA------------------- Midland	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
MoA------------------- Morey	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
MtA------------------- Mowata	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
MwA*:					
Mowata---------------	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Vidrine--------------	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
PnB------------------- Pineisland	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight----------	Slight.
Pt* Pits					
VnB------------------- Vidrine	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
AcB---------------- Acadia	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
AEA---------------- Allemands	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Very poor.	Very poor.	Very poor.	Good.
ARA---------------- Arat	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Fair	Very poor.	Very poor.	Good.
BBA---------------- Barbary	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Fair	Poor	Very poor.	Very poor.	Fair.
BEA*:											
Basile------------	Poor	Fair	Fair	Fair	Poor	Fair	Good	Good	Fair	Fair	Good.
Cascilla----------	Poor	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
BhB---------------- Bienville	Fair	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
BnB*:											
Bienville---------	Fair	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Guyton------------	Poor	Fair	Fair	Fair	Fair	Poor	Good	Good	Poor	Fair	Good.
CdA*:											
Caddo-------------	Fair	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
Messer------------	Good	Good	Good	Fair	Good	Fair	Poor	Poor	Good	Good	Poor.
ChB---------------- Cahaba	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrA*:											
Crowley-----------	Fair	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Fair	Good.
Vidrine-----------	Fair	Good	Good	Fair	Good	Good	Fair	Fair	Good	Good	Fair.
CrB*:											
Crowley-----------	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Fair	Fair	Fair.
Vidrine-----------	Fair	Good	Good	Fair	Good	Good	Poor	Poor	Good	Good	Poor.
GDA---------------- Ged	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Fair	Very poor.	Very poor.	Good.
GnB---------------- Glenmora	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GrC---------------- Gore	Fair	Fair	Good	Fair	Fair	Good	Poor	Poor	Fair	Fair	Poor.
GtA---------------- Guyton	Fair	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
GUA*:											
Guyton	Poor	Fair	Fair	Fair	Fair	Poor	Good	Good	Poor	Fair	Good.
Bienville	Poor	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
JdA Judice	Fair	Fair	Fair	Good	Fair	Good	Good	Good	Poor	Good	Good.
KpA Kaplan	Fair	Good	Fair	Good	Fair	Good	Good	Good	Fair	Fair	Good.
KpB Kaplan	Fair	Good	Fair	Good	Fair	Good	Fair	Fair	Fair	Fair	Fair.
KrA*:											
Kinder	Fair	Fair	Fair	Good	Good	Good	Good	Good	Fair	Good	Good.
Messer	Good	Good	Good	Fair	Good	Fair	Poor	Poor	Good	Good	Poor.
LeA, LtA Leton	Poor	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Good	Good.
MdA Midland	Poor	Fair	Fair	Fair	---	Fair	Good	Good	Fair	Fair	Good.
MoA Morey	Fair	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
MtA Mowata	Poor	Fair	Good	Fair	Fair	Good	Good	Good	Fair	Fair	Good.
MwA*:											
Mowata	Poor	Fair	Good	Fair	Fair	Good	Good	Good	Fair	Fair	Good.
Vidrine	Fair	Good	Good	Fair	Good	Good	Fair	Fair	Good	Good	Fair.
PnB Pineisland	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Pt* Pits											
VnB Vidrine	Fair	Good	Good	Fair	Good	Good	Fair	Fair	Good	Good	Fair.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AcB Acadia	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
AEA Allemands	Severe: excess humus, ponding.	Severe: flooding, ponding, subsides.	Severe: flooding, ponding, subsides.	Severe: flooding, ponding, subsides.	Severe: flooding, ponding, excess humus.
ARA Arat	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding, excess humus.
BBA Barbary	Severe: excess humus, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding.	Severe: ponding, flooding, too clayey.
BEA*:					
Basile	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Cascilla	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
BhB Bienville	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: droughty.
BnB*:					
Bienville	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: droughty.
Guyton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
CdA*:					
Caddo	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Messer	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
ChB Cahaba	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
CrA*, CrB*:					
Crowley	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Vidrine----------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
GDA--------------- Ged	Severe: ponding.	Severe: flooding, shrink-swell, ponding.	Severe: flooding, shrink-swell, ponding.	Severe: ponding, low strength, shrink-swell.	Severe: ponding, flooding, too clayey.
GnB--------------- Glenmora	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
GrC--------------- Gore	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: droughty.
GtA--------------- Guyton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
GUA*:					
Guyton-----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Bienville--------	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
JdA--------------- Judice	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, too clayey.
KpA, KpB---------- Kaplan	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
KrA*:					
Kinder-----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Messer-----------	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
LeA--------------- Leton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, low strength.	Severe: wetness.
LtA--------------- Leton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, low strength, flooding.	Severe: wetness.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MdA--------------- Midland	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
MoA--------------- Morey	Severe: wetness.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Moderate: wetness.
MtA--------------- Mowata	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
MwA*:					
Mowata-----------	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
Vidrine----------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
PnB--------------- Pineisland	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
Pt* Pits					
VnB--------------- Vidrine	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AcB----------------- Acadia	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
AEA----------------- Allemands	Severe: flooding, ponding, percs slowly.	Severe: flooding, seepage, excess humus.	Severe: flooding, ponding, excess humus.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
ARA----------------- Arat	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding, excess humus.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
BBA----------------- Barbary	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
BEA*:					
Basile-------------	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Cascilla-----------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
BhB----------------- Bienville	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Fair: too sandy.
BnB*:					
Bienville----------	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Fair: too sandy.
Guyton-------------	Severe: wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
CdA*:					
Caddo--------------	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Messer-------------	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
ChB----------------- Cahaba	Slight-----------	Severe: seepage.	Severe: seepage.	Slight-----------	Fair: thin layer.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CrA*:					
Crowley	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Vidrine	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
CrB*:					
Crowley	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Vidrine	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
GDA Ged	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: ponding, too clayey, hard to pack.
GnB Glenmora	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness, thin layer.
GrC Gore	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
GtA Guyton	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
GUA*:					
Guyton	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Bienville	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Fair: too sandy.
JdA Judice	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
KpA Kaplan	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
KpB: Kaplan	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
KrA*:					
Kinder	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Messer	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
LeA: Leton	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
LtA: Leton	Severe: wetness, flooding, percs slowly.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Poor: wetness.
MdA: Midland	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
MoA: Morey	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
MtA: Mowata	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
MwA*:					
Mowata	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Vidrine	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
PnB: Pineisland	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
Pt* Pits					
VnB: Vidrine	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AcB: Acadia	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
AEA: Allemands	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
ARA: Arat	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BBA: Barbary	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
BEA*:				
Basile	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Cascilla	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
BhB: Bienville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
BnB*:				
Bienville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
CdA*:				
Caddo	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Messer	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
ChB: Cahaba	Good	Probable	Improbable: too sandy.	Fair: too clayey.
CrA*, CrB*:				
Crowley	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Vidrine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
GDA: Ged	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
GnB: Glenmora	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
GrC: Gore	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
GtA: Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
GUA*:				
Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Bienville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
JdA: Judice	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
KpA, KpB: Kaplan	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
KrA*:				
Kinder	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Messer	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
LeA, LtA: Leton	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MdA: Midland	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
MoA: Morey	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
MtA: Mowata	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
MwA*:				
Mowata	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
MwA*:				
Vidrine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
PnB Pineisland	Fair: low strength, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Pt* Pits				
VnB Vidrine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

TABLE 13.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
AcB: Acadia	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
AEA: Allemands	Severe: excess humus, ponding.	Slight	Flooding, percs slowly, ponding.	Flooding, ponding, percs slowly.	Ponding	Wetness, percs slowly.
ARA: Arat	Severe: ponding, piping.	Severe: slow refill.	Ponding, flooding, percs slowly.	Ponding, flooding, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
BBA: Barbary	Severe: excess humus, hard to pack, ponding.	Severe: slow refill.	Ponding, percs slowly, flooding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
BEA*:						
Basile	Severe: wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Cascilla	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
BhB: Bienville	Severe: piping, seepage.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Soil blowing	Droughty.
BnB*:						
Bienville	Severe: piping, seepage.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Soil blowing	Droughty.
Guyton	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
CdA*:						
Caddo	Severe: wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Messer	Moderate: piping, wetness.	Severe: no water.	Percs slowly	Wetness, soil blowing.	Erodes easily, wetness, soil blowing.	Erodes easily, percs slowly.
ChB: Cahaba	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Favorable	Favorable	Favorable.
CrA*:						
Crowley	Severe: wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
CrA*:						
Vidrine----------	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
CrB*:						
Crowley----------	Severe: wetness.	Severe: no water.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Vidrine----------	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
GDA--------------- Ged	Severe: ponding, hard to pack.	Severe: slow refill.	Percs slowly, flooding, ponding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
GnB--------------- Glenmora	Moderate: piping, wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
GrC--------------- Gore	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Percs slowly, droughty, slope.	Erodes easily, percs slowly.	Erodes easily, droughty.
GtA--------------- Guyton	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
GUA*:						
Guyton-----------	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Bienville--------	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Soil blowing---	Droughty.
JdA--------------- Judice	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly---	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
KpA, KpB---------- Kaplan	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
KrA*:						
Kinder-----------	Severe: wetness.	Severe: no water.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Messer-----------	Moderate: piping, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, soil blowing.	Erodes easily, wetness, soil blowing.	Erodes easily, percs slowly.
LeA--------------- Leton	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
LtA: Leton	Severe: wetness.	Severe: slow refill.	Flooding, percs slowly.	Wetness, percs slowly, flooding.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
MdA: Midland	Severe: wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
MoA: Morey	Severe: wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
MtA: Mowata	Severe: wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
MwA*:						
Mowata	Severe: wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Vidrine	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
PnB: Pineisland	Severe: piping.	Severe: no water.	Percs slowly	Wetness, rooting depth, percs slowly.	Erodes easily, rooting depth, wetness.	Erodes easily, rooting depth, percs slowly.
Pt*: Pits						
VnB: Vidrine	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated.)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In								Pct	
AcB-------------- Acadia	0-6	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	85-100	15-30	NP-7
	6-14	Silt loam, silty clay loam.	CL	A-6	100	100	95-100	85-100	30-40	11-18
	14-41	Clay, silty clay	CH, CL	A-7-6	100	100	95-100	90-100	42-70	20-43
	41-80	Silty clay loam-- silt loam	CH, CL	A-6	100	100	95-100	85-100	30-40	11-18
AEA-------------- Allemands	0-12	Muck-------------	PT	A-8	---	---	---	---	---	---
	12-50	Muck-------------	PT	A-8	---	---	---	---	---	---
	50-60	Clay, mucky clay	MH, OH	A-7-5	100	100	95-100	80-100	65-90	30-50
	60-80	Clay, silty clay, mucky clay.	CH, MH	A-7-5	100	100	95-100	80-100	60-90	30-50
ARA-------------- Arat	0-6	Mucky silt loam	OL, CL-ML, CL	A-4, A-6	100	100	90-100	70-95	18-40	NP-22
	6-60	Silty clay loam, silt loam, mucky silty clay loam.	CL, CL-ML	A-6, A-4, A-7-6	100	100	90-100	80-95	22-45	6-25
BBA-------------- Barbary	0-10	Mucky clay-------	OH, MH	A-7-5, A-8	100	100	100	95-100	70-90	35-45
	10-60	Mucky clay, clay	OH, MH	A-7-5, A-8	100	100	100	95-100	70-90	35-45
BEA*:										
Basile----------	0-24	Silt loam--------	ML, CL, CL-ML	A-4	100	100	90-100	75-95	<30	NP-10
	24-60	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	95-100	80-95	30-42	12-20
	60-96	Silt loam, silty clay loam.	CL	A-6, A-4, A-7-6	100	100	95-100	80-95	28-42	8-20
Cascilla--------	0-7	Silt loam--------	ML, CL-ML, CL	A-4, A-6	100	100	95-100	75-95	20-38	3-15
	7-80	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	100	100	95-100	75-100	20-39	5-15
BhB-------------- Bienville	0-35	Loamy fine sand	SM	A-2-4, A-4	100	100	90-100	15-50	<25	NP-3
	35-68	Loamy fine sand, fine sandy loam, fine sand.	SM, ML	A-2-4, A-4	100	100	90-100	20-55	<25	NP-3
BnB*:										
Bienville-------	0-29	Loamy fine sand	SM	A-2-4, A-4	100	100	90-100	15-50	<25	NP-3
	29-62	Loamy fine sand, fine sandy loam, fine sand.	SM, ML	A-2-4, A-4	100	100	90-100	20-55	<25	NP-3

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In								Pct	
BnB*:										
Guyton	0-16	Silt loam	ML, CL-ML	A-4	100	100	95-100	65-90	<27	NP-7
	16-30	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	100	100	94-100	75-95	22-40	6-18
	30-60	Silt loam, silty clay loam, sandy clay loam.	CL, CL-ML, ML	A-6, A-4	100	100	95-100	50-95	<40	NP-18
CdA*:										
Caddo	0-21	Silt loam	ML, CL-ML	A-4	100	100	95-100	70-95	<27	NP-7
	21-68	Silt loam, loam, silty clay loam.	CL	A-6	100	100	85-100	50-90	30-40	11-18
Messer	0-8	Silt loam	ML, CL-ML	A-4	100	100	95-100	80-95	<27	NP-7
	8-34	Silt loam, loam, very fine sandy loam.	CL, CL-ML	A-6, A-4	100	100	95-100	80-95	25-33	5-12
	34-58	Silty clay loam, clay loam, loam.	CL	A-6, A-7-6	100	100	95-100	80-95	32-45	11-21
	58-72	Silty clay loam, clay loam, loam.	CL	A-6, A-7-6	100	100	95-100	80-95	32-45	11-21
ChB Cahaba	0-25	Fine sandy loam	SM	A-4, A-2-4	95-100	95-100	65-90	30-45	---	NP
	25-60	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6	90-100	80-100	75-90	40-75	22-35	8-15
	60-81	Sand, loamy sand, sandy loam.	SM, SP-SM	A-2-4	95-100	90-100	60-85	10-35	---	NP
CrA*:										
Crowley	0-17	Silt loam	ML, CL-ML, CL	A-4	100	100	95-100	80-100	<30	NP-10
	17-31	Silty clay, silty clay loam, clay loam.	CH, CL	A-7-6	100	100	95-100	85-100	41-60	20-35
	31-73	Silty clay loam, silty clay, clay loam.	CL, CH	A-7-6, A-6	100	100	95-100	85-100	38-60	18-35
Vidrine	0-14	Silt loam	ML, CL-ML	A-4	100	100	100	90-100	<27	NP-7
	14-46	Silty clay, silty clay loam.	CH, CL	A-7-6	100	100	100	90-100	41-60	19-32
	46-65	Silty clay loam, silty clay.	CL, CH	A-7-6, A-6	90-100	85-100	85-100	75-100	33-55	12-28
	65-70	Silt loam, silty clay loam, silty clay.	CL, CH	A-4, A-6, A-7-6	90-100	85-100	85-100	70-100	28-55	8-28
CrB*:										
Crowley	0-19	Silt loam	ML, CL-ML, CL	A-4	100	100	95-100	80-100	<30	NP-10
	19-31	Silty clay, silty clay loam, clay loam.	CH, CL	A-7-6	100	100	95-100	85-100	41-60	20-35
	31-62	Silty clay loam, silty clay, clay loam.	CL, CH	A-7-6, A-6	100	100	95-100	85-100	38-60	18-35

