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**SOIL SURVEY OF**

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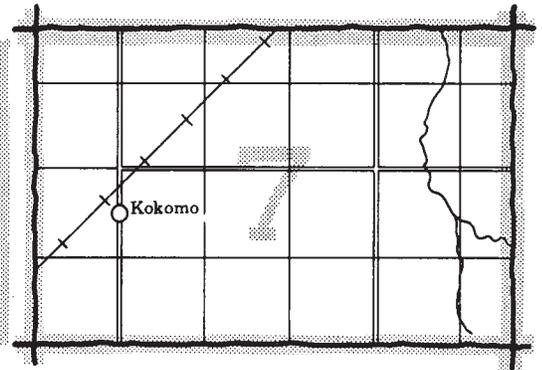
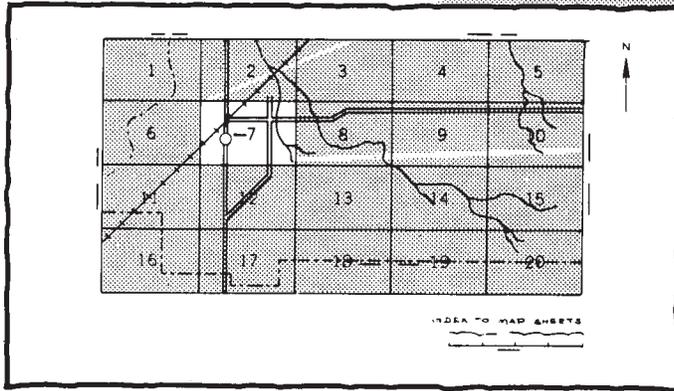
**Assumption Parish  
Louisiana**



***United States Department of Agriculture  
Soil Conservation Service  
in cooperation with  
Louisiana Agricultural Experiment Station***

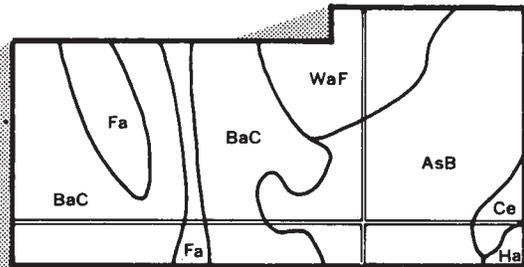
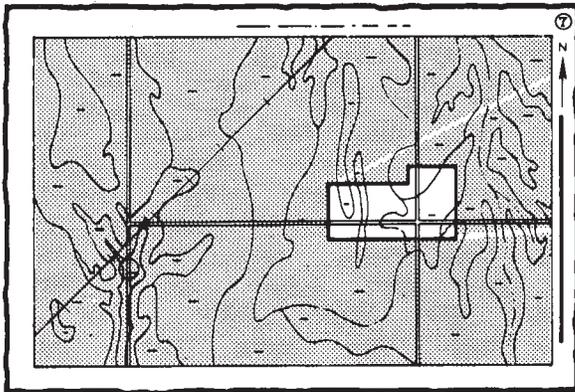
# HOW TO USE

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

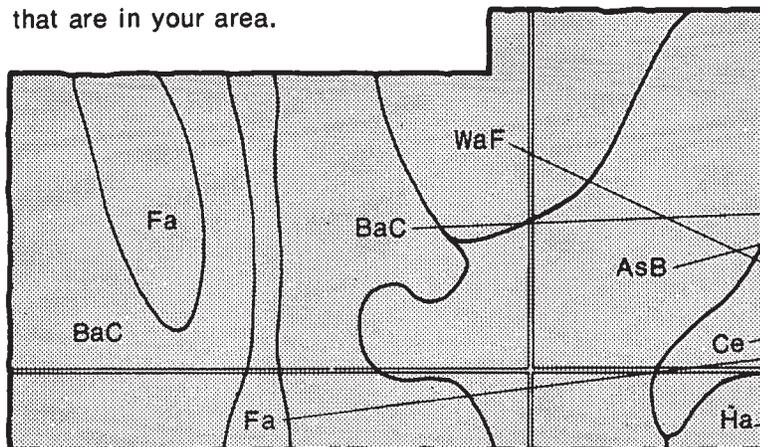


2. Note the number of the map sheet and turn to that sheet.

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



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

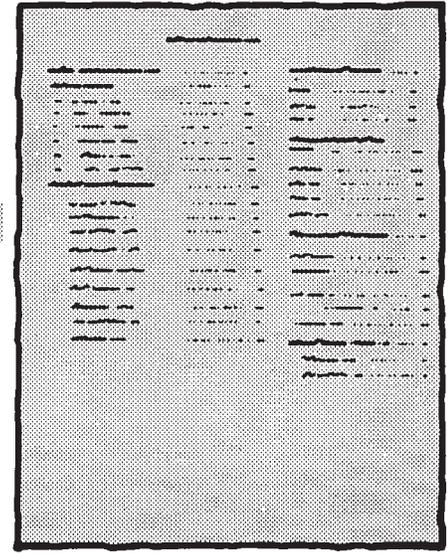
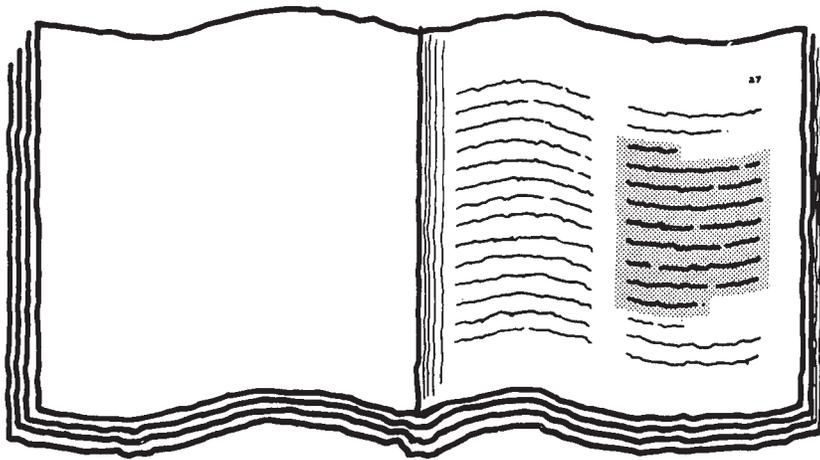


## Symbols

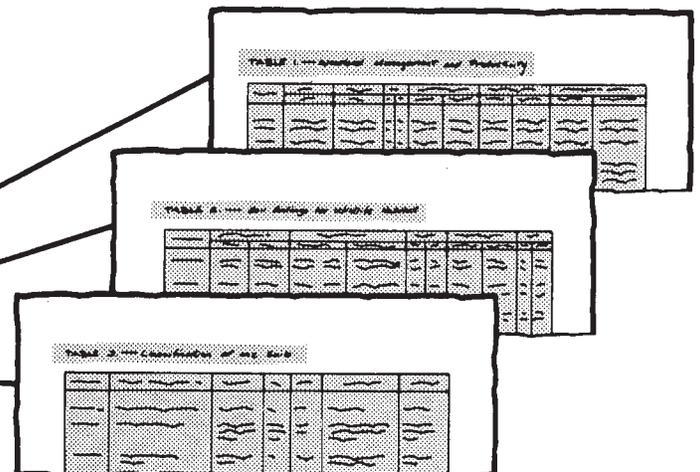
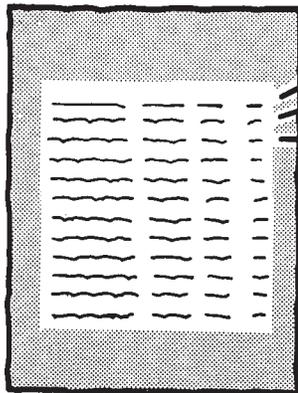
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# THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was completed in the period 1974-76. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service and the Louisiana Agricultural Experiment Station. It is part of the technical assistance furnished to the Lower Delta Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

**Cover: Lake Verret, the largest body of surface water in the parish, covers about 15,000 acres. Fishing is good to excellent for both game and commercial species.**

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## Foreword

The Soil Survey of Assumption Parish contains much information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

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

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.



Alton Mangum  
State Conservationist  
Soil Conservation Service



**Location of Assumption Parish in Louisiana.**

# SOIL SURVEY OF ASSUMPTION PARISH, LOUISIANA

By Dayton Matthews

*Fieldwork by Dayton Matthews, Ray E. Dance,  
and Gail L. Bowden, Soil Conservation Service*

*United States Department of Agriculture, Soil Conservation Service,  
in cooperation with the Louisiana Agricultural Experiment Station*

ASSUMPTION PARISH is in the south-central portion of Louisiana (see map on facing page). It is about 30 miles south of Baton Rouge and 60 miles west of New Orleans. The southern tip of the parish is about 25 miles from the Gulf of Mexico. Assumption Parish is bordered on the north by Iberville and Ascension Parishes, on the east by St. James and Lafourche Parishes, on the south by Terrebonne and St. Mary Parishes, and on the west by St. Martin and Iberia Parishes. Elevations range from 23 feet above sea level along the high natural levee of Bayou Lafourche near Donaldsonville to near sea level in the swamps south of Lake Verret. The total area of the parish is 236,962 acres, of which 21,654 acres is water. The total land area of the parish, including areas of water less than 40 acres in size, is 222,242 acres. The population of Assumption Parish in 1970 was 19,654.

Assumption Parish lies entirely within the Mississippi River alluvial plain but does not touch the present channel of the Mississippi River. The soils formed in sediment deposited by the Mississippi and Atchafalaya Rivers and their distributaries. There are two main physiographic surfaces—the natural levees and the backswamps. Loamy soils are dominant on the natural levees, and clayey soils are dominant on the backswamp areas. Flood protection for the parish is provided by the Mississippi River levee system and by the East Atchafalaya Basin protective levee. Many thousands of acres are flooded, however, because of their low elevation and lack of adequate outlets.

Almost all flooded soils are in woodland. Most soils not subject to flooding are in cropland. A very small acreage is used for industrial sites and as pastureland. The fertile, loamy, nearly level soils on the natural levees of Bayou Lafourche and the smaller bayous are choice sites for cropland. Sugarcane is the main crop. Assumption Parish is one of the most important sugar-producing parishes in the State.

## General nature of the parish

In this section general information concerning the parish is given. Agriculture, climate, Bayou Lafourche, transportation, water resources, minerals, industry, and history and development are discussed.

## Agriculture

Assumption Parish has always been an agricultural parish, even during Indian habitation. Probably the first white men to come to the region were trappers and traders, but farmers soon followed. Cotton, corn, maize, and sweet potatoes were grown on the loamy soils on the natural levees before 1700. The culture of indigo was important for only a short time. Cotton was the main crop for many years. Gradually the acreage decreased until 1890, when only 123 acres were planted. No cotton has been planted in recent years.

Increased production of sugarcane was the chief reason for the decline in the cotton crop. Production became important after successful sugar granulation procedures were developed in 1794. A few sugarcane plantations were established as early as 1803, but it was not until 1861 that sugarcane became the principal crop grown in the parish. Since then, most soils in the parish not subject to flooding have been used for the production of sugarcane. In recent years sugarcane acreage has been influenced by government quota. In 1976, 38,754 acres of sugarcane were planted in the parish. The 1975 yield average was 23.6 tons per acre. The loamy soils of the parish are well suited to the production of truck and vegetable crops, but at present commercial crops are not produced extensively. Many home gardens are along Bayou Lafourche.