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In								Pct	
CrB*:										
Vidrine	0-18	Silt loam	ML, CL-ML	A-4	100	100	100	90-100	<27	NP-7
	18-42	Silty clay, silty clay loam.	CH, CL	A-7-6	100	100	100	90-100	41-60	19-32
	42-64	Silty clay loam, silty clay.	CL, CH	A-7-6, A-6	90-100	85-100	85-100	75-100	33-55	12-28
GDA Ged	0-8	Clay	CH	A-7-5, A-7-6	100	100	100	80-95	50-75	23-43
	8-16	Clay, mucky clay, silty clay.	CH	A-7-5, A-7-6	100	100	98-100	80-95	53-85	30-52
	16-62	Clay, silty clay	CH	A-7-5, A-7-6	100	100	98-100	85-95	55-85	30-52
GnB Glenmora	0-10	Silt loam	ML, CL-ML	A-4	100	100	90-100	75-85	<27	NP-7
	10-23	Silty clay loam, silt loam.	CL	A-6, A-4	100	100	95-100	80-95	25-38	8-16
	23-54	Silty clay loam	CL	A-6	100	100	95-100	80-95	30-40	12-18
	54-72	Silty clay loam.	CL	A-6	100	100	95-100	80-95	30-40	12-18
GrC Gore	0-4	Silt loam	ML, CL-ML	A-4	100	100	95-100	60-90	<27	NP-7
	4-32	Clay, silty clay	CH	A-7-6	100	100	95-100	85-100	53-65	28-40
	32-74	Loam, silt loam, silty clay loam.	CL	A-6, A-4	100	100	95-100	80-95	25-38	8-16
GtA Guyton	0-29	Silt loam	ML, CL-ML	A-4	100	100	95-100	65-90	<27	NP-7
	29-50	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	100	100	94-100	75-95	22-40	6-18
	50-90	Silt loam, silty clay loam, sandy clay loam.	CL, CL-ML, ML	A-6, A-4	100	100	95-100	50-95	<40	NP-18
GUA*:										
Guyton	0-20	Silt loam	ML, CL-ML	A-4	100	100	95-100	65-90	<27	NP-7
	20-51	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	100	100	94-100	75-95	22-40	6-18
	51-60	Silt loam, silty clay loam, sandy clay loam.	CL, CL-ML, ML	A-6, A-4	100	100	95-100	50-95	<40	NP-18
Bienville	0-40	Loamy fine sand	SM	A-2-4, A-4	100	100	90-100	15-50	<25	NP-3
	40-60	Loamy fine sand, fine sandy loam, fine sand.	SM, ML	A-2-4, A-4	100	100	90-100	30-55	<25	NP-3
JdA Judice	0-9	Silty clay	CL, CH	A-7-6	100	100	100	95-100	47-58	22-30
	9-70	Silty clay, silty clay loam, clay loam.	CH, CL	A-7-6, A-7-5	95-100	95-100	90-100	75-100	47-80	32-48
KpA Kaplan	0-14	Silt loam	ML, CL-ML, CL	A-4	100	100	95-100	80-100	<30	NP-10
	14-20	Silty clay loam, silty clay.	CL, CH	A-6, A-7-6	90-100	90-100	85-100	85-100	30-55	20-35
	20-90	Silty clay loam, silty clay.	CL, CH	A-6, A-7-6	85-100	85-100	80-95	80-95	38-55	20-35

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In								Pct	
KpB-------------- Kaplan	0-9	Silt loam--------	ML, CL-ML, CL	A-4	100	100	95-100	80-100	<30	NP-10
	9-17	Silty clay loam	CL	A-6, A-7-6	90-100	90-100	85-100	85-100	30-49	18-33
	17-80	Silty clay loam, silty clay.	CL, CH	A-6, A-7-6	85-100	85-100	80-95	80-95	38-55	20-35
KrA*:										
Kinder----------	0-19	Silt loam--------	ML, CL-ML, CL	A-4	100	100	95-100	60-100	<28	NP-8
	19-50	Silty clay loam, loam, silt loam.	CL	A-6, A-7-6	100	100	95-100	70-100	32-43	11-20
	50-88	Silt loam, loam, silty clay loam.	CL-ML, CL	A-6, A-4	100	100	95-100	70-100	25-38	5-16
Messer----------	0-8	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	80-95	<27	NP-7
	8-34	Silt loam, loam, very fine sandy loam.	CL, CL-ML	A-6, A-4	100	100	95-100	80-95	25-33	5-12
	34-58	Silty clay loam, clay loam, loam.	CL	A-6, A-7-6	100	100	95-100	80-95	32-45	11-21
	58-72	Silty clay loam, clay loam, loam.	CL	A-6, A-7-6	100	100	95-100	80-95	32-45	11-21
LeA-------------- Leton	0-28	Silt loam--------	CL, CL-ML, SC-SM, SC	A-4, A-6	100	98-100	95-100	45-98	21-30	5-12
	28-86	Clay loam, silty clay loam, loam.	CL	A-6, A-7-6	100	98-100	95-100	51-98	30-43	14-26
LtA-------------- Leton	0-29	Silt loam--------	CL, CL-ML, SC-SM, SC	A-4, A-6	100	98-100	95-100	45-98	21-30	5-12
	29-62	Clay loam, silty clay loam, sandy clay loam.	CL	A-6, A-7-6	100	98-100	95-100	51-98	30-43	14-26
MdA-------------- Midland	0-6	Silt loam--------	CL-ML, CL	A-4, A-6	100	100	95-100	90-100	15-30	4-16
	6-75	Silty clay, clay, silty clay loam.	CH, CL	A-7-6	100	100	100	95-100	41-65	20-40
MoA-------------- Morey	0-19	Loam-------------	CL, CL-ML	A-4, A-6	100	95-100	90-100	75-95	23-40	5-18
	19-36	Silty clay loam, clay loam.	CL	A-6, A-7	100	95-100	90-100	85-95	34-50	14-30
	36-80	Silty clay loam, silty clay, clay loam.	CL, CH	A-6, A-7	98-100	95-100	90-100	85-95	35-60	15-36
MtA-------------- Mowata	0-25	Silt loam--------	CL-ML, CL	A-4	100	100	95-100	90-100	22-30	5-10
	25-42	Silty clay loam, silty clay, clay loam.	CL, CH	A-7-6	100	100	95-100	75-95	41-60	22-37
	42-62	Silty clay loam, silty clay, clay loam.	CL	A-7-6, A-6	100	100	95-100	75-95	37-49	18-29

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In								Pct	
MwA*:										
Mowata----------	0-18	Silt loam--------	CL-ML, CL	A-4	100	100	95-100	90-100	22-30	5-10
	18-50	Silty clay loam, silty clay, clay loam.	CL, CH	A-7-6	100	100	95-100	75-95	41-60	22-37
	50-62	Silty clay loam, silty clay, clay loam.	CL	A-7-6, A-6	100	100	95-100	75-95	37-49	18-29
Vidrine---------	0-20	Silt loam--------	ML, CL-ML	A-4	100	100	100	90-100	<27	NP-7
	20-44	Silty clay, silty clay loam.	CH, CL	A-7-6	100	100	100	90-100	41-60	19-32
	44-62	Silty clay loam, silty clay.	CL, CH	A-7-6, A-6	90-100	85-100	85-100	75-100	33-55	12-28
PnB-------------- Pineisland	0-9	Loam-------------	CL-ML, ML, CL	A-4	100	100	95-100	60-90	21-30	2-10
	9-38	Loam, silt loam, clay loam.	CL-ML, CL	A-4, A-6	100	100	95-100	60-95	21-40	4-20
	38-78	Sandy clay loam, clay loam, loam.	CL-ML, CL	A-4, A-6, A-7-6	100	100	95-100	65-100	21-45	5-28
Pt* Pits										
VnB-------------- Vidrine	0-22	Silt loam--------	ML, CL-ML	A-4	100	100	100	90-100	<27	NP-7
	22-38	Silty clay, silty clay loam.	CH, CL	A-7-6	100	100	100	90-100	41-60	19-32
	38-60	Silty clay loam, silty clay.	CL, CH	A-7-6, A-6	90-100	85-100	85-100	75-100	33-55	12-28

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated.)

Soil name and map symbol	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/cc	In/hr	In/in	pH				Pct
AcB-------------- Acadia	0-6	14-27	1.35-1.70	0.6-2.0	0.16-0.23	4.5-6.0	Low----------	0.49	5	.5-2
	6-14	20-39	1.35-1.70	0.6-2.0	0.16-0.22	4.5-5.5	Moderate-----	0.32		
	14-41	40-55	1.20-1.60	<0.06	0.15-0.18	4.5-6.0	High---------	0.32		
	41-80	30-55	1.20-1.70	<0.2	0.15-0.20	4.5-6.0	High---------	0.32		
AEA-------------- Allemands	0-12	---	0.05-0.25	>2.0	0.20-0.50	5.1-6.5	Low----------	----	---	---
	12-50	---	0.05-0.25	>2.0	0.20-0.50	5.6-7.8	Low----------	----		
	50-60	60-95	0.15-1.00	<0.06	0.14-0.18	6.1-8.4	Low----------	0.32		
	60-80	60-95	0.25-1.00	<0.6	0.12-0.18	6.1-8.4	Low----------	0.37		
ARA-------------- Arat	0-6	5-25	0.25-1.00	0.6-2.0	0.20-0.30	5.1-6.5	Low----------	0.32	5	15-30
	6-60	14-35	0.25-1.00	0.06-0.2	0.18-0.20	5.6-7.8	Low----------	0.37		
BBA-------------- Barbary	0-10	60-95	0.25-1.00	<0.06	0.18-0.20	6.6-7.8	Low----------	0.32	5	4-25
	10-60	60-95	0.25-1.00	<0.06	0.18-0.20	6.6-8.4	Low----------	0.32		
BEA*:										
Basile----------	0-24	10-27	1.35-1.65	0.6-2.0	0.18-0.20	4.5-7.3	Low----------	0.43	5	.5-2
	24-60	20-35	1.35-1.65	0.06-0.2	0.20-0.22	5.6-8.4	Moderate-----	0.37		
	60-96	14-35	1.35-1.70	0.06-0.2	0.18-0.20	6.1-8.4	Low----------	0.43		
Cascilla--------	0-7	5-20	1.40-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.43	5	.5-2
	7-80	18-30	1.45-1.50	0.6-2.0	0.16-0.20	4.5-8.4	Low----------	0.43		
BhB-------------- Bienville	0-35	5-15	1.35-1.60	2.0-6.0	0.08-0.11	4.5-6.5	Low----------	0.20	5	.5-2
	35-68	5-20	1.35-1.70	2.0-6.0	0.08-0.13	4.5-6.0	Low----------	0.20		
BnB*:										
Bienville-------	0-29	5-15	1.35-1.60	2.0-6.0	0.08-0.11	4.5-6.5	Low----------	0.20	5	.5-2
	29-62	5-20	1.35-1.70	2.0-6.0	0.08-0.13	4.5-6.0	Low----------	0.20		
Guyton----------	0-16	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low----------	0.43	5	.5-4
	16-30	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low----------	0.37		
	30-60	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.5	Low----------	0.37		
CdA*:										
Caddo-----------	0-21	14-27	1.35-1.70	0.6-2.0	0.18-0.23	4.5-6.0	Low----------	0.49	5	.5-2
	21-68	18-35	1.35-1.70	0.06-0.2	0.20-0.22	4.5-6.0	Low----------	0.37		
Messer----------	0-8	10-15	1.35-1.65	0.6-2.0	0.15-0.21	3.6-6.0	Low----------	0.49	5	.5-2
	8-34	10-18	1.35-1.70	0.2-0.6	0.20-0.22	4.5-6.0	Low----------	0.43		
	34-58	20-30	1.35-1.70	0.06-0.2	0.15-0.20	3.6-6.0	Low----------	0.37		
	58-72	20-30	1.35-1.70	0.06-0.2	0.15-0.20	3.6-6.0	Low----------	0.37		
ChB-------------- Cahaba	0-25	7-17	1.35-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low----------	0.24	5	.5-2
	25-60	18-35	1.35-1.60	0.6-2.0	0.12-0.20	3.6-6.0	Low----------	0.28		
	60-81	4-20	1.40-1.70	2.0-20	0.05-0.10	3.6-6.0	Low----------	0.24		
CrA*:										
Crowley---------	0-17	10-27	1.30-1.65	0.2-0.6	0.20-0.23	4.5-6.0	Low----------	0.49	5	.5-4
	17-31	35-50	1.20-1.55	<0.06	0.19-0.21	4.5-6.5	High---------	0.32		
	31-73	27-55	1.30-1.65	0.06-0.2	0.20-0.22	4.5-6.5	Moderate-----	0.32		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH				Pct
CrA*:										
Vidrine---------	0-14	10-27	1.30-1.65	0.6-2.0	0.20-0.23	4.5-6.0	Low----------	0.49	5	.5-4
	14-46	27-50	1.20-1.70	0.06-0.2	0.18-0.20	4.5-8.4	High---------	0.32		
	46-65	27-50	1.20-1.65	0.06-0.2	0.18-0.20	5.1-8.4	High---------	0.32		
	65-70	20-50	1.20-1.70	0.06-0.2	0.18-0.22	5.1-8.4	Moderate-----	0.32		
CrB*:										
Crowley---------	0-19	10-27	1.30-1.65	0.2-0.6	0.20-0.23	4.5-8.4	Low----------	0.49	5	.5-4
	19-31	35-50	1.20-1.55	<0.06	0.19-0.21	4.5-8.4	High---------	0.32		
	31-62	27-55	1.30-1.65	0.06-0.2	0.20-0.22	4.5-8.4	Moderate-----	0.32		
Vidrine---------	0-18	10-27	1.30-1.65	0.6-2.0	0.20-0.23	4.5-6.0	Low----------	0.49	5	.5-4
	18-42	27-50	1.20-1.70	0.06-0.2	0.18-0.20	4.5-8.4	High---------	0.32		
	42-64	27-50	1.20-1.65	0.06-0.2	0.18-0.20	5.1-8.4	High---------	0.32		
GDA-------------- Ged	0-8	35-55	0.60-1.35	<0.06	0.14-0.18	4.5-7.8	Low----------	0.28	5	8-20
	8-16	45-75	1.15-1.35	<0.06	0.14-0.18	4.5-7.8	High---------	0.24		
	16-62	60-80	1.20-1.40	<0.06	0.14-0.18	6.1-8.4	High---------	0.24		
GnB-------------- Glenmora	0-10	8-22	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low----------	0.49	5	.5-2
	10-23	18-35	1.35-1.65	0.6-2.0	0.18-0.20	3.6-6.0	Low----------	0.43		
	23-54	27-35	1.35-1.70	0.06-0.2	0.18-0.20	3.6-6.0	Moderate-----	0.43		
	54-72	27-35	1.35-1.60	0.06-0.2	0.18-0.20	3.6-6.0	Moderate-----	0.37		
GrC-------------- Gore	0-4	5-15	1.35-1.60	0.6-2.0	0.18-0.22	4.5-6.0	Low----------	0.49	5	.5-4
	4-32	40-60	1.20-1.65	<0.06	0.08-0.14	4.5-9.0	High---------	0.32		
	32-74	18-35	1.30-1.60	0.06-0.2	0.14-0.20	7.4-9.4	Moderate-----	0.32		
GtA-------------- Guyton	0-29	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low----------	0.43	5	.5-4
	29-50	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low----------	0.37		
	50-90	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.5	Low----------	0.37		
GUA*:										
Guyton----------	0-20	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low----------	0.43	5	.5-4
	20-51	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low----------	0.37		
	51-60	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-8.4	Low----------	0.37		
Bienville-------	0-40	5-15	1.35-1.60	2.0-6.0	0.08-0.11	4.5-6.5	Low----------	0.20	5	.5-2
	40-60	5-20	1.35-1.80	2.0-6.0	0.08-0.13	4.5-6.0	Low----------	0.20		
JdA-------------- Judice	0-9	27-50	1.20-1.70	0.06-0.2	0.17-0.22	5.6-7.3	High---------	0.32	5	2-4
	9-70	27-50	1.20-1.70	<0.06	0.15-0.19	5.6-8.4	High---------	0.32		
KpA-------------- Kaplan	0-14	14-26	1.30-1.60	0.2-0.6	0.18-0.24	5.1-8.4	Low----------	0.43	5	.5-4
	14-20	27-50	1.30-1.60	0.06-0.2	0.18-0.24	6.6-8.4	Moderate-----	0.37		
	20-79	33-50	1.20-1.60	0.06-0.2	0.14-0.22	7.4-8.4	High---------	0.37		
KpB-------------- Kaplan	0-9	14-26	1.30-1.60	0.2-0.6	0.18-0.24	5.1-8.4	Low----------	0.43	5	.5-4
	9-17	27-50	1.30-1.60	0.06-0.2	0.18-0.24	6.6-8.4	Moderate-----	0.37		
	17-80	33-50	1.20-1.60	0.06-0.2	0.14-0.22	7.4-8.4	High---------	0.37		
KrA*:										
Kinder----------	0-19	7-14	1.35-1.65	0.6-2.0	0.15-0.21	3.6-6.0	Low----------	0.43	5	.5-4
	19-50	25-34	1.35-1.70	0.06-0.2	0.15-0.20	4.5-6.5	Moderate-----	0.37		
	50-88	15-32	1.35-1.65	0.2-0.6	0.15-0.20	4.5-8.4	Low----------	0.37		
Messer----------	0-8	10-15	1.35-1.65	0.6-2.0	0.15-0.21	3.6-6.0	Low----------	0.49	5	.5-2
	8-34	10-18	1.35-1.70	0.2-0.6	0.20-0.22	4.5-6.0	Low----------	0.43		
	34-58	20-30	1.35-1.70	0.06-0.2	0.15-0.20	3.6-6.0	Low----------	0.37		
	58-72	20-30	1.35-1.70	0.06-0.2	0.15-0.20	3.6-6.0	Low----------	0.37		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH				Pct
LeA: Leton	0-28	10-25	1.20-1.50	0.6-2.0	0.15-0.20	4.5-7.3	Low	0.43	5	.5-3
	28-86	20-35	1.30-1.60	0.06-0.2	0.15-0.20	5.6-8.4	Moderate	0.37		
LtA: Leton	0-29	10-25	1.20-1.50	0.6-2.0	0.15-0.20	4.5-7.3	Low	0.43	5	.5-3
	29-62	20-35	1.30-1.60	0.06-0.2	0.15-0.20	5.6-8.4	Moderate	0.37		
MdA: Midland	0-6	14-26	1.30-1.65	0.6-2.0	0.18-0.22	5.1-7.3	Low	0.49	5	.5-4
	6-75	35-55	1.19-1.60	<0.06	0.16-0.22	5.1-8.4	High	0.32		
MoA: Morey	0-19	10-30	1.25-1.50	0.6-2.0	0.16-0.24	5.1-7.3	Low	0.37	5	.5-4
	19-36	27-35	1.25-1.50	0.06-0.2	0.18-0.22	5.6-7.8	Moderate	0.37		
	36-80	30-45	1.40-1.65	0.06-0.2	0.18-0.22	5.6-8.4	High	0.37		
MtA: Mowata	0-25	8-24	1.35-1.65	0.2-0.6	0.21-0.23	4.5-7.3	Low	0.49	5	.5-4
	25-42	35-50	1.20-1.60	<0.06	0.18-0.20	4.5-8.4	High	0.37		
	42-62	30-50	1.20-1.65	<0.06	0.18-0.20	4.5-8.4	High	0.43		
MwA*:										
Mowata	0-18	8-24	1.35-1.65	0.2-0.6	0.21-0.23	4.5-7.3	Low	0.49	5	.5-4
	18-50	35-50	1.20-1.60	<0.06	0.18-0.20	4.5-8.4	High	0.37		
	50-62	30-50	1.20-1.65	<0.06	0.18-0.20	4.5-8.4	High	0.43		
Vidrine	0-20	10-27	1.30-1.65	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	5	.5-4
	20-44	27-50	1.20-1.70	0.06-0.2	0.18-0.20	4.5-8.4	High	0.32		
	44-62	27-50	1.20-1.65	0.06-0.2	0.18-0.20	5.1-8.4	High	0.32		
PnB: Pineisland	0-9	6-12	1.35-1.65	0.6-2.0	0.18-0.24	4.5-6.5	Low	0.43	3	.5-3
	9-38	14-30	1.30-1.70	0.6-2.0	0.18-0.24	4.5-6.5	Low	0.37		
	38-78	20-35	1.45-1.80	0.06-0.2	0.11-0.18	4.5-6.5	Low	0.32		
Pt*: Pits										
VnB: Vidrine	0-22	10-27	1.30-1.65	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	5	.5-4
	22-38	27-50	1.20-1.70	0.06-0.2	0.18-0.20	4.5-8.4	High	0.32		
	38-60	27-50	1.20-1.65	0.06-0.2	0.18-0.20	5.1-8.4	High	0.32		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft				
AcB--------------- Acadia	D	None--------	---	---	0.5-1.5	Perched	Dec-Apr	High-----	High.
AEA--------------- Allemands	D	Frequent----	Very long	Jan-Dec	+1-0.5	Apparent	Jan-Dec	High-----	Moderate.
ARA--------------- Arat	D	Frequent----	Very long	Jan-Dec	+3-0.5	Apparent	Jan-Dec	High-----	Moderate.
BBA--------------- Barbary	D	Frequent----	Very long	Jan-Dec	+1-0.5	Apparent	Jan-Dec	High-----	Moderate.
BEA*:									
Basile-----------	D	Frequent----	Brief to long.	Jan-Apr	0-1.5	Apparent	Dec-May	High-----	Moderate.
Cascilla---------	B	Frequent----	Brief to long.	Jan-Apr	>6.0	---	---	Low------	Moderate.
BhB--------------- Bienville	A	None--------	---	---	4.0-6.0	Apparent	Dec-Apr	Low------	High.
BnB*:									
Bienville--------	A	None--------	---	---	4.0-6.0	Apparent	Dec-Apr	Low------	High.
Guyton-----------	D	Rare--------	---	---	0-1.5	Perched	Dec-May	High-----	High.
CdA*:									
Caddo------------	D	None--------	---	---	0-2.0	Apparent	Dec-Apr	High-----	Moderate.
Messer-----------	C	None--------	---	---	2.0-4.0	Perched	Dec-May	High-----	Moderate.
ChB--------------- Cahaba	B	None--------	---	---	>6.0	---	---	Moderate	Moderate.
CrA*, CrB*:									
Crowley----------	D	None--------	---	---	0.5-1.5	Perched	Dec-Apr	High-----	Moderate.
Vidrine----------	D	None--------	---	---	1.0-2.0	Perched	Dec-Apr	High-----	Moderate.
GDA--------------- Ged	D	Frequent----	Very long	Jan-Dec	+1-0	Apparent	Jan-Dec	High-----	Moderate.
GnB--------------- Glenmora	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	High-----	Moderate.
GrC--------------- Gore	D	None--------	---	---	>6.0	---	---	High-----	Low.
GtA--------------- Guyton	D	Occasional	Brief	Jan-Dec	0-1.5	Perched	Dec-May	High-----	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft				
GUA*:									
Guyton	D	Frequent	Long	Jan-Dec	0-1.5	Perched	Dec-May	High	High.
Bienville	A	Frequent	Long	Jan-Dec	4.0-6.0	Apparent	Dec-Apr	Low	Moderate.
JdA Judice	D	Rare	---	---	0-1.5	Apparent	Dec-Apr	High	Low.
KpA, KpB Kaplan	D	None	---	---	1.5-2.5	Apparent	Dec-Apr	High	Low.
KrA*:									
Kinder	C	None	---	---	0-2.0	Perched	Dec-Apr	High	Moderate.
Messer	C	None	---	---	2.0-4.0	Perched	Dec-May	High	Moderate.
LeA Leton	D	Rare	---	---	0-1.5	Apparent	Dec-Apr	High	Moderate.
LtA Leton	D	Occasional	Very brief to very long.	Oct-May	0-1.5	Apparent	Dec-Apr	High	Moderate.
MdA Midland	D	Rare	---	---	0.5-2.0	Apparent	Dec-Apr	High	Moderate.
MoA Morey	D	Rare	---	---	0-2.0	Apparent	Dec-Apr	High	Low.
MtA Mowata	D	Rare	---	---	0-2.0	Apparent	Dec-Apr	High	Low.
MwA*:									
Mowata	D	Rare	---	---	0-2.0	Apparent	Dec-Apr	High	Low.
Vidrine	D	None	---	---	1.0-2.0	Perched	Dec-Apr	High	Moderate.
PnB Pineisland	C	None	---	---	2.0-3.0	Perched	Dec-Mar	High	Moderate.
Pt* Pits									
VnB Vidrine	D	None	---	---	1.0-2.0	Perched	Dec-Apr	High	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--ENGINEERING INDEX TEST DATA