The trend in agriculture is toward gradual reduction in the number of farm units, with the total acreage in crops remaining about the same.

In 1969 the value of farm products was 7,813,000 dollars, of which 99.2 percent was from crops, mostly sugarcane, and 0.8 percent was from livestock, poultry, and

dairy operations. Income from forest products has declined to less than 0.1 percent of the total value.

## Climate

By DR. ROBERT A. MULLER, Department of Geology and Anthropology, Louisiana State University.

Assumption Parish is part of a broad region of the southeastern United States that has a humid subtropical climate. The parish is dominated by warm, moist, maritime tropical air from the nearby Gulf of Mexico. This maritime tropical air is displaced frequently during winter and spring by incursions of continental polar air from Canada; these polar outbreaks usually persist no longer than 3 to 4 days. The incursions of cold air occur less frequently in autumn and only rarely in summer.

Usually there is a sharp contrast of weather on either side of the frontal boundary separating polar and tropical air. Following passage of a cold front in winter, the sky is typically covered by low clouds driven by strong, gusty northerly winds; temperatures fall into the forties; and intermittent drizzle falls. Within 24 hours, the sky generally clears, the wind abates, and overnight temperature may fall low enough to produce frost or freeze conditions. Balmy conditions remain to the south of the cold front where the air is tropical. In January, air temperatures reach the upper sixties to mid seventies, and sunshine is interrupted by billowy cumulus clouds swept toward the north within the moisture-laden air off the Gulf. Table 1 shows the annual regime of mean daily maximum and minimum temperatures by months, and examples of extreme conditions which have been experienced 2 years in 10, on the average, at Donaldsonville in Ascension Parish several miles north of the boundary of Assumption Parish.

These temperature data are based on 30 years of record, the standard climatological period, between 1941 and 1970, measured at Donaldsonville within a standard weather shelter. Temperatures near the top of a dense stand of crops or vegetation are somewhat higher during sunny days, and lower during clear, calm nights. Some small temperature variation is caused by slope, drainage, and proximity to local bodies of water.

Precipitation is generally associated with the passage of warm and cold fronts over the parish. Heavy showers with high-intensity rainfall, commonly lasting no more than an hour or 2, occur within vigorous squall lines ahead of cold fronts in winter and spring. Rainfall of 12- to 24-hour duration is uncommon. In summer, precipitation generally occurs as brief, heavy showers and thunderstorms between noon and early evening. Because each shower covers a very small area, a wide range of soil moisture conditions in summer and autumn often results. Heavy showers and more general rains occasionally occur late in summer and in autumn with the passage of tropical disturbances and hurricanes from the Gulf. Monthly precipitation data at Donaldsonville are given in table 1.

The climate of Assumption Parish is outstanding for crops suited to subtropical climate and local drainage conditions. It averages ample sunshine, warm but not excessive temperature, a long frost-free season, abundant precipitation, no significant snowfall, high atmospheric humidity, and infrequent damaging wind. Climatic hazards that can be especially damaging are mostly infrequent extreme events. The most serious hazards are briefly discussed in the following paragraphs.

Table 2 shows probability estimates of dates for the last low temperature in spring and the first low temperature in autumn for Donaldsonville. The table shows, for example, that the latest official 32-degree temperature occurs no later than February 24 every other year on the average, but that in about 1 year in 10, a freezing temperature can be expected as late as March 25. During the 30-year period, extremely low temperatures damaging to subtropical crops and vegetation have occurred; at Donaldsonville the absolute minimum was 10 degrees. These bitter polar outbreaks are mostly rare. For the 30-year period between 1941 and 1970 at nearby Baton Rouge, for example, daily minimum temperatures fell to 16 degrees or below only 12 times, 8 of which were during the very cold winters of 1962 through 1966 (4).

Rainstorms which produce local flooding and excessive soil moisture conditions take place occasionally. At nearby Baton Rouge, the maximum daily rainfall of record is almost 12 inches, and a daily rainfall of 5 inches or more can be expected about once every 5 years. These rainfalls often occur along stationary fronts in winter and spring or are associated with tropical disturbances in fall.

Despite the high average rainfall, monthly and seasonal variation of precipitation is great enough to result in short-term droughts and wet spells which affect agricultural operations and crop yields. The water-budget methodology is a useful systems framework for organization and inventory of relationships among climate, land use, and agriculture. Figure 1 is a graphical representation of some of the water-budget components calculated on a monthly basis from data taken at Ryan Airport in Baton Rouge, about 40 miles north of the center of Assumption Parish; the data for Baton Rouge are reasonably representative of water-balance components in Assumption Parish.

The potential evapotranspiration (PE), represented by the upper continuous curve on the graph, is defined as the maximum amount of evapotranspiration that would take place with a continuous plant cover and no shortage of soil moisture. The monthly estimates of PE are dependent on energy supply to the interface, particularly solar radiation. In the Thornthwaite system utilized in this analysis, these estimates are based principally on air temperature and day length. The seasonal regime of PE is low in winter and high in summer with relatively little variation from one year to the next.

The evapotranspiration (AE) represents calculated estimates of evaporation and transpiration together; AE, therefore, is an index of water use and biomass produc-

tion. Monthly AE cannot be greater than PE, but when AE is less than PE, the graph shows the moisture deficit (D), which is an index of water shortage or irrigation needed to maximize biomass production. The calculations assume that a 6-inch moisture storage capacity is available to the vegetation within the root zone. The deficits are greater if young plant roots are shallow, and smaller if roots are deep. Deficits are smaller in poorly drained backswamp areas.

The graph also shows the moisture surplus (S), which represents precipitation not utilized for evapotranspiration or soil moisture recharge. This surplus becomes either surface runoff or ground water recharge. It is strongly seasonal and is greatest in winter and spring. It occurs only occasionally in summer and fall—and a very large month by month variation is evident. Figure 1 also illustrates the tendency of wet or dry months, seasons, or years to cluster. This variability and clustering has considerable impact on agricultural activities. The large surpluses during 1961 were followed by the large deficits during 1962 and the first half of 1963.

Figure 2 shows monthly deficits and surpluses summed on a seasonal basis for the standard 30-year climatic period for Donaldsonville. Surpluses can be expected each winter and spring and occasionally in fall, but only rarely in summer. Deficits, on the other hand, should be expected each summer and fall in most years, but only occasionally in spring. As in figure 1, this figure illustrates the variability by seasons through the years, and the tendency to cluster. For example, winter surpluses were smaller than average during the late forties and the late sixties, spring surpluses were large during the late forties, and summer deficits were large during much of the forties and the late sixties (?).

Extremely severe weather conditions associated with thunderstorms, squall lines, and hurricanes occasionally occur, but the frequency of serious damage at any one location within the parish is very small. Hail and tornadoes occur very infrequently during severe thunderstorms. Tropical storms and hurricanes can be expected about 3 years in 10. They take place late in summer and in autumn and generally bring cloudy, windy, rainy weather. A severe hurricane causing widespread wind damage will probably recur only once in two or three decades; most recent was Hurricane Betsy in 1965.

## Bayou Lafourche

Bayou Lafourche is an important Mississippi River tributary that flows southward through the parish from Donaldsonville. It is the most significant physiographic feature of Assumption Parish. Its wide natural levees indicate that it at one time served as a major course of the Mississippi River. These natural levees are at the highest elevations in this parish. The bayou is 107 miles long from Donaldsonville to its mouth and was the source of most of the sediment in which the soils of the parish formed. Bayou Lafourche at one time had a manmade levee

system to prevent flooding from the Mississippi River, but in 1903 a dam was constructed across the bayou at Donaldsonville to seal it from the waters of the Mississippi River. The manmade levee system has been almost completely destroyed since it is no longer needed to guard against flooding from the Mississippi River. Pumps are located at the dam to pump sufficient water from the Mississippi River into the bayou for domestic and industrial uses along the bayou.

The road along the western bank of Bayou Lafourche (Louisiana Highway 1) has been described as the longest street in the world. A large number of houses are built close to each other almost the entire 107-mile length of the bayou.

## Transportation

*Highways.* State Highway 1 is a paved road crossing the north-south length of Assumption Parish on the west bank of Bayou Lafourche. On the opposite bank is State Highway 308, a hard surfaced road that also crosses the parish. Four other hard surfaced roads stem west and southwest from State Highway 1. About 4 miles of U.S. Highway 90, the only Federal highway in the parish, passes through the extreme southern part of the parish. Of approximately 150 miles of highways in the parish, about 25 are paved with concrete. The rest are bituminous.

*Railroads.* Two railroads serve the parish. One line has a freight service branch from Shriever, Louisiana, extending north on the west side of Bayou Lafourche through Napoleonville. Another also has a freight service branch that extends south from Donaldsonville along the west bank to Napoleonville and then east to Thibodaux.

*Navigable waterways.* Bayou Lafourche runs the length of the parish but is not navigable within the parish. However, it does transport fresh water from the Mississippi River for domestic and industrial use. The Intracoastal Waterway is linked with many navigable bayous and rivers on the west side of the parish.

*Pipelines.* Seven oil companies have lines into or through the parish. These lines supply natural gas and oil to many complexes in Louisiana and to other states in the northern and eastern United States.

*Airports.* Assumption Parish has several landing strips for small aircraft but no commercial air station.

## Water resources

*Surface Water.* Assumption Parish has 21,820 acres of surface water. Lake Verret makes up most of this acreage. There are 239 miles of rivers and bayous. Rainfall averages 60.3 inches annually, and runoff is estimated to be about 22 inches annually. There are many canals, ditches, and interconnected tidal streams. The principal stream is Bayou Lafourche, which carries fresh water pumped from the Mississippi River at Donaldsonville to supply some commercial and residential areas of the parish.

*Ground Water.* Fresh ground water is available in large quantities in much of Assumption Parish, although treatment is required for many uses. In parts of the parish, only slightly saline water is available in large quantities. No fresh ground water is available in the extreme western and southern parts of the parish.

The principal aquifer consists of an almost continuous sequence of coarse sand and gravel generally between depths of 100 and 170 feet and at a base of about 600 feet. Freshwater depths range from 300 feet or more north of Paincourtville along Bayou Lafourche to only 100 feet at Labadieville. Bayou Lafourche and the Mississippi River are the major sources of fresh ground water for the aquifer. The water level in wells in Assumption Parish is related to stages of the Mississippi River, and it fluctuates with the river. The difference between the average high level in spring and the average low level in fall is 10 feet in wells in the northern part of the parish (nearest the river) and 5 to 6 feet at Napoleonville and Labadieville (farthest from the river). The potential yield of a well tapping the principal aquifer in Assumption Parish is several thousand gallons per minute. The actual yield is limited by the size and construction of the well and by the water quality desired.

## Minerals

*Oil and Gas.* Oil and gas have been produced in the parish since 1943, and probably development is not yet complete. Seven fields produced in 1962. They are the Amelia Bay, Natchez, East Lake Palourde, East Lake Verret, Napoleonville, Oakley, and Pierre Pass fields. An eighth field, Bayou St. Vincent, was discovered in 1964.

*Salt.* The Napoleonville field has one of the largest piercement type salt domes on land in south Louisiana. The top of the salt is at approximately the 500-foot contour. A chemical company has leased a portion of the dome and is mining salt by use of brine wells. One brine well has been depleted and is being used for storage purposes.