(Analyses by the Louisiana Department of Highways. Dashes indicate data was not available. Np means nonplastic.)

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution										Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--						Percentage smaller than--							
	AASHTO	Unified	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max-dry density	Optimum moisture
													Pct		Lb/ft3	Pct
Crowley silt loam[1] (S73LA-27-7)																
Eg ----- 6-23	A-4(8)	ML	100	100	100	100	100	98	95	46	15	11	---	NP	108.7	15.8
Btg1 ----- 15-30	A-7-6(14)	CL	100	100	100	100	100	100	99	70	44	39	43	24	99.7	21.0
Btg2 ----- 30-60	A-7-6(15)	CL	100	100	100	100	100	100	97	54	37	34	44	24	101.8	20.0
Crowley silt loam[2] (S73LA-27-16)																
Eg ----- 9-17	A-6(9)	CL	100	100	100	100	100	97	95	52	26	21	28	11	107.6	16.7
Btg1 ----- 17-30	A-7-6(14)	CL	100	100	100	100	100	99	97	59	41	34	41	25	99.8	31.0
Btg2 ----- 30-75	A-7-6(18)	CL	100	100	100	100	100	99	97	68	44	36	49	33	104.6	19.4
Kaplan silt loam[3] (S73LA-27-19)																
Btg1 ----- 6-22	A-7-6(19)	CH	100	100	100	100	100	98	95	74	55	51	57	33	90.5	28.5
Btg2 ----- 22-37	A-7-6(19)	CH	100	100	100	100	100	99	99	60	47	43	57	38	96.5	23.1
BCg ----- 37-62	A-7-6(15)	CH	100	100	100	100	100	100	96	71	53	47	54	29	101.0	21.4
Midland silt loam[4] (S73LA-27-1)																
A ----- 4-8	A-7-6(13)	CL	100	100	100	100	100	100	93	72	47	35	41	22	89.9	27.4
Btg2 ----- 14-30	A-7-6(18)	CH	100	100	100	100	100	100	99	87	63	50	50	29	95.2	23.9
BCg ----- 30-70	A-7-6(20)	CH	100	100	100	100	100	100	98	91	60	49	65	46	99.0	22.3
Morey loam[5] (S73LA-27-6)																
Ap ----- 0-5	A-7-6(13)	CL	100	100	100	100	100	99	92	62	48	42	43	21	92.3	25.7
Btg ----- 11-26	A-7-6(13)	CL	100	100	100	100	100	100	84	53	39	35	41	22	106.6	17.6
BCg ----- 26-60	A-7-6(15)	CL	100	100	100	100	100	100	89	48	35	30	41	28	107.9	16.6
Mowata silt loam[6] (S73LA-27-13)																
Eg ----- 8-15	A-4(8)	CL	100	100	100	100	100	99	94	46	24	18	25	9	109.4	16.0
Btg ----- 15-31	A-7-6(17)	CL	100	100	100	100	100	99	97	64	41	36	46	30	102.5	19.9
BCg ----- 31-74	A-7-6(17)	CL	100	100	100	100	100	98	96	61	38	31	46	30	107.6	18.4

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution										Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--						Percentage smaller than--						Max-dry density	Optimum moisture
	AASHTO	Unified	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm				
													Pct		Lb/ft3	Pct
SND[7]																
(S73LA-27-22)																
Ba ----- 5-23	A-7-6(15)	CL	100	100	100	100	100	95	90	78	41	32	43	25	100.3	20.4
Bg1 ----- 23-33	A-7-6(18)	CH	100	100	100	100	100	98	96	75	56	46	53	33	91.6	26.0
Bg2 ----- 33-48	A-7-6(19)	CH	100	100	100	100	100	96	94	69	51	44	56	36	100.1	20.6
Vidrine silt loam[8]																
(S73LA-27-10)																
BE ----- 4-14	A-4(8)	ML	100	100	100	100	100	95	93	45	18	14	---	NP	110.7	15.6
Btg1 ----- 16-30	A-7-6(20)	CH	100	100	100	100	100	99	88	71	52	18	60	37	95.0	24.6
BCg ----- 48-65	A-7-6(17)	CL	100	100	100	100	100	99	98	52	37	32	43	29	106.3	17.7

[1] This Crowley pedon is in the north-central part of the city of Jennings, about 1/8 mile east of the American Legion Hospital; SW 1/4 SW 1/4, Sec. 27, T. 9S., R. 3W.

[2] This Crowley pedon is in the southwest part of the city of Jennings, about 40 feet north of gravel road; SE 1/4 SW 1/4, Sec. 4, T. 9S., R. 3W. It is a taxadjunct to the Crowley series because it classifies as fine-silty rather than fine by 2 percent clay. The pedon is mapped as a similar soil in CrA, Crowley-Vidrine silt loams, 0 to 1 percent slopes.

[3] This Kaplan pedon is in the northeastern part of the city of Jennings, about 100 feet north of fence; SW 1/4 SW 1/4, Sec. 42, T. 9S., R. 3W.

[4] This Midland pedon is in the northwestern part of the city of Jennings, about 150 feet north of fence line; SE 1/4 NW 1/4, Sec. 28, T. 9S., R. 3W.

[5] This Morey pedon is about 175 steps east of ditch; NE 1/4 NE 1/4, Sec. 4, T. 10S., R. 3W. It is a taxadjunct to the Morey series because the clay content in the surface horizon is 12 percent too high and LL and PI are slightly higher than allowed in the series range. Also, the AASHTO class of the Ap horizon is A-7-6, which is outside of the range for the series.

[6] This Mowata pedon is in the northwestern part of the city of Jennings, about 40 feet east of road; NW 1/4 SW 1/4, Sec. 27, T. 9S., R. 3W.

[7] SND - Series not determined. This pedon classifies as a fine, montmorillonitic, thermic Typic Haplaquepts. It is mapped as an included soil in map unit BBA, Barbary mucky clay. The pedon is in the northeastern part of the city of Jennings; about 300 feet from the southeast gate of the sewer plant; NE 1/4 NE 1/4, Sec. 44, T. 9S., R. 3W.

[8] This Vidrine pedon is in the north-central part of the city of Jennings, about 1/8 mile east of the American Legion Hospital, about 35 feet north of the Crowley (S73LA-27-7) sample site; SW 1/4 NE 1/4, Sec. 27, T. 9S., R. 3W.

TABLE 18.--FERTILITY TEST DATA FOR SELECTED SOILS

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate analyses not made)

Soil name and sample number	Depth	Horizon	pH 1:1 H_2O	Organic carbon	Extractable P	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Effective cation-exchange capacity	Cation-exchange capacity (sum)	Base saturation (sum)	Saturation: Effective cation-exchange capacity Al	Saturation: Sum of cation-exchange capacity Na
	In			Pct	ppm	meq/100g									Pct	Pct	Pct
Basile silt loam[1]: (S87LA-53-15)	0-5	A	4.7	1.34	31	3.6	1.6	0.1	0.1	0.0	0.2	7.2	5.6	12.6	42.86	0.00	0.79
	5-16	Eg1	4.6	0.37	19	1.5	0.9	0.1	0.1	1.1	0.3	9.6	4.0	12.2	21.31	27.50	0.82
	16-24	Eg2	4.8	0.05	14	3.4	2.4	0.1	0.7	3.8	0.2	4.2	10.6	10.8	61.11	25.85	6.48
	24-33	B/E	5.3	0.17	16	7.2	4.5	0.1	1.9	0.4	0.2	2.4	14.3	16.1	85.09	2.80	11.80
	33-60	Btg, Btng	6.8	0.07	18	11.0	6.4	0.2	3.4	---	---	0.6	---	21.6	97.22	---	15.74
	60-80	BCg1	7.8	0.01	92	10.8	5.2	0.2	3.2	---	---	3.0	---	22.4	86.61	---	14.29
Caddo silt loam[1]: (S88LA-53-1)	0-6	Ap	5.2	1.04	19	3.0	1.3	0.1	0.2	0.0	0.4	6.6	5.0	11.2	41.07	0.00	1.79
	6-15	Eg1	4.9	0.38	9	1.6	0.8	0.0	0.2	2.0	0.2	6.0	4.8	8.6	30.23	41.67	2.32
	15-21	Eg2	5.0	0.19	9	1.3	0.8	0.0	0.3	3.1	0.1	7.2	5.6	9.6	25.00	55.36	3.12
	21-27	B/E1	5.1	0.21	10	2.8	1.7	0.1	0.8	4.7	0.1	9.6	10.2	15.0	36.00	46.08	5.33
	27-38	B/E2	5.3	0.25	11	4.0	2.5	0.1	1.2	3.6	0.4	9.6	11.8	17.4	44.83	30.51	6.90
	38-47	Btg	5.6	0.14	12	5.7	3.6	0.1	1.6	1.1	0.3	4.8	12.4	15.8	69.62	8.87	10.13
	47-68	BCg	5.8	0.03	12	7.0	4.3	0.1	2.1	0.2	0.0	3.6	13.7	17.1	78.95	1.46	12.28
Cahaba fine sandy loam[1]: (S8LA-53-9)	0-2	A1	5.2	1.11	13	1.8	0.8	0.1	0.0	0.0	0.2	3.6	2.9	6.3	42.86	0.00	0.00
	2-8	A2	5.4	0.55	8	0.8	0.4	0.1	0.0	0.0	0.2	3.0	1.5	4.3	30.23	0.00	0.00
	8-18	E	5.0	0.06	5	0.4	0.2	0.0	0.0	0.2	0.2	1.2	1.0	2.1	42.86	12.50	0.00
	18-25	B/E	4.8	0.00	7	0.6	0.5	0.1	0.0	0.0	0.2	1.8	2.4	3.0	40.00	0.00	0.00
	25-42	Bt1	4.6	0.02	8	0.6	0.9	0.1	0.0	0.7	0.1	1.8	2.4	3.4	47.06	29.17	0.00
	42-60	Bt2	4.4	0.01	7	0.2	0.8	0.1	0.0	1.3	0.3	3.6	5.1	4.7	23.40	48.15	0.00
	60-81	C	4.4	0.00	10	0.1	0.9	0.0	0.1	0.0	0.2	2.4	1.3	3.5	31.40	0.00	2.90
Cascilla silt loam[1]: (S87LA-53-14)	0-7	A	4.5	0.63	18	0.6	0.9	0.1	0.1	0.0	0.2	10.8	1.9	12.5	13.60	0.00	0.80
	7-13	BA	4.7	0.27	13	0.5	0.9	0.1	0.1	4.5	0.1	10.8	6.2	12.4	12.90	72.58	0.81
	13-25	Bw1	4.8	0.16	16	0.3	1.0	0.1	0.2	4.5	0.7	10.2	6.8	11.8	13.56	60.18	1.69
	25-45	Bw2	4.9	0.11	55	0.3	0.9	0.1	0.3	4.7	0.7	7.8	7.0	9.4	17.02	67.14	3.19
	45-56	Bt1	5.2	0.20	14	3.3	4.2	0.1	0.7	5.2	0.6	6.0	14.1	14.3	58.04	36.88	4.89
	56-63	Bt2	5.6	0.05	16	5.1	6.0	0.2	2.2	3.1	0.5	7.2	17.1	20.7	65.22	18.13	10.63
	63-80	BC	7.6	0.01	18	6.0	5.9	0.1	2.6	0.0	0.0	7.8	14.6	22.4	65.18	0.00	11.61
Glenmora silt loam[1]: (S87LA-53-7)	0-4	Ap	4.5	0.72	27	1.3	0.4	0.1	0.0	2.3	0.5	5.4	4.6	7.2	25.00	50.00	0.00
	4-10	E	4.4	0.07	10	1.7	0.5	0.0	0.0	2.0	0.4	3.6	4.6	5.8	37.93	43.48	0.00
	10-14	BE	4.6	0.02	11	1.3	1.0	0.1	0.1	2.2	0.2	6.0	4.9	8.5	29.41	44.89	1.18
	14-23	Bt1	4.5	0.02	9	1.1	1.1	0.1	0.1	2.2	0.4	5.4	9.9	7.8	30.77	44.00	1.28
	23-30	Bt2	4.4	0.01	8	1.1	1.2	0.0	0.1	2.3	0.5	4.2	15.1	6.6	36.36	44.23	1.52
	30-38	B/E	4.5	0.00	10	1.2	1.3	0.0	0.1	2.2	0.4	6.0	5.2	8.6	38.60	42.31	1.16
	38-54	Btv1	4.4	0.00	9	1.8	2.0	0.0	0.2	3.0	0.0	9.6	7.0	10.0	40.00	42.86	2.00
	54-72	Btv2	4.5	0.01	7	1.8	1.9	0.1	0.1	2.0	0.4	4.2	6.3	8.1	48.15	31.75	1.23