## Industry

Assumption Parish is one of the important sugar-producing parishes of the state. The processing of sugarcane provides most of the industry in the parish. Sugar, syrup, molasses, bagasse, and other sugarcane-related products are manufactured. Four sugar mills operate in the parish. The residue from sugarcane, bagasse, is dried for use in wallboard production plants outside the parish.

Several oil and gas related industries operate in the parish. Many people are employed in industry in adjacent parishes. In 1973, 47 percent of the total Assumption Parish work force was employed outside the parish.

## History and development

Assumption Parish was named for the Festival of the Assumption of the Virgin Mary. It was created on March 31, 1807, 5 years before Louisiana entered the Union. It had been previously a part of the "Lafourche Settlement," one of the earliest settlements in Louisiana history. The earliest permanent settlements in the parish were made by the French and Spanish along Bayou Lafourche about the middle of the 18th century. During the decade beginning with 1755, the population was greatly increased by exiled Acadians.

The seat of government in Assumption Parish is Napoleonville. It was probably named by an early settler who had been a soldier of Napoleon.

The parish is 100 percent rural. It is 81.5 percent non-farming rural, and 18.5 percent farming rural. In the period 1960 to 1970, the population increased by 9.2 percent, and an additional 9.6 percent increase is predicted by 1980. The 1970 Census lists Napoleonville, the parish seat, as having a population of 1,008.

The main communities are Napoleonville, Paincourtville, Labadieville, Pierre Part, Plattenville, Belle Rose, and Bayou L'Ourse.

## How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the material that has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in parishes nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in

the sections "General soil map for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

## General soil map for broad land use planning

The general soil map at the back of this publication shows, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it 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 kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

The soils in the survey area vary widely in their potential for major land uses. Table 3 shows the extent of the map units shown on the general soil map and gives general ratings of the potential of each, in relation to the other map units, for major land uses. Soil properties that pose limitations to the use are indicated. The ratings of soil potential are based on the assumption that practices

in common use in the survey area are being used to overcome soil limitations. These ratings reflect the ease of overcoming the soil limitations and the probability of soil problems persisting after such practices are used.

Each map unit is rated for *cultivated farm crops, urban uses, intensive recreation areas, and pastureland*. Cultivated farm crops are those grown extensively by farmers in the survey area. Urban uses include residential, commercial, and industrial developments. Intensive recreation areas include campsites, picnic areas, ballfields, and other areas that are subject to heavy foot traffic. Pastureland includes land that is producing planted or introduced grasses for livestock grazing.

## Descriptions of map units

### 1. Barbary

*Level, very poorly drained, nearly continuously flooded, clayey soils*

This unit is in broad, low depressions in the eastern and western sides of the parish. The landscape is swamp.

This unit makes up about 38 percent of the parish. About 76 percent of the unit is Barbary soils, and the remaining 24 percent is soils of minor extent.

The Barbary soils are at the lowest elevations. They have a layer of muck on the surface, and are semifluid. Logs, stumps, and wood fragments are common in all layers.

The minor soils in this unit, at slightly higher elevations, are mostly the very poorly drained Fausse soils and the poorly drained Sharkey soils.

This unit is in woodland (fig. 3) and is used mainly for wildlife habitat and recreation. Flooding and wetness and lack of access are the main limitations to use for farming and for most other purposes.

The potential for wetland wildlife habitat is fair, and the potential as woodland is poor. The potential as cropland and pastureland and for urban use and intensive recreation areas is very poor. Flooding and wetness are severe and difficult to overcome. The buried logs and stumps are a major concern in the development of this unit.

### 2. Commerce

*Nearly level, somewhat poorly drained, loamy soils*

This unit is on high and intermediate parts of natural levees of the Mississippi River distributaries throughout the parish but is mainly on the natural levee of Bayou Lafourche in the central part of the parish.

This unit makes up about 29 percent of the parish. About 88 percent of the unit is Commerce soils, and the remaining 12 percent is minor soils.

The Commerce soils are on the higher elevations. These soils are loamy throughout. They have a seasonal high water table.

The minor soils in this unit are the poorly drained Sharkey and Tunica soils, which occupy depressional areas or are at lower elevations on natural levees.

The soils of this unit are intensively used for sugarcane production. A small acreage along Bayou Lafourche has been used for building sites. Surface drainage systems have been installed on most of the acreage. Few natural drainageways exist. Wetness is the main limitation to most uses.

The potential as cropland and pastureland is excellent. The loamy texture, high fertility, and nearly level slopes make the soils of this unit the choice cropland area of the parish. A surface drainage system is required for maximum production. The potential for urban use and intensive recreation areas is fair. Soil wetness is not difficult to overcome. The potential as woodland and for wildlife habitat is good, but the value of the unit as cropland and for urban use overshadows this use.

### 3. Sharkey

*Level, poorly drained, clayey soils*

This unit is mainly on the intermediate parts of the natural levees of Bayou Lafourche.

This unit makes up about 11 percent of the parish. About 90 percent of the unit is Sharkey soils, and the remaining 10 percent is minor soils.

The Sharkey soils are clayey throughout. They have a seasonal high water table.

The minor soils in this unit are the loamy, somewhat poorly drained Commerce soils at higher elevations and the clayey, very poorly drained Fausse soils at lower elevations.

The soils in this unit are used mostly as cropland. A few small areas are in woodland. Sugarcane is the main crop. A few natural drainageways exist. Surface drainage systems have been installed on most of the acreage. Soil wetness and the clayey soil texture are limitations for most uses. Low strength and high shrink-swell potential are limitations if the soil is used for foundations or as construction material.

The potential as cropland and pastureland is good. The soils of this unit are difficult to work, and soil wetness is a concern. A surface drainage system is needed for maximum crop production. The potential for urban use is poor. Wetness, high shrink-swell potential, and low strength are costly and difficult to overcome. The potential for intensive recreation areas is poor. The wetness and clayey texture are difficult to overcome. The potential as woodland and for wildlife habitat is good, but the value of this unit as cropland overshadows this use.