TABLE 18.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 H_2O	Organic carbon	Extractable P	Exchangeable cations Ca	Mg	K	Na	Al	H	Total acidity	Effective cation-exchange capacity	Cation-exchange capacity (sum)	Base saturation (sum)	Saturation: Effective cation-exchange capacity Al	Saturation: Sum of cation-exchange capacity Na
	In			Pct	ppm	meq/100g									Pct	Pct	Pct
Guyton silt loam[1]: (S87LA-53-11)	0-5	A	4.0	0.80	17	0.7	0.4	0.0	0.0	0.0	0.2	3.6	1.3	4.7	23.40	0.00	0.00
	5-17	Eg1	4.1	0.59	11	0.5	0.2	0.0	0.0	2.1	0.0	5.4	2.8	6.1	11.48	75.00	0.00
	17-29	Eg2	4.4	0.14	7	0.2	0.1	0.0	0.0	1.4	0.4	6.0	2.1	6.3	4.76	77.78	0.00
	29-50	B/E	4.2	0.05	10	2.1	1.2	0.1	0.1	2.4	1.8	6.0	7.7	9.5	36.84	31.17	1.05
	50-65	Btg[5]	4.6	0.01	12	6.3	3.7	0.2	0.2	2.0	0.8	5.4	13.2	15.8	65.82	15.15	1.27
	65-80	Btg[5]	4.7	0.01	16	8.5	5.2	0.2	0.2	1.8	0.2	7.2	16.1	21.4	66.36	11.11	1.40
	80-90	Cg	4.8	0.01	21	12.6	7.9	0.4	0.4	1.1	0.3	9.0	22.7	30.3	70.30	4.84	1.32
Guyton silt loam[2]: (S87LA-53-6)	0-7	Ap	4.3	0.71	30	3.0	0.7	0.1	0.1	0.2	0.4	4.2	4.5	8.1	48.15	4.44	1.23
	7-15	Eg1	5.0	0.43	15	4.7	1.3	0.1	0.1	0.0	0.4	2.4	6.6	8.6	72.09	0.00	1.16
	15-27	Eg2	6.0	0.08	12	6.4	2.4	0.1	0.2	---	---	1.2	---	10.3	88.35	---	1.94
	27-39	B/E	6.5	0.03	15	9.4	3.7	0.1	0.5	---	---	1.8	---	15.5	88.39	---	3.23
	39-49	Btg1	6.4	0.03	16	10.0	4.0	0.1	0.6	---	---	1.8	---	16.5	89.09	---	3.64
	49-62	Btg2	6.4	0.01	15	10.2	4.2	0.2	0.7	---	---	1.2	---	16.5	92.73	---	4.24
	62-70	BC	6.3	0.01	17	13.3	5.6	0.2	0.8	---	---	1.8	---	21.7	91.71	---	3.69
Kaplan silt loam[1]: (S87LA-53-16)	0-7	Ap	5.2	0.57	69	5.1	2.4	0.1	0.4	2.0	0.4	5.0	10.4	13.0	61.54	19.23	3.08
	7-14	A	6.6	0.61	22	6.6	4.0	0.1	0.8	0.0	0.0	1.8	11.5	13.3	86.47	0.00	6.02
	14-20	Btg	7.2	0.41	23	10.0	7.8	0.2	1.7	0.0	0.0	2.4	19.7	22.1	89.14	0.00	7.69
	20-29	Btkg1	7.5	0.17	24	10.3	9.1	0.2	2.4	0.0	0.0	2.4	22.0	24.4	90.16	0.00	9.84
	29-37	Btkg2	7.8	0.19	26	11.6	10.7	0.3	3.8	0.0	0.0	3.0	26.4	29.4	89.80	0.00	12.93
	37-51	Btkg3	8.1	0.03	23	10.2	9.5	0.2	0.5	0.0	0.0	3.0	20.4	33.8	60.36	0.00	1.48
	51-69	Btkg4	8.3	0.02	24	12.9	10.3	0.2	5.1	0.0	0.0	3.6	28.5	28.5	100.00	0.00	17.89
	69-79	Btkg5	7.8	0.04	29	11.6	10.6	0.3	4.9	0.0	0.0	3.6	27.4	31.0	88.39	0.00	15.81
Kinder silt loam[1]: (S87LA-53-10)	0-4	A	4.4	0.87	9	0.3	0.2	0.0	0.0	1.1	0.3	4.8	1.9	5.3	9.43	57.89	0.00
	4-19	Eg	4.9	0.05	6	0.3	0.2	0.0	0.1	3.8	0.1	6.0	4.5	6.6	9.09	84.44	1.52
	19-28	B/E	5.2	0.01	7	0.7	0.7	0.1	0.3	4.0	0.6	9.0	6.4	10.8	16.67	62.50	2.78
	28-40	Btg1	5.3	0.00	9	1.2	1.2	0.1	0.6	4.1	0.5	4.8	7.7	7.9	39.24	53.25	7.59
	40-50	Btg2	5.4	0.01	9	1.8	1.5	0.0	0.5	2.5	0.3	3.0	6.6	6.8	55.88	37.88	7.53
	50-65	E/B	5.7	0.01	12	4.6	3.3	0.1	1.0	0.5	0.1	3.0	9.6	12.0	75.00	5.21	8.33
	65-80	B′/E	5.6	0.01	17	7.8	5.4	0.1	1.6	0.0	0.4	3.6	15.3	18.5	80.54	0.00	8.65
	80-88	B′tg	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Kinder silt loam[3]: (S87LA-53-8)	0-4	A	4.2	0.90	11	1.3	0.5	0.0	0.1	1.1	0.3	5.4		7.3	26.03	33.33	1.37
	4-12	Eg1	4.8	0.34	11	0.8	0.7	0.0	0.1	2.7	0.3	6.0		7.6	52.63	58.70	1.32
	12-19	Eg2	4.4	0.05	10	1.0	1.5	0.1	0.3	5.2	0.6	9.6		12.5	23.20	59.77	2.40
	19-29	B/E1	5.2	0.13	13	2.1	4.0	0.2	1.4	9.7	0.3	14.4		22.1	34.84	54.80	6.33
	29-39	B/E2	5.1	0.05	12	3.2	4.6	0.2	1.6	5.8	0.2	9.0		18.6	51.61	37.18	8.60
	39-49	Btg1	4.8	0.01	13	4.4	5.4	0.2	2.0	3.2	0.4	6.0		18.0	66.67	20.51	11.11
	49-57	Btg2	4.8	0.01	14	4.4	5.0	0.2	1.9	2.2	0.2	6.0		17.5	65.71	15.83	10.86
	57-61	BC	4.8	0.01	16	5.5	6.0	0.3	2.4	1.8	0.2	5.4		19.6	72.45	11.11	12.24

TABLE 18.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 H_2O	Organic carbon	Extractable P	Exchangeable cations Ca	Mg	K	Na	Al	H	Total acidity	Effective cation-exchange capacity	Cation-exchange capacity (sum)	Base saturation (sum)	Saturation: Effective cation-exchange capacity Al	Saturation: Sum of cation-exchange capacity Na
	In			Pct	ppm	meq/100g									Pct	Pct	Pct
Leton silt loam[1]: (S87LA-53-1)	0-7	Ap	4.9	0.50	86	1.4	0.4	0.1	0.1	0.0	0.4	3.0	2.4	5.0	40.00	0.00	2.00
	7-18	Eg[5]	5.6	0.29	14	2.2	0.6	0.0	0.6	0.2	0.2	2.4	3.8	5.8	58.62	9.06	10.34
	18-28	Eg[5]	5.3	0.24	8	1.9	0.5	0.0	0.9	0.0	0.2	3.0	3.5	6.3	52.38	0.00	14.28
	28-36	B/E[5]	5.4	0.05	8	3.2	1.0	0.0	1.3	0.0	0.2	1.8	5.7	7.3	75.34	0.00	17.81
	36-45	B/E[5]	5.8	0.03	12	6.7	2.6	0.1	2.1	0.0	0.2	1.2	11.5	12.7	90.55	0.00	16.54
	45-59	Btg	6.1	0.01	13	7.0	2.9	0.0	1.8	0.0	0.2	1.2	11.9	12.9	90.70	0.00	13.95
	59-75	BCg	6.4	0.01	15	7.6	3.3	0.1	1.5	0.0	0.0	0.6	12.5	13.1	95.42	0.00	11.45
	75-86	Cg	6.6	0.01	11	5.5	2.4	0.0	1.0	0.0	0.0	0.6	8.9	9.5	93.68	0.00	10.53
Messer silt loam[1]: (S87LA-53-18)	0-4	A	4.3	0.54	8	0.3	0.2	0.0	0.0	1.4	0.2	8.4	2.1	8.9	5.62	66.67	0.00
	4-8	E	4.9	0.17	9	0.5	0.3	0.0	0.0	2.2	0.2	8.4	3.2	9.2	8.69	68.75	0.00
	8-19	Bw1	4.5	0.00	6	0.2	0.1	0.0	0.0	1.4	0.2	9.0	1.9	9.3	3.22	73.68	0.00
	19-34	Bw2	4.5	0.00	7	0.1	0.2	0.0	0.0	1.6	0.4	3.6	2.3	3.9	7.69	69.56	0.00
	34-40	B/E	4.6	0.01	8	0.4	0.9	0.1	0.1	4.7	0.1	7.0	6.3	8.5	17.65	74.60	1.18
	40-58	Bt1	4.0	0.01	8	1.9	1.3	0.0	0.4	5.4	0.2	7.0	9.2	10.6	33.96	58.69	3.77
	58-72	Bt2	4.8	0.01	11	3.8	2.0	0.1	0.8	4.7	0.5	5.4	11.9	12.1	55.37	39.49	6.67
Mowata silt loam[1]: (S87LA-53-18)	0-4	Ap1	5.4	0.59	118	2.5	1.1	0.2	0.1	0.0	0.2	5.4	4.1	9.3	44.94	0.00	0.00
	4-8	Ap2	5.2	0.37	64	2.0	0.8	0.0	0.1	0.0	0.2	4.8	3.1	7.7	37.66	0.00	0.00
	8-15	Eg1	5.1	0.29	13	1.6	0.6	0.0	0.1	0.5	0.3	3.6	3.1	5.9	38.98	16.12	16.12
	15-25	Eg2	4.7	0.37	10	1.0	0.6	0.0	0.1	1.8	0.8	3.0	4.3	4.7	36.17	41.86	41.86
	25-34	B/E	4.9	0.17	11	4.1	2.6	0.2	0.5	1.3	0.5	4.2	9.2	11.6	63.79	14.13	14.13
	34-42	Btg1	5.2	0.05	20	10.9	7.3	0.2	1.0	0.2	0.2	3.0	19.8	22.4	86.61	1.01	1.01
	42-52	Btg2	5.8	0.01	29	11.4	7.8	0.3	1.0	0.0	0.2	7.2	20.7	22.7	74.01	0.00	0.00
	52-62	Btg2	6.1	0.01	26	13.7	9.5	0.3	1.2	0.0	0.0	4.8	24.7	29.5	83.73	0.00	0.00
Vidrine silt loam[1]: (S87LA-53-13)	0-6	Ap	5.5	0.66	115	2.9	0.4	0.1	0.0	0.0	0.2	10.2	3.6	13.6	25.00	0.00	0.00
	6-14	BE	5.7	0.29	11	2.7	0.7	0.1	0.0	0.2	0.2	3.0	3.9	6.5	53.85	5.12	0.00
	14-18	B/E	5.3	0.33	15	4.8	3.2	0.2	0.1	1.1	0.5	7.2	9.9	15.5	53.55	11.11	0.64
	18-32	Btg1	5.3	0.24	15	6.0	4.6	0.2	0.4	1.8	0.4	7.2	13.4	18.4	60.87	13.43	2.17
	32-46	Btg1	5.6	0.11	16	6.3	4.6	0.2	0.5	0.5	0.5	5.4	12.6	17.0	68.24	3.97	2.94
	46-56	Btg2	5.8	0.01	15	7.5	5.3	0.2	0.6	0.0	0.2	3.6	13.8	17.2	79.07	0.00	3.49
	56-65	Btg2	6.0	0.01	18	9.5	6.6	0.3	0.6	0.0	0.0	3.6		20.6	88.52	0.00	2.91
	65-70	BCg	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 18.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 H_2O	Organic carbon	Extractable P	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Effective cation-exchange capacity	Cation-exchange capacity (sum)	Base saturation (sum)	Saturation: Effective cation-exchange capacity Al	Sum of cation-exchange capacity Na
	In			Pct	ppm	meq/100g									Pct	Pct	Pct
SND[4]:	0-4	A	4.2	2.04	32	0.4	0.2	0.1	0.0	2.2	0.4	9.6	3.3	10.3	6.79	66.67	0.00
(S87LA-53-12)	4-18	E	4.5	0.36	21	0.1	0.1	0.0	0.0	3.2	0.8	3.6	4.2	3.8	5.26	76.19	0.00
	18-35	B/E	4.6	0.02	20	0.1	0.0	0.0	0.0	0.9	0.1	1.8	1.1	2.0	10.00	75.00	0.00
	35-40	Bt1	4.5	0.03	13	0.1	0.4	0.0	0.0	1.4	0.0	4.2	1.9	4.3	2.32	93.33	0.00
	40-44	Bt2	4.0	0.00	17	0.1	0.1	0.0	0.0	1.4	0.0	4.2	1.6	4.4	4.55	87.50	0.00
	44-60	Bt3	3.9	0.00	18	0.3	0.1	0.1	0.0	1.1	0.3	4.8	1.9	5.4	11.11	55.00	0.00
	60-80	C	4.0	0.00	13	0.1	0.0	0.0	0.0	0.0	0.2	1.8	0.3	1.9	5.26	0.00	0.00

1 Pedon is the typical pedon for the series in the survey area.

2 This Guyton pedon is located about 1 mile east of Topsy, 1,200 feet south of parish line, 1,800 feet east of Parish Road 9-41; NW 1/4 NW 1/4 sec. 29, T.7S., R. 7W. It is included in map unit GtA, Guyton silt loam, occasionally flooded.

3 The location of this Kinder pedon is 2.5 miles east of Topsy, 1,400 feet northeast of Parish Road 9-56, 700 feet south of gas pipeline, 105 feet north of private access road; SW 1/4 SW 1/4 sec. 27, T. 7S., R. 7W. This pedon is included in map unit KrA, Kinder-Messer silt loams.