### 4. Fausse-Sharkey

*Level, very poorly drained and poorly drained, frequently flooded, clayey soils*

This unit is adjacent to the lowest elevations in the parish in the eastern and western sides of the parish.

This unit makes up 22 percent of the parish. About 70 percent of the area is Fausse soils, 25 percent is Sharkey soils, and 5 percent is minor soils.

The Fausse soils are at slightly lower elevations than the Sharkey soils. Fausse soils are very poorly drained and Sharkey soils are poorly drained. Both soils have a clayey surface layer.

The minor soils in this unit are mostly the very poorly drained Barbary soils at the lowest elevations.

This unit is used mainly as woodland and for wildlife habitat and recreation. Several oil and gas fields are partly in this unit, and sizable areas are used by hunting clubs. Flooding and soil wetness are the principal limitations to use for farming and for most other purposes. Some areas of the Sharkey soils at higher elevations are flooded less frequently than Fausse soils. The Fausse soils are generally flooded to a greater depth and for longer periods of time.

The potential as woodland and for wetland wildlife habitat is good. The potential as cropland and pastureland and for urban use and intensive recreation areas is very poor. Flooding and wetness are severe and difficult to overcome.

If flooding is controlled, the potential use of this unit is similar to that of the Sharkey unit.

## Broad land use considerations

The general soil map units in Assumption Parish differ widely in suitability for various land uses. Information about soils can be used as a guide in planning the orderly growth and development of the parish, and is especially helpful in determining which lands to allocate to a particular use.

The Commerce and Sharkey units have excellent and good potential as cropland and pastureland. They are level or nearly level, have high fertility, and are not subject to flooding. They are the choice lands of the parish for farming, but surface drainage systems generally are necessary to remove excess water from the surface in order to achieve maximum crop production. The flooding hazard precludes the use of the remaining units in the parish as cropland. Many areas within the Fausse-Sharkey unit, however, are suitable as cropland and pastureland if flooding is controlled.

The Commerce and Sharkey units have good potential as woodland, but their value for farming overshadows their value as woodland. The permanently high water table and the almost continuous flooding over much of the Barbary and Fausse-Sharkey units severely restrict their potential as woodland.

The Commerce unit has the best potential in the parish for urban use and intensive recreation areas. Wetness and low strength are not difficult to overcome. The hazard of flooding, wetness, and high shrink-swell potential are major soil limitations that greatly reduce the potential of the other map units in the parish for urban use and intensive recreation areas.

## Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information about each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have profiles that are almost alike make up a *soil series*. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Sharkey silty clay loam is one of several phases within the Sharkey series.

Some map units are made up of two or more dominant kinds of soil. The only such kind of map unit in Assumption Parish is the soil association.

A *soil association* is made up of soils that are geographically associated and are shown as one unit on the map because it is not practical to separate them. A soil association has considerable regularity in geographic pattern and in the kinds of soil that are a part of it. The extent of the soils can differ appreciably from one delineation to another; nevertheless, interpretations can be made for use and management of the soils. Barbary association is an example.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrast-

ing soils that are included are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 4, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

**BA—Barbary association.** This unit consists of very poorly drained, semifluid soils in broad, low depressions in the eastern and western sides of the parish. The landscape is swamp and a few low, narrow, natural levee ridges. These soils formed in clayey Mississippi River alluvium. A thin layer of muck has accumulated over the semifluid soils. Much of the area is almost continuously flooded. Elevation is less than 3 feet above sea level. Mapped areas are mostly irregularly shaped and range from 200 to several thousand acres in size. Slope gradient is less than 0.2 percent.

The Barbary soils, in broad depressions, make up about 80 percent of the map unit. Included in mapping are areas of Fausse and Sharkey soils and soils that are similar to Barbary soils except that more than 8 inches of muck overlies the surface layer. These included areas make up about 20 percent of the map unit. The Fausse and Sharkey soils are on low, natural levee ridges. The soils having the thickest layer of muck on the surface are at the lowest places in the broad depressions.

Typically, the surface layer of the Barbary soils is overlain by slightly acid, very dark brown muck about 6 inches thick. The surface layer is neutral, dark gray, semifluid mucky clay about 4 inches thick. The next layer extends to a depth of about 14 inches and is neutral, gray, semifluid clay. Below this to a depth of 60 inches or more is mildly alkaline to moderately alkaline, greenish gray, semifluid clay. Logs, stumps, and wood fragments are common below the surface layer.

The Barbary soils are high in fertility. They are almost continuously flooded. Floodwaters at a depth of as much as 3 feet are above the surface from December through June. In periods of nonflooding the water table fluctuates between a depth of one-half foot below the surface to 1 foot above the surface.

Most of the unit is in woodland and is used chiefly for wildlife habitat and for recreation. A limited amount of Spanish moss is harvested for sale. Trees common throughout this area include water tupelo, baldcypress, and black willow.

The potential as cropland and pastureland is very poor because of wetness and flooding.

The potential as woodland is poor due to poor trafficability, wetness, and flooding.

The potential for urban use or intensive recreation areas is very poor principally because of flooding, wetness, and buried logs and stumps that interfere with development. If the soil is protected and drained, large cracks form that do not close even when the soil is wet.

These soils provide natural habitat for many wildlife species. Capability subclass VIIw, woodland suitability group 4w6.

**Cc—Commerce silt loam.** This nearly level, loamy soil is on the high parts of natural levees of the Mississippi River distributaries throughout the parish. It formed in loamy alluvium. Individual areas are 15 to 1,000 acres in size. Slope gradient is less than 1 percent.