4 SND - Series not designated. This pedon classifies as sandy, siliceous, thermic Psammentic Paleudalfs. It is included as a similar soil in map unit BkB, Bienville loamy fine sand, 1 to 3 percent slopes. Pedon is 3.75 miles east of Topsy; 175 feet north of gravel road, 10 feet east of dirt road; NE 1/4 SW 1/4 sec. 26, T. 7S., R. 7W.

5 This horizon was subdivided for sampling purposes.

TABLE 19.--PHYSICAL TEST DATA FOR SELECTED SOILS

(The symbol TR means trace. Dashes indicate analyses not made.)

Soil name and sample number	Depth	Horizon	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Sand: Total (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Water content at tension: 1/3 bar	Water content at tension: 15 bar	WRD	Bulk density: Air-dry	Bulk density: Oven-dry	Bulk density: Field Moist.	COLE
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	g/cm^3	g/cm^3	g/cm^3	cm/cm
Acadia silt loam [1]: (S87LA-53-2)	0-6	Ap,E	0.3	0.6	0.4	1.5	23.1	25.9	66.3	7.8	24.1	5.9	18.2	1.48	1.49	1.39	0.020
	6-14	BE	0.4	0.5	0.2	1.0	16.4	18.5	61.2	20.3	26.0	10.9	15.1	1.69	1.76	1.61	0.030
	14-20	Bt	0.1	0.1	0.1	0.4	6.7	7.4	42.0	50.6	35.8	21.1	14.7	1.79	1.92	1.46	0.090
	20-31	Btg[8]	0.1	0.1	0.1	0.4	7.8	8.5	48.9	42.6	34.5	18.4	16.1	1.84	1.94	1.55	0.080
	31-41	Btg[8]	0.0	0.1	0.1	0.4	7.7	8.3	52.7	39.0	32.6	17.0	15.6	1.87	1.94	1.64	0.060
	41-48	BCg	0.0	0.3	0.4	0.8	7.6	9.1	58.2	32.7	33.9	17.3	16.6	1.82	1.87	1.64	0.040
	48-60	BC	0.0	0.1	0.2	0.4	8.9	9.6	61.2	29.2	33.9	17.3	16.6	1.82	1.87	1.64	0.040
	60-70	2BC1	0.0	0.1	0.2	0.6	19.7	20.6	55.6	23.8	30.2	12.8	17.4	1.64	1.69	1.56	0.030
	70-80	2BC2	0.0	0.1	0.2	0.5	24.7	25.5	53.8	20.7	27.6	11.0	16.6	1.77	1.81	1.64	0.030
Crowley silt loam [1,2]: (S83LA-53-1)	0-7	Ap1	0.0	0.6	0.5	6.4	26.7	34.2	54.2	11.6	25.4	7.5	17.9	1.57	1.57	1.53	0.007
	7-13	Ap2	0.0	0.2	0.4	5.9	28.0	34.5	54.3	11.2	24.8	7.1	17.7	1.67	1.68	1.64	0.006
	13-17	Eg	0.0	0.2	0.2	5.5	28.4	34.3	58.3	7.4	22.1	5.6	16.5	1.63	1.64	1.60	0.006
	17-31	Btg1	0.0	0.1	0.1	2.6	10.3	13.1	44.1	42.8	36.3	7.9	28.4	1.93	1.93	1.46	0.099
	31-40	Btg2	0.0	0.0	0.1	3.8	17.4	21.3	39.2	39.5	33.3	19.7	13.6	1.93	1.94	1.66	0.053
	40-48	Btg3	0.0	0.1	0.1	3.5	20.0	23.7	42.5	33.8	32.8	16.9	15.9	1.96	1.96	1.75	0.038
	48-61	Btg4	0.0	0.1	0.2	3.4	23.0	26.7	41.3	32.0	31.9	16.2	15.7	1.98	1.99	1.78	0.028
	61-73	Btg5	0.0	0.1	0.1	2.8	25.5	28.5	44.9	26.6	31.4	14.6	16.9	1.88	1.90	1.74	0.031
Gore silt loam [1,3]: (S87LA-53-4)	0-4	A	0.4	1.8	1.5	5.5	25.6	34.8	51.2	14.0	22.0	9.0	13.0	1.33	1.36	1.28	0.020
	4-15	Bt	0.0	0.1	0.2	0.6	2.7	3.6	37.4	59.0	40.5	25.0	15.5	1.68	1.99	1.31	0.130
	15-28	Bss1	0.0	0.1	0.1	0.4	1.0	1.6	38.4	60.0	41.8	25.8	16.0	1.82	1.97	1.36	0.130
	28-32	Bss2	0.0	0.0	0.0	0.1	0.4	0.5	38.3	61.2	44.0	25.9	18.1	1.85	1.93	1.40	0.110
	32-39	BCk1	2.5	2.1	0.9	0.4	0.3	6.2	57.4	36.4	33.9	19.0	14.9	1.93	2.00	1.66	0.060
	39-49	BCk2	6.4	3.3	1.9	0.9	0.5	13.0	51.2	35.8	34.2	20.7	13.5	1.65	1.71	1.46	0.050
	49-63	BCk3	0.6	1.0	0.4	0.3	5.8	8.1	77.1	14.8	29.2	10.0	19.2	1.54	1.56	1.52	0.010
	63-74	2C	0.0	0.1	0.1	0.8	47.6	48.6	43.7	7.7	19.0	6.0	13.0	1.49	1.52	1.45	0.010
Judice silty clay [1]:	0-9	Ap	0.1	0.3	0.4	0.6	3.4	4.8	47.8	47.4	34.3	21.2	13.1	1.84	1.95	1.40	0.110
	9-20	A	0.4	0.4	0.4	0.4	1.8	3.4	42.0	54.6	40.9	22.6	18.3	1.84	1.99	1.37	0.130
	20-29	Bssg1[8]	0.3	0.3	0.2	0.3	1.9	3.0	47.2	49.8	36.5	19.6	16.9	1.93	2.00	1.50	0.100
	29-40	Bssg1[8]	0.5	0.6	0.3	0.3	1.8	3.5	48.5	48.0	36.2	19.3	16.9	1.96	2.06	1.58	0.090
	40-49	Bssg2	0.3	0.4	0.2	0.4	2.2	3.5	48.7	47.8	37.9	20.0	17.9	1.97	2.04	1.63	0.080
	49-59	Bssg3	0.1	0.1	0.1	0.4	1.8	2.5	47.9	49.6	40.3	21.0	19.3	1.94	2.03	1.50	0.100
	59-70	Bssg4	0.0	0.0	0.0	0.2	1.8	2.0	43.9	54.1	44.2	22.5	21.7	1.95	2.08	1.49	0.120

TABLE 19.--PHYSICAL TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (mm): Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Sand: Total (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Water content at tension: 1/3 bar	Water content at tension: 15 bar	WRD bar	Bulk density: Air-dry	Bulk density: Oven-dry	Bulk density: Field Moist.	COLE
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	g/cm^3	g/cm^3	g/cm^3	cm/cm
Midland silt loam [1,4]: (S87LA-53-3)	0-6	Ap	0.3	0.5	0.3	1.4	15.2	17.7	62.9	19.4	28.1	11.2	16.9	1.67	1.69	1.60	0.020
	6-14	Btg1	0.4	0.3	0.2	0.7	7.1	8.7	57.4	33.9	33.0	17.7	15.3	1.88	1.99	1.52	0.090
	14-19	Btg2	0.1	0.4	0.2	0.5	4.8	6.0	47.1	46.9	37.7	22.0	15.7	1.83	1.94	1.45	0.100
	19-30	Btg3	0.1	0.2	0.2	0.5	4.8	5.8	50.5	43.7	33.8	19.6	14.2	1.88	1.97	1.47	0.100
	30-41	Btg4	0.3	0.2	0.2	0.5	4.9	6.1	50.2	43.7	32.5	18.5	14.0	1.90	1.99	1.52	0.090
	41-52	Btg5	2.0	1.1	0.7	0.9	6.3	11.0	47.4	41.6	31.0	18.3	12.7	2.00	2.06	1.65	0.070
	52-64	Btg6	0.3	0.4	0.3	0.7	6.3	8.0	49.7	42.3	31.3	18.1	13.2	1.87	2.03	1.56	0.090
	64-75	BCkg	1.0	0.7	0.3	0.9	7.0	9.9	46.5	43.6	31.3	18.5	12.8	1.95	1.99	1.59	0.080
Morey loam [1,5]: (S87LA-53-5)	0-6	Ap	0.0	0.2	0.2	15.4	33.8	49.6	42.0	8.4	19.7	4.8	14.9	1.42	1.42	1.40	0.004
	6-19	BA	0.1	0.1	0.2	9.6	21.4	31.4	44.6	24.0	29.4	12.6	16.8	1.85	1.87	1.75	0.020
	19-29	Btg1	0.1	0.1	0.0	7.8	18.7	26.7	40.9	32.4	30.5	14.9	15.6	1.92	1.96	1.70	0.050
	29-36	Btg2	0.0	0.0	0.0	7.4	19.0	26.4	38.3	35.3	29.5	15.5	14.0	1.97	2.01	1.74	0.050
	36-62	Btg3	0.4	0.1	0.1	8.2	20.8	29.6	37.2	33.2	29.0	15.4	13.6	2.00	2.04	1.75	0.050
	62-73	Btg4	0.6	0.3	0.4	9.3	21.9	32.5	32.8	34.7	29.7	15.8	13.9	1.97	2.03	1.73	0.050
	73-80	Btg5	0.8	0.4	0.4	9.6	27.0	38.2	25.8	36.0	29.8	15.9	13.9	1.95	2.00	1.72	0.050
Pineisland loam [1]: (S86LA-53-1)	0-9	Ap	0.0	0.1	0.2	8.5	36.0	44.8	47.9	7.3	21.0	5.7	15.3	1.61	1.64	1.60	0.000
	9-15	Ec	0.1	1.7	0.7	7.9	29.6	41.0	44.5	14.5	22.6	6.8	15.8	1.61	1.64	1.60	0.000
	15-24	E/B	0.6	0.6	0.3	7.1	28.6	37.2	40.5	22.3	26.1	9.7	16.4	1.61	1.65	1.58	0.000
	24-38	B/E	0.2	0.2	0.1	7.9	35.7	44.1	32.5	23.4	27.0	10.1	16.9	1.64	1.69	1.60	0.000
	38-48	Btx	0.1	0.1	0.0	7.7	35.3	43.1	28.7	28.2	32.3	13.3	19.0	1.75	1.80	1.69	0.000
	48-66	Bt1	0.0	0.0	0.1	9.1	39.3	48.5	24.8	26.7	30.7	12.4	18.3	1.80	1.88	1.68	0.000
	66-78	Bt2	0.0	0.0	0.1	14.0	34.3	48.4	27.3	24.3	30.8	12.0	18.8	1.77	1.84	1.68	0.000
SND [6]: (S87LA27-1)	0-5	Ap	0.2	0.2	0.1	4.1	28.0	32.6	60.1	7.3	22.9	3.9	19.0	---	---	---	---
	5-8	Eg1	0.2	0.1	0.1	4.1	26.9	31.4	60.8	7.8	20.3	3.9	16.4	---	---	---	---
	8-12	Eg2	0.7	0.4	0.1	3.8	25.5	30.5	62.2	7.3	18.4	3.6	14.8	---	---	---	---
	12-22	BE	0.9	0.4	0.1	3.8	24.6	28.9	62.4	7.8	18.5	3.5	15.0	---	---	---	---
	22-40	Btg	0.2	0.1	0.1	2.8	17.8	21.0	44.5	34.5	28.7	14.0	14.7	---	---	---	---
	40-52	Cg1	0.0	0.0	0.0	3.2	21.9	25.1	46.0	28.9	25.5	11.9	13.6	---	---	---	---
	52-60	Cg2	0.0	0.0	0.0	4.4	28.3	32.7	42.0	25.3	24.2	10.6	13.6	---	---	---	---

TABLE 19.--PHYSICAL TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (mm): Sand: Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Total (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Water content at tension: 1/3 bar	15 bar	WRD	Bulk density: Air-dry	Oven-dry	Field Moist.	COLE
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	g/cm^3	g/cm^3	g/cm^3	cm/cm
SND [7]:	0-5	Ap	0.2	0.3	0.1	0.4	3.1	4.1	84.8	11.1	28.1	5.2	22.9	---	---	---	---
(S87LA-27-2)	5-9	Eg	1.8	0.8	0.2	0.5	2.8	6.1	78.9	15.0	25.4	6.7	18.7	---	---	---	---
	9-17	BE	1.8	1.1	0.2	0.4	2.8	6.3	79.2	14.5	24.5	6.1	18.4	---	---	---	---
	17-24	Btg1	1.1	0.6	0.1	0.4	2.3	10.8	74.0	21.5	27.0	9.0	18.0	---	---	---	---
	24-44	Btg2	0.8	0.4	0.1	0.3	2.0	3.6	59.6	36.8	32.3	15.4	16.9	---	---	---	---
	44-50	Cg1	0.8	0.3	0.1	0.2	2.3	3.7	69.1	27.2	27.8	11.4	16.4	---	---	---	---
	50-60	Cg2	0.4	0.3	0.1	0.2	2.1	3.1	65.6	31.3	28.6	13.0	15.6	---	---	---	---

[1] Pedon is the typical pedon for the series in the survey area. Analyses by the characterization laboratory, Louisiana Agricultural Experiment Station.

[2] Pedon is closely similar to the Crowley series, but the clay content of the Btg2 horizon is 0.4 percent lower than allowed in the series range. This difference is within the normal error of observation.

[3] Pedon is a taxadjunct to the Gore series because it is a Hapludalfs rather than a Paleudalfs.

[4] Pedon is closely similar to the Midland series, but the COLE of the upper 20 inches of the B horizon is greater than defined for the series.

[5] Pedon is a taxadjunct to the Morey series because the family mineralogy is siliceous rather than mixed.

[6] SND - Series not determined. This pedon is mapped as an inclusion in map unit CrA, Crowley-Vidrine silt loams, 0 to 1 percent slopes. It classifies as fine-silty, mixed, thermic Typic Albaqualfs. The location of the pedon is about 2 miles northwest of Raymond, 340 feet from crossfence, 152 feet north of center of road, SE 1/4 SW 1/4, sec. 1, T. 8S., R. 4W. Analyses by the National Soil Survey Laboratory.

[7] SND - Series not determined. This pedon classifies as fine-silty, mixed, thermic Typic Albaqualfs. It is mapped as an inclusion in map unit, CrA, Crowley-Vidrine silt loams, 0 to 1 percent slopes. The location of the pedon is about 3 miles south of Elton, 382 feet east of intersection, 100 feet north of center of road, SW 1/4 SW 1/4, sec. 17, T. 7S., R. 3W. Analyses by the National Soil Survey Laboratory.

[8] This horizon was subdivided for sampling purposes.