Typically, the surface layer is neutral, dark grayish brown silt loam about 8 inches thick over neutral, dark gray silt loam about 4 inches thick. The subsoil to a depth of about 18 inches is neutral, grayish brown silty clay loam mottled with yellowish brown. Below this, to a depth of about 31 inches, is moderately alkaline, grayish brown silty clay loam mottled with yellowish brown and gray. The underlying material, to a depth of 60 inches or more, is moderately alkaline, grayish brown and gray silty clay loam mottled with gray and brown.

This soil is high in fertility. Water and air move moderately slowly through the soil. Plant roots penetrate easily. Water runs off the surface at a slow to medium rate. The subsoil is wet for long periods in winter and spring. The seasonal high water table fluctuates between depths of 1.5 and 2.5 feet from December through April. The surface layer is wet for significant periods in winter and spring. Adequate moisture is available to plants in most years.

Included with this soil in mapping are a few small areas of Commerce silty clay loam. Also included are small areas of soils, mainly in the western part of the parish, that are similar to the Commerce soils except that they are acid to a depth of about 24 inches and have a more developed profile. The included soils make up about 15 percent of the map unit, but separate areas generally are less than 3 acres in size.

Most acreage is in cropland. Sugarcane is the main crop (fig. 4). A small acreage is in pastureland, woodland, and homesites.

The potential of this soil as cropland and pastureland is excellent. The nearly level slopes, high fertility, and loamy texture make this a choice soil for cropland in the parish. The main suitable crops are sugarcane, soybeans, corn, small grain, and truck crops. The main suitable pasture plants are common bermudagrass, improved bermudagrass, dallisgrass, bahiagrass, tall fescue, johnsongrass, white clover, and southern wild winter peas.

This soil is friable and is easy to keep in good tilth. Traffic pans develop when this soil is cultivated, but they can be broken by chiseling or deep plowing. A surface drainage system is needed for optimum production of most cultivated crops. Land smoothing or grading improves surface drainage and increases the efficiency of farm equipment. Proper crop residue management helps maintain organic matter content and reduce soil loss by erosion. Most crops other than legumes respond well to nitrogen fertilizer. Applications of lime or other fertilizers generally are not needed.

The potential for urban use and intensive recreation areas is fair. Wetness is the main limitation where this soil is used for septic tank absorption fields, sanitary landfills, homesites, and local roads and streets. Low strength is a limitation where the soil is used for foundations or as construction material.

The potential of this soil as woodland and for certain kinds of wildlife habitat is good but the value of the soil as cropland and pastureland and for urban uses overshadows this use. Capability subclass IIw, woodland suitability group 1w5.

**Cm—Commerce silty clay loam.** This nearly level, loamy soil is on intermediate parts of the natural levees of the Mississippi River distributaries throughout the parish. It formed in loamy alluvium. Individual areas are 15 to 1,000 acres in size. Slope gradient is less than 1 percent.

Typically, the surface layer is slightly acid, dark grayish brown silty clay loam about 6 inches thick over slightly acid, dark grayish brown silty clay loam that has brown mottles and is about 6 inches thick. The subsoil, to a depth of about 35 inches, is neutral, grayish brown silt loam that has yellowish brown mottles. The underlying material, to a depth of 60 inches or more, is moderately alkaline, grayish brown silt loam that has dark yellowish brown mottles.

The soil is high in fertility. Water and air move moderately slowly through the soil. Plant roots have little difficulty in penetrating the soil. Water runs off the soil at a slow rate. The upper part of the subsoil is wet for much of the winter and spring. The seasonal high water table fluctuates between depths of 1.5 and 2.5 feet from December through April. Water stands in depressions and on the lower areas for short periods after heavy rains. Adequate moisture is available to plants in most years.

Included with this soil in mapping are a few small areas of Commerce silt loam and Sharkey silty clay loam. Also included, mainly in the western part of the parish, are small areas of soils that are similar to the Commerce soils except that they are acid to a depth of 24 inches and have a more developed profile. The included soils make up about 15 percent of this map unit, but separate areas generally are less than 3 acres in size.

Most acreage is in cropland. Sugarcane is the main crop (fig. 5). Small acreages are in pastureland, woodland, and homesites.

The potential as cropland and pastureland is excellent. The nearly level slopes and high fertility make this a choice soil for cropland. Soil wetness and the silty clay loam surface texture, however, make the soil slightly less desirable than Commerce silt loam for cropland. The main suitable crops are sugarcane, soybeans, small grain, corn, rice, and truck crops. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, dallisgrass, ryegrass, johnsongrass, tall fescue, southern wild winter peas, and white clover.

Good tilth is somewhat difficult to maintain because of the silty clay loam surface layer. The moderately high

clay content in the surface layer restricts the use of farm equipment in wet periods. Drainage is needed for both cropland and pastureland to remove excess water from the surface. Land grading or smoothing improves surface drainage and increases the efficiency of farm equipment. Proper crop residue management helps maintain organic matter content, improve tilth, and reduce soil loss by erosion. Most crops other than legumes respond well to nitrogen fertilizer. Application of lime or other fertilizer generally is not needed.

The potential for urban use and intensive recreation areas is fair. Wetness is the principal limitation where this soil is used for septic tank absorption fields, sanitary landfills, homesites, and local roads and streets. Low strength is a limitation where the soil is used for foundations or as construction material.

The potential of this soil as woodland and for certain kinds of wildlife habitat is good but the value of the soil as cropland and for urban use overshadows this use. Capability subclass IIw, woodland suitability group 1w5.

**FA—Fausse association.** This map unit consists of very poorly drained soils that formed in clayey Mississippi River alluvium. These soils are adjacent to natural levees in broad depressions throughout the eastern and western sides of the parish. The landscape is swamp. These soils are frequently flooded. Elevation is less than 5 feet above sea level. Slope gradient is less than 0.5 percent. Individual areas are mostly elongated in shape and range from 500 to 1,000 acres in size.