TABLE 20.--CHEMICAL TEST DATA FOR SELECTED SOILS

(The symbol < means less than. Dashes indicate analyses not made)

Soil name and sample number	Depth	Horizon	Extractable bases Ca	Mg	K	Na	Extractable acidity	Cation-exchange capacity (NH_4OAc)	Base saturation (NH_4OAc)	Organic carbon	pH 1:1 H_2O	pH 1:1 KCl	pH 1:2 $CaCl_2$	Extractable iron	Extractable aluminum	Extractable hydrogen	Extractable phosphorus Bray 1	Bray 2
	In		--meq/100g--						Pct	Pct				Pct	--Meq/100g--		ppm	ppm
Acadia silt loam [1]:	0-6	Ap,E	2.0	0.5	0.0	0.0	8.4	4.2	59.5	0.57	5.0	4.8	4.2	0.9	0.4	0.4	8.0	8.0
(S87LA-53-2)	6-14	BE	2.3	1.4	0.2	0.2	8.4	8.0	51.3	0.16	4.9	4.0	4.3	0.8	3.4	0.2	5.0	5.0
	14-20	Bt	4.9	5.1	0.0	0.1	14.4	22.1	45.7	0.15	5.1	3.8	4.4	0.3	8.3	0.5	5.0	5.0
	20-31	Btg[8]	4.6	5.8	0.0	0.0	13.2	18.5	56.2	0.13	5.0	3.7	4.3	0.4	7.7	0.1	5.0	5.0
	31-41	Btg[8]	4.9	6.0	0.0	0.3	11.4	16.1	69.6	0.09	5.0	3.8	4.4	0.5	6.7	0.3	5.0	5.0
	41-48	BCg	6.2	7.1	0.0	0.3	9.6	16.6	81.9	0.00	5.1	3.8	4.5	0.6	3.9	0.1	5.0	5.0
	48-60	BC	8.6	9.5	0.0	1.1	7.2	18.5	103.8	0.00	5.2	3.8	4.6	0.7	1.8	1.0	5.0	5.0
	60-70	2BC1	7.0	7.2	0.0	1.2	4.8	17.8	86.5	0.00	5.4	3.9	4.7	0.9	1.1	0.5	5.0	5.0
	70-80	2BC2	6.7	6.5	0.0	0.0	4.2	14.7	89.8	0.00	5.4	4.0	4.8	0.9	0.5	0.5	5.0	5.0
Crowley silt loam [1,2]:	0-7	Ap1	2.5	0.6	0.1	0.1	6.1	6.4	52.0	1.12	5.6	4.5	4.9	0.24	0.2	0.1	250.0	310.0
(S83LA-53-1)	7-13	Ap2	3.5	0.6	0.1	0.1	3.6	5.8	74.0	0.36	6.0	4.4	5.0	0.23	0.1	0.1	5.0	13.0
	13-17	Eg	2.2	0.6	0.1	0.1	3.6	5.4	56.0	0.24	5.6	4.2	4.9	0.22	0.4	0.0	<5.0	8.0
	17-31	Btg1	6.3	3.7	0.2	0.8	14.0	21.1	52.0	0.38	5.4	3.6	4.5	1.04	4.5	0.1	<5.0	<5.0
	31-40	Btg2	7.5	4.3	0.2	0.8	9.0	19.3	66.0	0.28	5.5	3.8	4.8	1.11	2.5	0.2	<5.0	<5.0
	40-48	Btg3	10.0	5.0	0.2	1.2	7.2	17.2	95.0	0.12	5.6	3.9	5.0	0.81	0.8	0.5	<5.0	<5.0
	48-61	Btg4	10.0	5.7	0.2	1.2	5.0	17.3	99.0	0.08	6.1	4.2	5.3	0.68	0.0	0.3	<5.0	<5.0
	61-73	Btg5	11.3	6.3	0.2	1.0	4.3	18.0	100.0	0.02	6.3	4.5	5.6	0.46	0.0	0.3	<5.0	<5.0
Gore silt loam [1,3]:	0-4	A	3.5	2.5	0.0	0.0	10.8	10.2	58.8	1.49	6.0	4.2	5.1	0.5	---	---	5.0	5.0
	4-15	Bt	5.9	16.0	0.1	2.2	10.2	22.3	108.5	0.19	5.6	4.0	5.1	0.9	1.0	0.4	5.0	<5.0
	15-28	Bss1	8.9	13.6	0.1	4.9	3.6	22.6	121.7	0.13	6.4	5.3	6.2	0.7	---	---	5.0	5.0
	28-32	Bss2	9.5	19.0	0.1	5.1	2.4	26.6	126.7	0.12	7.1	5.8	6.9	0.7	---	---	18.0	20.0
	32-39	BCk1	11.9	13.6	0.0	3.6	0.6	21.0	138.6	0.08	8.0	6.3	7.1	0.9	---	---	<5.0	<5.0
	39-49	BCk2	20.9	11.2	0.0	2.6	0.6	17.5	198.3	0.00	8.5	6.7	7.3	0.6	---	---	<5.0	<5.0
	49-63	BCk3	23.8	7.1	0.0	1.6	0.0	10.8	300.9	0.00	8.6	6.9	7.4	0.4	---	---	8.0	8.0
	63-74	2C	11.9	4.4	0.0	2.3	0.0	6.4	290.6	0.00	9.0	7.0	7.6	0.5	---	---	54.0	80.0
Judice silty clay [1]:	0-9	Ap	20.7	7.9	0.3	0.8	9.6	29.5	100.7	1.30	6.0	5.3	5.6	1.7	---	---	28.0	32.0
(S87LA-53-4)	9-20	A	25.8	10.0	0.2	1.3	6.0	31.0	120.3	0.53	6.7	6.0	6.4	1.7	---	---	6.0	12.0
	20-29	Bssg1[8]	19.4	8.1	0.1	1.5	5.4	26.4	110.2	0.38	7.0	6.1	6.7	1.7	---	---	5.0	5.0
	29-40	Bssg1[8]	17.8	7.7	0.1	1.6	4.8	23.6	115.3	0.35	7.0	6.1	6.7	1.7	---	---	5.0	5.0
	40-49	Bssg2	17.1	7.3	0.1	1.4	5.4	21.2	122.2	0.29	7.2	6.0	6.7	1.7	---	---	5.0	5.0
	49-59	Bssg3	17.6	7.3	0.1	4.8	5.4	24.0	124.2	0.25	7.2	6.0	6.7	1.8	---	---	5.0	5.0
	59-70	Bssg4	20.0	8.1	0.2	1.7	6.6	24.5	122.4	0.06	7.0	6.0	6.7	1.8	---	---	8.0	12.0

TABLE 20.--CHEMICAL TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases Ca	Extractable bases Mg	Extractable bases K	Extractable bases Na	Ex-tractable acidity	Cation-exchange capacity (NH_4OAc)	Base saturation (NH_4OAc)	Organic carbon	pH 1:1 H_2O	pH 1:1 KCl	pH 1:2 $CaCl_2$	Ex-tractable iron	Ex-tractable aluminum	Ex-tractable hydrogen	Ex-tractable phosphorus Bray 1	Ex-tractable phosphorus Bray 2
	In		meq/100g						Pct	Pct				Pct	Meq/100g		ppm	ppm
Midland silt loam [1,4]:	0-6	Ap	8.9	3.6	0.0	0.0	4.8	12.5	100.0	0.60	6.3	5.3	6.0	1.1	---	---	52.0	60.0
(S87LA-53-3)	6-14	Btg1	14.3	6.1	0.0	0.5	3.6	19.0	110.0	0.47	6.8	5.6	6.5	1.0	---	---	5.0	5.0
	14-19	Btg2	18.2	9.4	0.0	0.6	4.2	26.5	106.4	0.21	6.9	5.7	6.7	1.0	---	---	5.0	5.0
	19-30	Btg3	17.5	9.1	0.0	1.3	3.6	24.0	116.3	0.18	7.0	5.8	6.7	1.2	---	---	5.0	5.0
	30-41	Btg4	17.6	8.8	0.0	0.5	2.4	23.0	117.0	0.15	7.2	5.9	6.8	1.2	---	---	5.0	5.0
	41-52	Btg5	25.0	8.7	0.0	0.4	0.6	23.0	148.3	0.10	7.3	6.2	6.8	1.3	---	---	5.0	5.0
	52-64	Btg6	17.0	8.5	0.0	0.3	1.8	21.5	120.0	0.00	7.5	6.3	7.1	1.4	---	---	5.0	5.0
	64-75	BCkg	25.7	8.8	0.1	1.0	2.4	27.0	131.9	0.00	7.6	6.4	7.1	1.5	---	---	5.0	5.0
Morey loam [1,5]:	0-6	Ap	4.3	1.1	0.2	0.6	5.4	5.5	112.7	0.58	6.1	4.7	5.3	5.4	---	---	20.0	28.0
(S87LA-53-5)	6-19	BA	10.1	2.9	0.1	1.4	4.8	12.2	118.9	0.40	6.6	5.3	6.0	4.8	---	---	5.0	5.0
	19-29	Btg1	11.9	3.6	0.1	1.6	6.0	15.0	114.7	0.21	6.3	5.1	5.8	6.0	---	---	5.0	5.0
	29-36	Btg2	13.2	4.0	0.1	1.5	5.4	16.0	117.5	0.15	6.3	5.2	6.0	5.4	---	---	5.0	5.0
	36-62	Btg3	14.0	4.3	0.1	1.4	4.8	17.5	113.1	0.13	6.4	5.3	6.1	4.8	---	---	5.0	5.0
	62-73	Btg4	16.6	5.1	0.1	1.6	5.4	17.0	137.6	0.00	6.5	5.4	6.2	5.4	---	---	5.0	5.0
	73-80	Btg5	16.2	4.9	0.1	1.1	4.2	18.3	121.9	0.00	6.6	5.4	6.2	4.2	---	---	5.0	5.0
Pineisland	0-9	Ap	2.2	1.0	0.1	0.1	4.8	6.9	49.3	0.76	5.9	4.2	4.8	0.6	0.2	0.2	22.0	31.0
loam [1]:	9-15	Ec	2.3	1.2	0.1	0.1	3.9	6.0	61.7	0.33	5.4	4.2	4.4	0.9	0.2	0.6	5.0	5.0
(S86LA-53-1)	15-24	E/B	1.1	1.2	0.1	0.1	6.6	6.6	37.9	0.24	4.7	4.2	4.5	1.3	2.2	0.2	5.0	5.0
	24-38	B/E	1.1	1.8	0.1	0.2	7.8	6.8	47.1	0.19	4.6	4.1	4.4	1.2	3.0	0.6	5.0	5.0
	38-48	Btx	1.0	2.0	0.1	0.1	7.8	9.2	34.8	0.15	4.7	4.0	4.4	1.1	3.4	0.6	5.0	5.0
	48-66	Bt1	2.4	3.2	0.1	0.1	7.8	9.0	64.4	0.12	4.8	3.8	4.5	1.2	1.8	0.6	5.0	5.0
	66-78	Bt2	3.5	4.4	0.1	0.2	4.8	11.6	70.7	0.10	4.9	3.8	4.7	1.1	1.3	0.3	5.0	5.0
SND [6]:	0-5	Ap	1.7	1.0	0.1	0.2	---	6.1	49.0	1.28	5.3	---	---	---	---	3.6	---	---
(S57LA-27-1)	5-8	Eg1	1.8	1.0	0.0	0.2	---	5.2	58.0	0.76	5.7	---	---	---	---	4.9	---	---
	8-12	Eg2	1.8	1.1	0.0	0.2	---	4.4	70.0	0.35	6.0	---	---	---	---	1.2	---	---
	12-22	BE	0.9	0.8	0.0	0.2	---	4.1	46.0	0.28	5.4	---	---	---	---	2.8	---	---
	22-40	Btg	3.7	3.3	0.2	0.9	---	16.4	49.0	0.29	5.0	---	---	---	---	9.4	---	---
	40-52	Cg1	4.8	4.2	0.2	0.9	---	14.2	71.0	0.08	5.2	---	---	---	---	4.5	---	---
	52-60	Cg2	6.1	5.2	0.2	1.0	---	14.1	89.0	0.02	5.9	---	---	---	---	2.9	---	---

TABLE 20.--CHEMICAL TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases Ca	Mg	K	Na	Ex-tract-able acidity	Cation-exchange capacity (NH_4OAc)	Base saturation (NH_4OAc)	Organic carbon	pH 1:1 H_2O	1:1 KCl	1:2 $CaCl_2$	Ex-tract-able iron	Ex-tract-able aluminum	Ex-tract-able hydrogen	Extractable phosphorus Bray 1	Bray 2
	In		meq/100g						Pct	Pct				Pct	Meq/100g		ppm	ppm
SND[7]:	0-5	Ap	2.0	1.0	0.2	0.2	---	7.2	47.0	1.06	5.1	---	---	---	---	4.5	---	---
	5-9	Eg	3.8	1.6	0.1	0.2	---	8.0	71.0	0.49	6.3	---	---	---	---	2.8	---	---
	9-17	BE	1.6	1.1	0.0	0.2	---	6.6	44.0	0.26	5.1	---	---	---	---	3.6	---	---
	17-24	Btg1	1.7	1.5	0.1	0.4	---	9.6	38.0	0.29	5.2	---	---	---	---	5.3	---	---
	24-44	Btg2	4.4	3.8	0.2	0.9	---	17.0	55.0	0.42	5.4	---	---	---	---	9.0	---	---
	44-50	Cg1	5.2	4.4	0.2	0.8	---	13.5	78.0	0.09	5.5	---	---	---	---	3.3	---	---
	50-60	Cg2	6.8	5.6	0.2	0.9	---	15.3	88.0	0.05	5.7	---	---	---	---	2.5	---	---

[1] Pedon is the typical pedon for the series in the survey area. Analyses by the characterization laboratory, Louisiana Agricultural Experiment Station.

[2] Pedon is closely similar to the Crowley series, but the clay content of the Btg2 horizon is 0.4 percent lower than allowed in the series range. This difference is within the normal error of observation.

[3] Pedon is a taxadjunct to the Gore series because it is a Hapludalf rather than a Paleudalf.

[4] Pedon is closely similar to the Midland series, but the COLE of the upper 20 inches of the B horizon is greater than defined for the series.

[5] Pedon is a taxadjunct to the Morey series because the family mineralogy is siliceous rather than mixed.

[6] SND - Series not determined. This pedon is mapped as an inclusion in map unit CrA, Crowley-Vidrine silt loams, 0 to 1 percent slopes. It classifies as fine-silty, mixed, thermic Typic Albaqualfs. The location of the pedon is about 2 miles northwest of Raymond, 340 feet from crossfence, 152 feet north of center of road; SE 1/4 SW 1/4, sec. 1, T. 8S., R. 4W. Analyses by the National Soil Survey Laboratory.

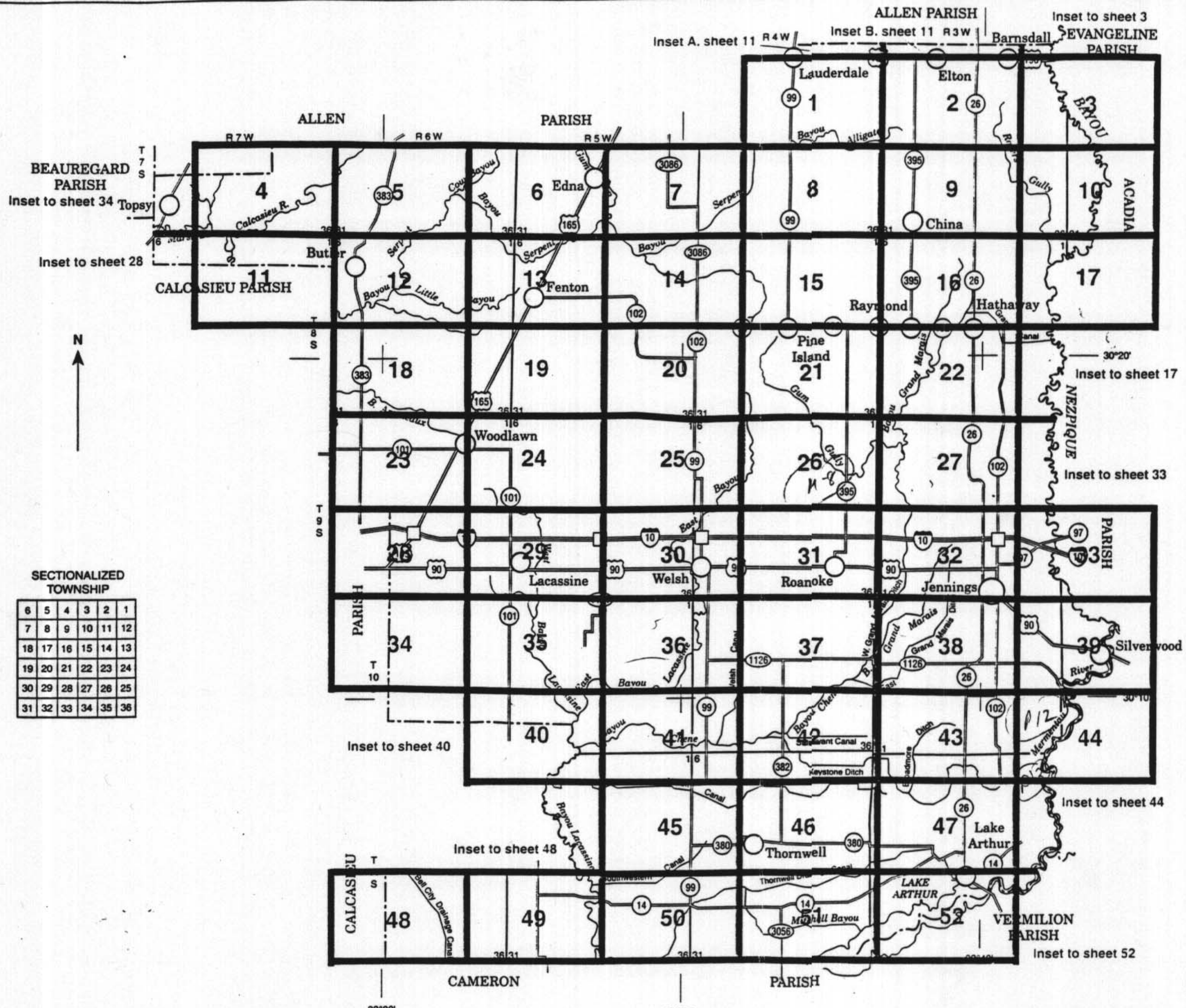
[7] SND - Series not determined. This pedon classifies as fine-silty, mixed, thermic Typic Albaqualfs. It is mapped as an inclusion in map unit, CrA, Crowley-Vidrine silt loams, 0 to 1 percent slopes. The location of the pedon is about 3 miles south of Elton, 382 feet east of intersection, 100 feet north of center of road, SW 1/4 SW 1/4, sec. 17, T. 7S., R. 3W. Analyses by the National Soil Survey Laboratory.

[8] This horizon was subdivided for sampling purposes.

TABLE 21.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Acadia	Fine, montmorillonitic, thermic Aeric Ochraqualfs
Allemands	Clayey, montmorillonitic, euic, thermic Terric Medisaprists
Arat	Fine-silty, siliceous, nonacid, thermic Typic Hydraquents
Barbary	Very-fine, montmorillonitic, nonacid, thermic Typic Hydraquents
Basile	Fine-silty, mixed, thermic Typic Glossaqualfs
Bienville	Sandy, siliceous, thermic Psammentic Paleudalfs
Caddo	Fine-silty, siliceous, thermic Typic Glossaqualfs
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
*Cascilla	Fine-silty, mixed, thermic Fluventic Dystrochrepts
Crowley	Fine, montmorillonitic, thermic Typic Albaqualfs
Ged	Very-fine, mixed, thermic Typic Ochraqualfs
Glenmora	Fine-silty, siliceous, thermic Glossaquic Paleudalfs
*Gore	Fine, mixed, thermic Vertic Paleudalfs
Guyton	Fine-silty, siliceous, thermic Typic Glossaqualfs
Judice	Fine, montmorillonitic, thermic Vertic Haplaquolls
Kaplan	Fine, mixed, thermic Aeric Ochraqualfs
Kinder	Fine-silty, siliceous, thermic Typic Glossaqualfs
Leton	Fine-silty, mixed, thermic Typic Glossaqualfs
Messer	Coarse-silty, siliceous, thermic Haplic Glossudalfs
Midland	Fine, montmorillonitic, thermic Typic Ochraqualfs
*Morey	Fine-silty, mixed, thermic Typic Argiaquolls
Mowata	Fine, montmorillonitic, thermic Typic Glossaqualfs
Pineisland	Fine-silty, siliceous, thermic Glossic Fragiudalfs
Vidrine	Coarse-silty over clayey, mixed, thermic Glossaquic Hapludalfs



6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

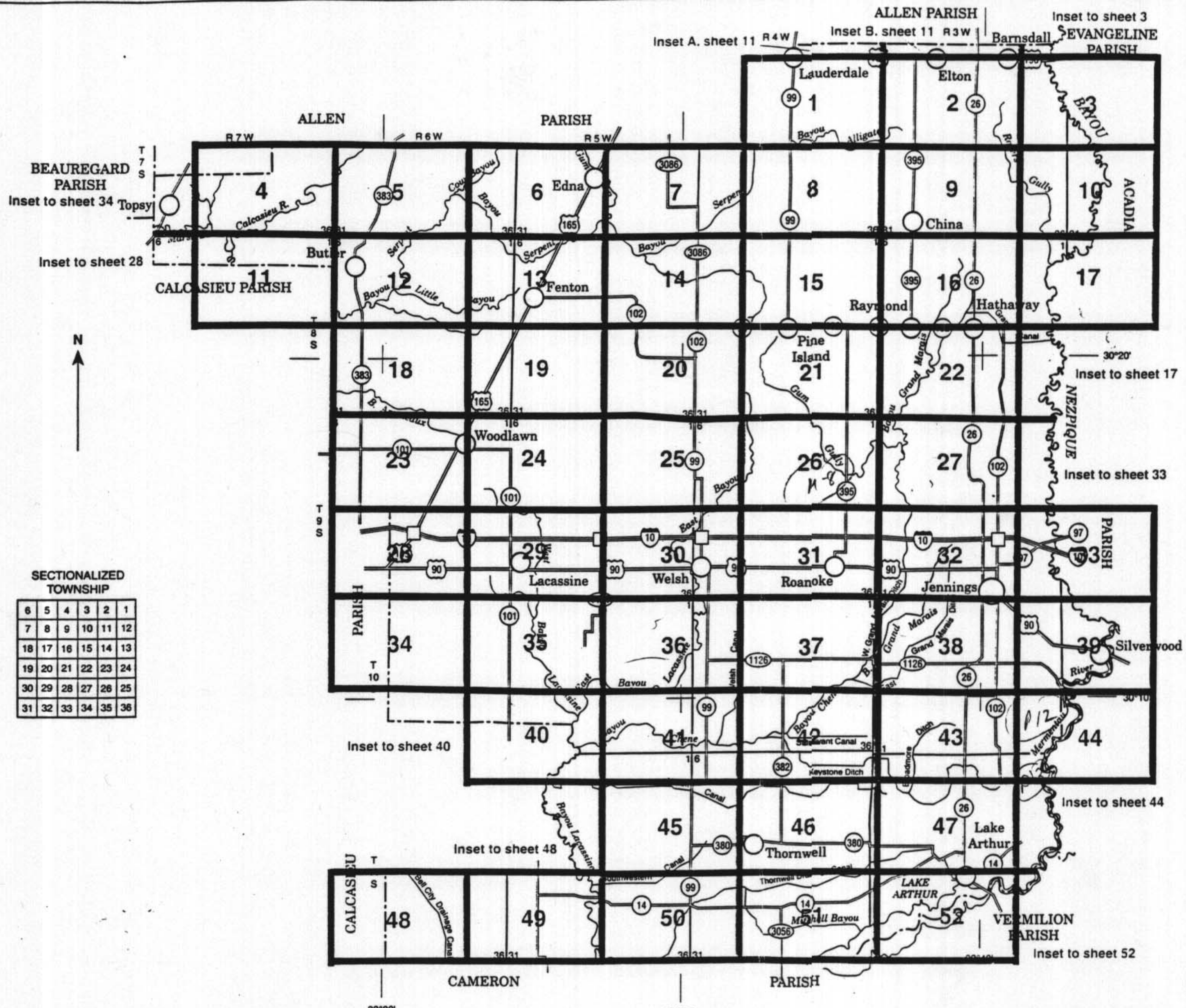
INDEX TO MAP SHEETS

JEFFERSON DAVIS PARISH, LOUISIANA

Scale 1 : 253,440

1 0 1 2 3 4 Miles

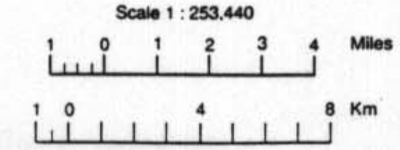
1 0 4 8 Km



INDEX TO MAP SHEETS

JEFFERSON DAVIS PARISH, LOUISIANA

Scale 1 : 253,440



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

JEFFERSON DAVIS PARISH, LOUISIANA — SHEET NUMBER 2

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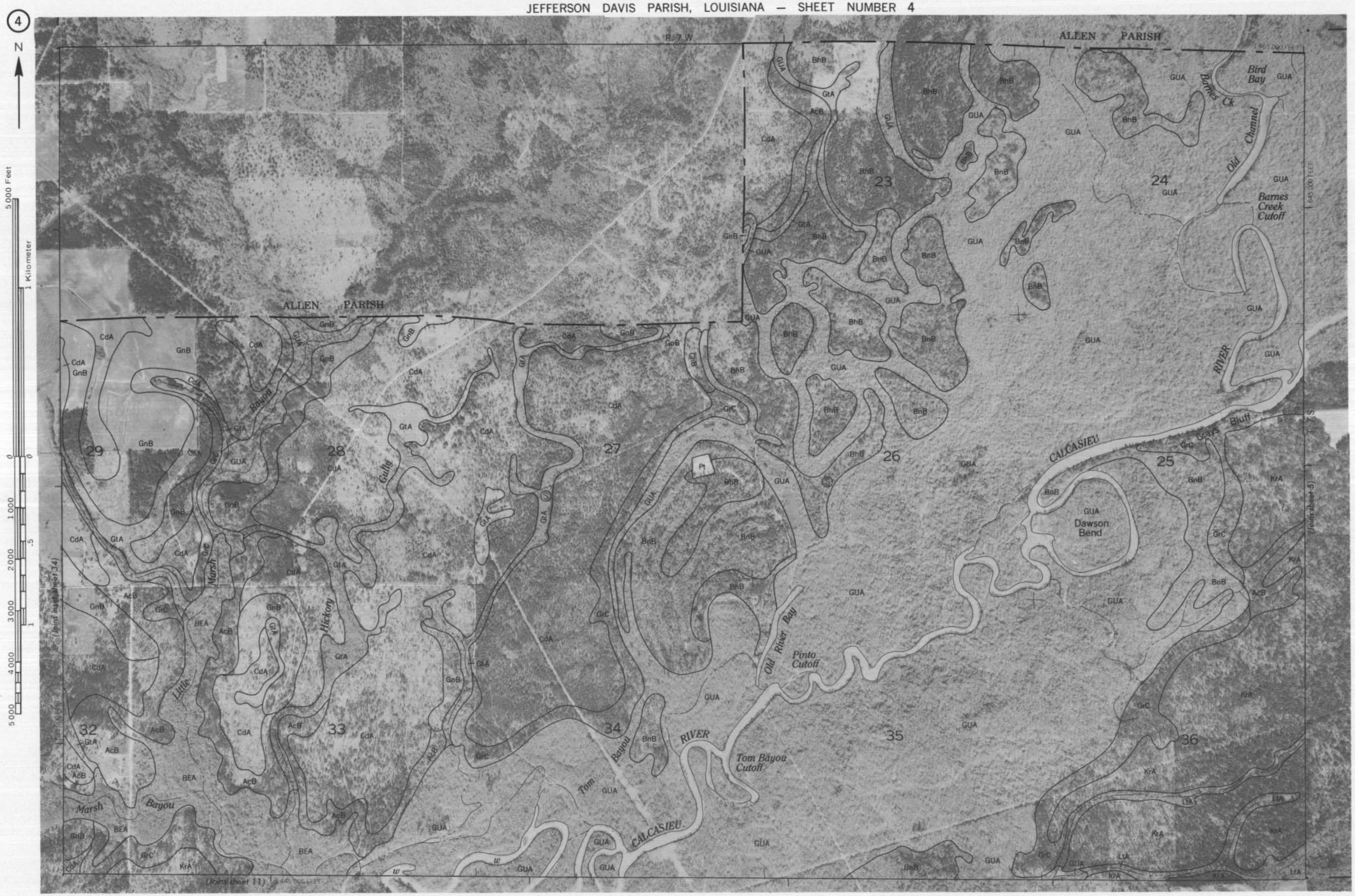

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1980 aerial photography. Coordinate grid ticks and land division corners, if sh... re ap... ately ... ioned

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JEFFERSON DAVIS PARISH, LOUISIANA — SHEET NUMBER 10

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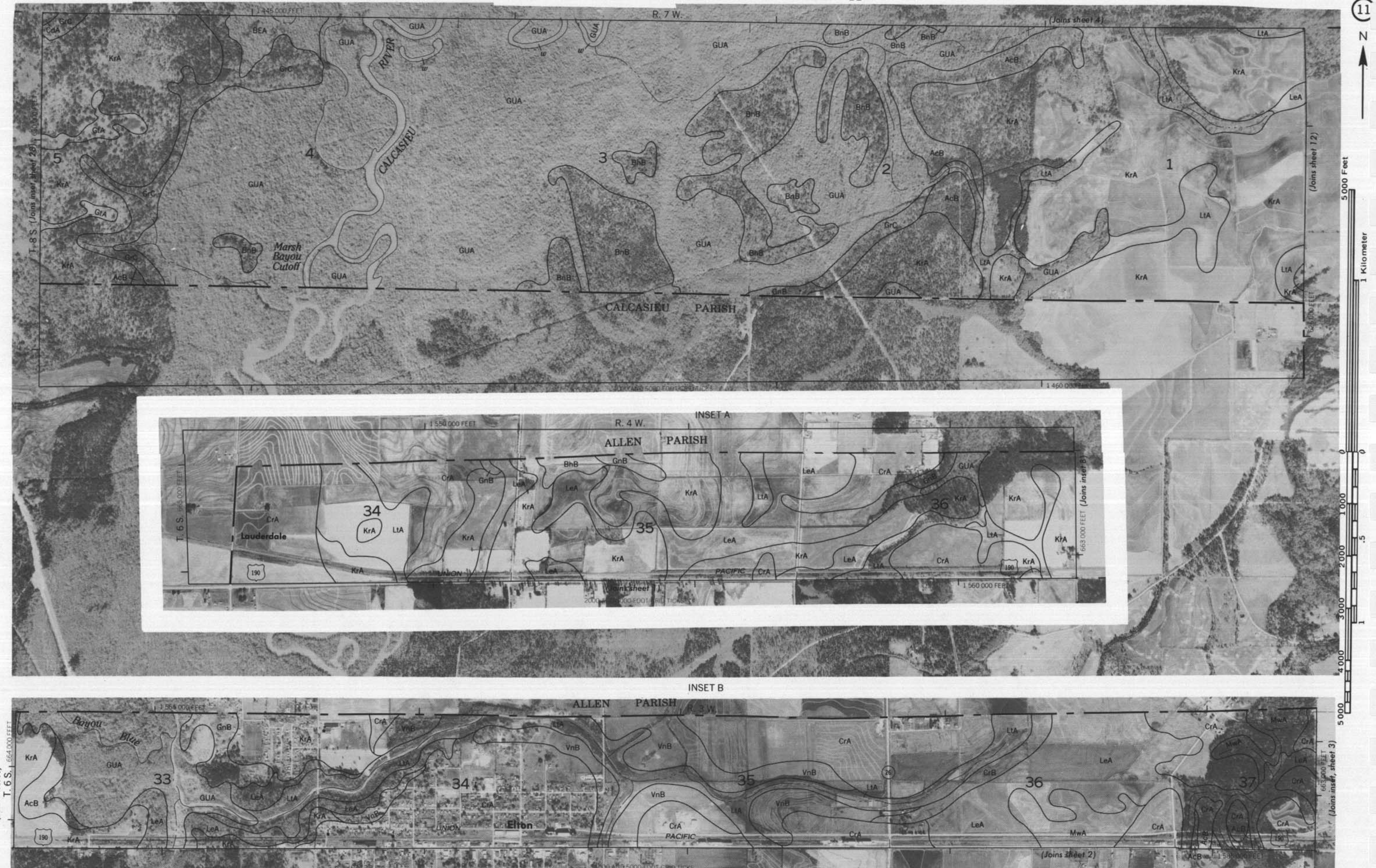

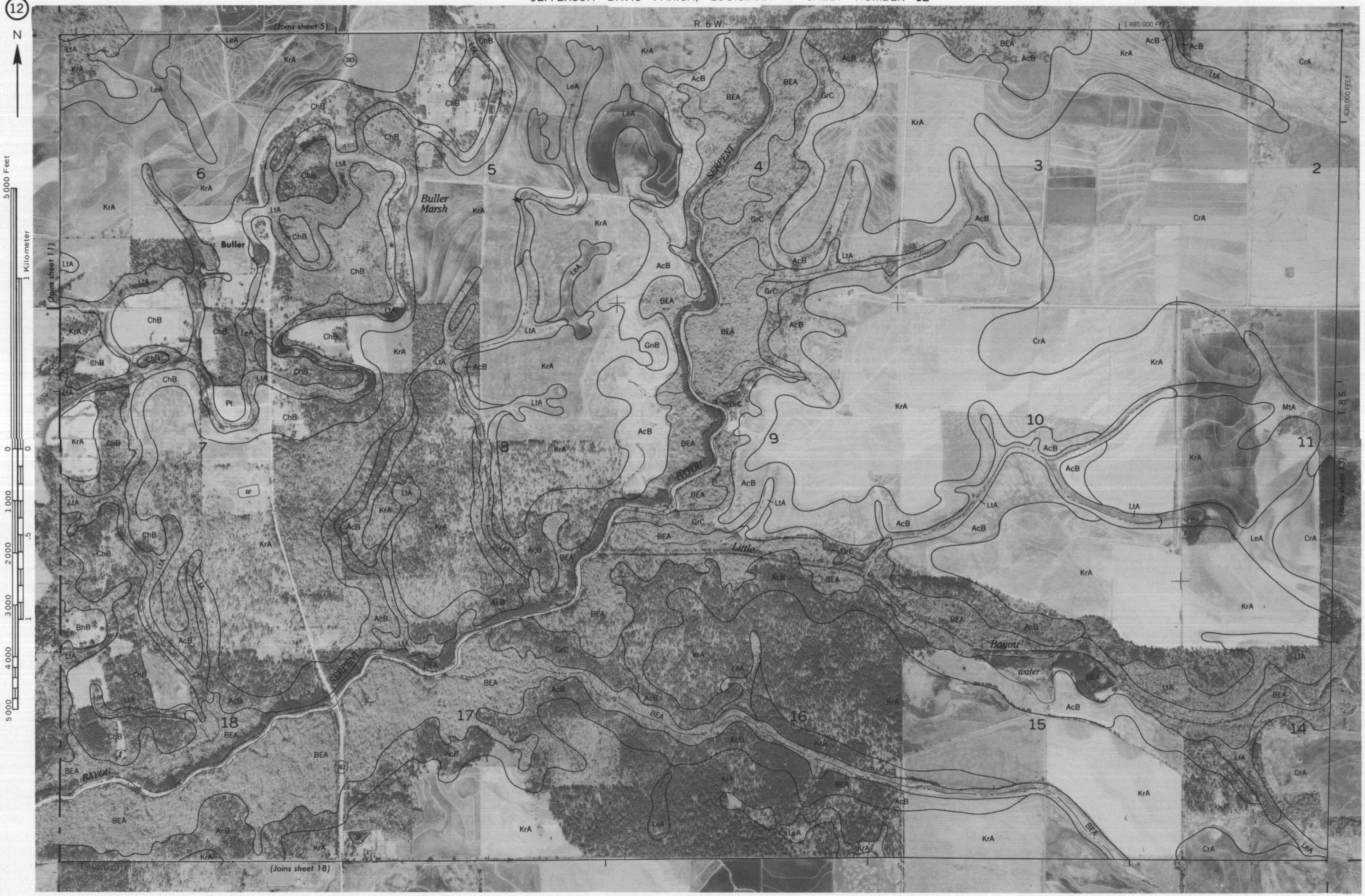

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JEFFERSON DAVIS PARISH, LOUISIANA — SHEET NUMBER 14

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JEFFERSON DAVIS PARISH, LOUISIANA — SHEET NUMBER 23

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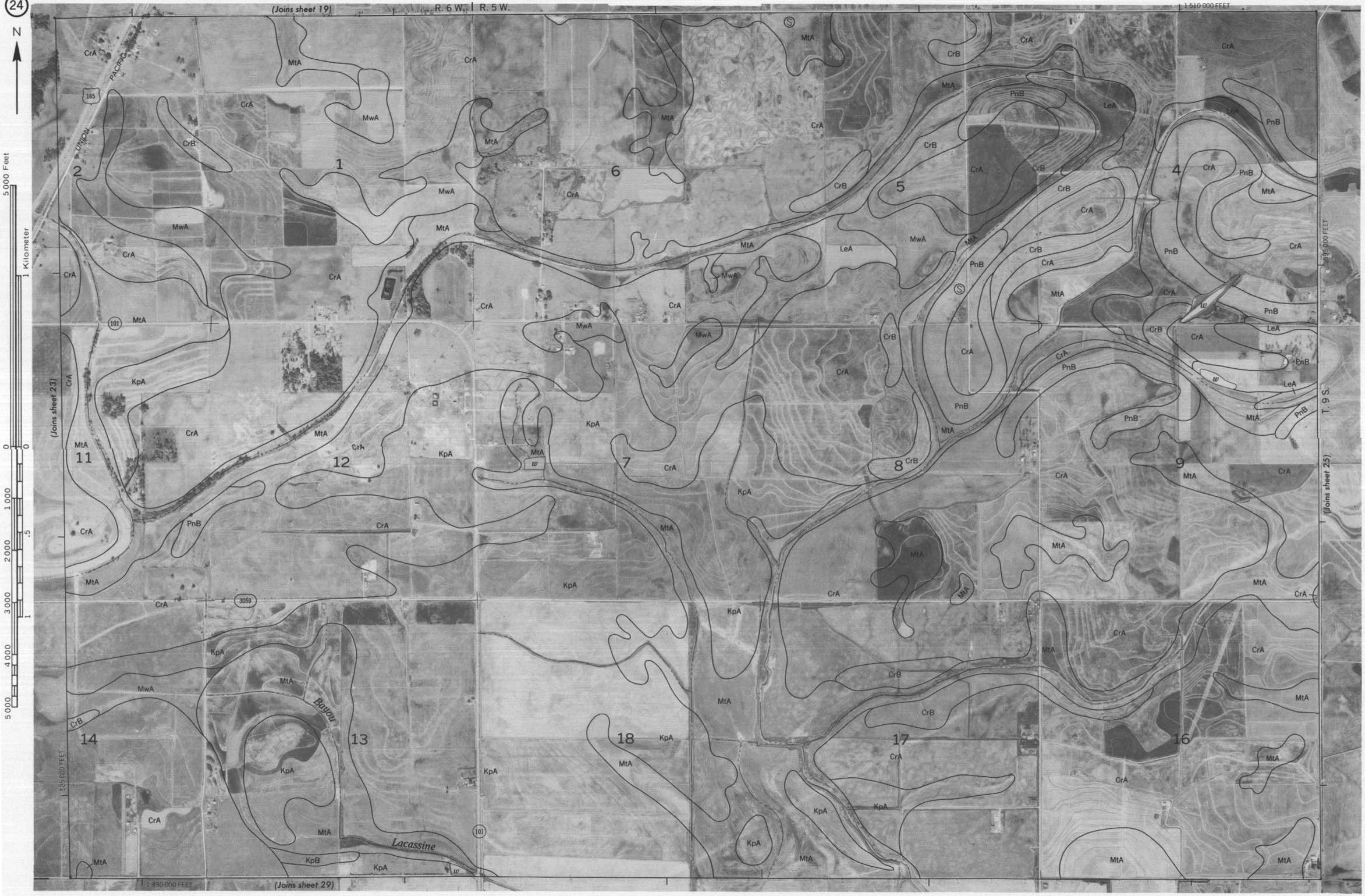
JEFFERSON DAVIS PARISH, LOUISIANA — SHEET NUMBER 24



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JEFFERSON DAVIS PARISH, LOUISIANA — SHEET NUMBER 25

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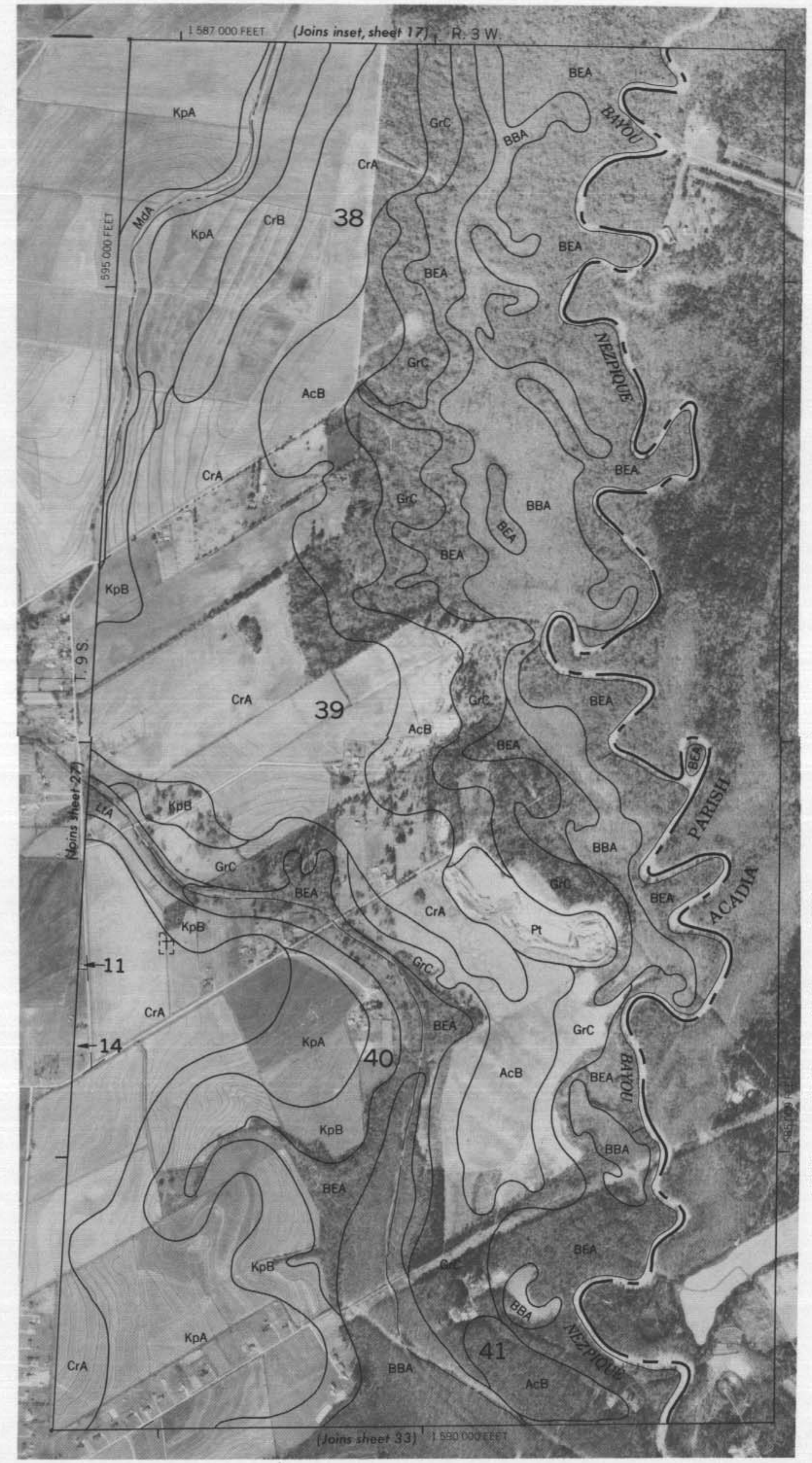

3000 AND 5000-FOOT GRID TICKS

JEFFERSON DAVIS PARISH, LOUISIANA — SHEET NUMBER 34

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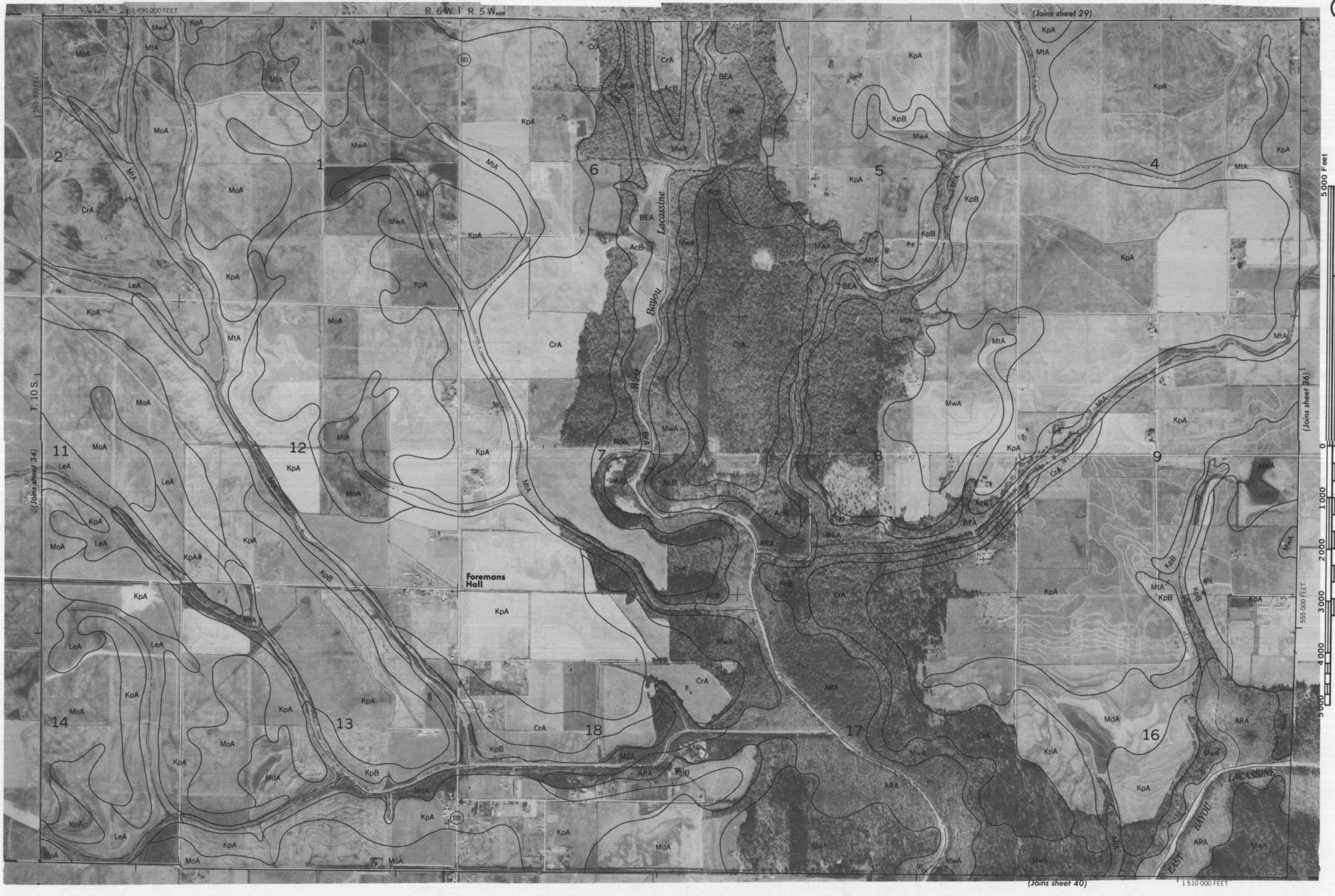

JEFFERSON DAVIS PARISH, LOUISIANA — SHEET NUMBER 36

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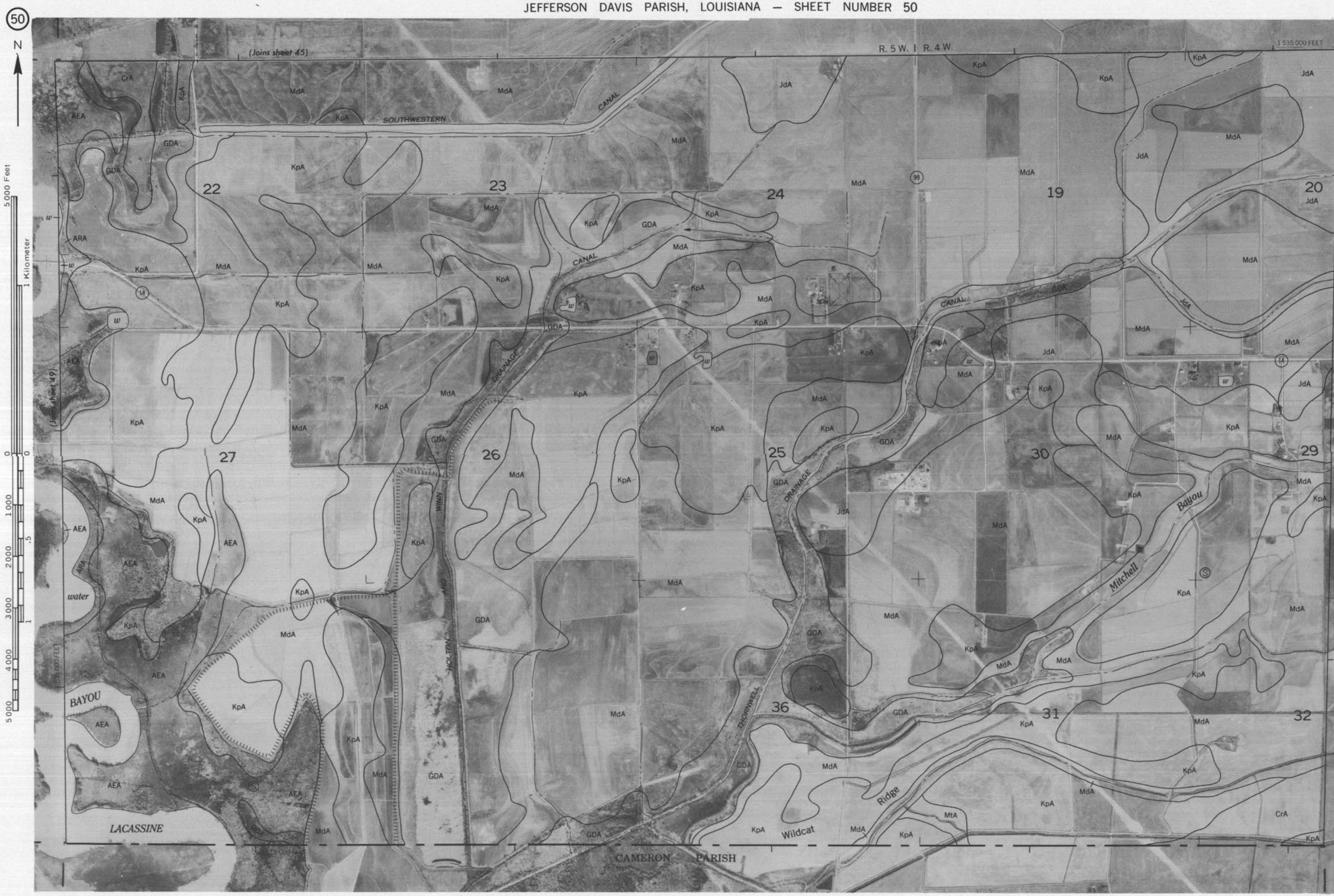

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