The Fausse soils make up about 80 percent of the map unit. Included in mapping are areas of Sharkey and Barbary soils, which make up 20 percent of the map unit. The Sharkey soils are at slightly higher elevations than the Fausse soils, and the Barbary soils are at slightly lower elevations. They occur in small tracts.

Typically, the surface layer of the Fausse soils is neutral, dark gray clay about 12 inches thick. The subsoil, to a depth of about 40 inches, is moderately alkaline, gray clay that has mottles in shades of brown. The underlying material, to a depth of 60 inches or more, is moderately alkaline, gray clay that has dark yellowish brown mottles.

The Fausse soils are high in fertility. They are flooded in most years from December through June. Depth of floodwaters exceeds 3 feet at times. During nonflood periods, the water table fluctuates between a depth of 1.5 feet below and one-half foot above the surface. These soils crack when dry and seal over when wet. Adequate moisture is available to plants in most years.

Most acreage is in woodland and is used primarily for wildlife habitat and recreation. Trees commonly growing on Fausse soils include baldcypress, black willow, green ash, honeylocust, pumpkin ash, sweetgum, water elm, water hickory, water locust, and water tupelo. Some of the area is used for commercial crawfishing, and a small acreage is in oil and gas fields.

The potential as cropland and pastureland is very poor chiefly because of flooding and wetness.

The potential as woodland is poor because of flooding and wetness (fig. 6).

The potential for urban use and intensive recreation areas is very poor. Flooding and wetness are the principal limitations for such uses as septic tank absorption fields, sanitary landfills, homesites, and local roads and streets. High shrink-swell potential and low strength are limitations for use as foundations or as construction material.

These soils provide natural habitat and haven for many wildlife species.

If these soils are protected from flooding, the potential as cropland is good. The potential for urban use and intensive recreation areas is poor. Capability subclass VIIw, woodland suitability group 4w6.

**Sa—Sharkey silty clay loam.** This level soil is on low and intermediate parts of the natural levees of the Mississippi River distributaries throughout the parish. It formed in clayey alluvium. Individual areas range from 15 to 700 acres in size. Slope gradient is less than 1 percent.

Typically, the surface layer is neutral, dark grayish brown silty clay loam about 4 inches thick over mildly alkaline, dark gray silty clay loam about 6 inches thick. The subsoil, to a depth of about 43 inches, is moderately alkaline, gray clay mottled in shades of brown. The underlying material, to a depth of 60 inches or more, is moderately alkaline, gray clay that has dark yellowish brown mottles.

This soil is high in fertility. Wetness causes poor aeration and restricts root development of many plants. Water and air move very slowly through the soil. Water runs off the surface at a slow to very slow rate. Water stands in low areas for short periods after heavy rains. The seasonal high water table fluctuates between a depth of 2 feet and the surface from December through April. The surface layer is wet for long periods in winter and spring. This soil dries out more slowly than most adjoining soils at higher elevations. This soil has very high shrink-swell potential. It cracks when dry and seals over when wet. Adequate moisture is available to plants in most years.

Included with this soil in mapping are a few areas of Commerce and Tunica soils. Also included are small areas of Sharkey clay. The included soils make up about 15 percent of the map unit. Separate areas of included soils generally are less than 2 acres in size.

Most acreage is in cropland and pastureland. A small acreage is in woodland and homesites.

The potential as cropland and pastureland is good. The high fertility and nearly level soil are very favorable for cultivated crops; wetness and the moderately high clay content of the surface layer are less favorable features. The main suitable crops are corn, truck crops, grain sorghum, rice, sugarcane, and soybeans. The main suitable pasture plants are common bermudagrass, dallisgrass, johnsongrass, bahiagrass, ryegrass, tall fescue, southern wild winter peas, and white clover.

This soil tends to be sticky when wet and hard when dry, and is somewhat difficult to keep in good tilth. It can be worked within only a narrow range of moisture content and may become cloddy when worked. Wetness can

delay planting and harvesting of crops. A drainage system is needed on cropland and pastureland. Land grading or smoothing improves surface drainage and increases the efficiency of farm equipment. Proper crop residue management helps maintain organic matter content, improve tilth, and reduce soil loss by erosion. Irrigation is needed for rice. Most crops other than legumes respond well to nitrogen fertilizer. Application of lime or other fertilizer generally is not needed.

The potential for urban use and intensive recreation areas is poor. Wetness is a limitation for such uses as septic tank absorption fields, sanitary landfills, homesites, and local roads and streets. High shrink-swell potential and low strength are limitations for use of the soil for foundations or as construction material.

The potential of this soil as woodland and for certain kinds of wildlife habitat is good but the value of the soil as cropland and pastureland overshadows this use. Capability subclass IIIw, woodland suitability group 2w6.

**Sh—Sharkey clay.** This level, clayey soil is on lower parts of the natural levees of the Mississippi River distributaries throughout the parish. It formed in clayey alluvium. Individual areas range from about 10 to more than 1,000 acres in size. Slope gradient is less than 1 percent.

Typically, the surface layer is neutral, dark gray clay about 13 inches thick. The subsoil to a depth of about 25 inches is mildly alkaline, dark gray clay that has dark yellowish brown mottles. Below this, to a depth of about 53 inches, is moderately alkaline, gray clay mottled in shades of brown. The underlying material, to a depth of 60 inches or more, is moderately alkaline, gray silty clay loam that has yellowish brown mottles.

This soil is high in fertility. Wetness causes poor aeration and restricts root development of many plants. Water and air move very slowly through the soil. Water runs off the surface at a slow to very slow rate and stands in low areas for short periods after heavy rains. The seasonal high water table fluctuates between a depth of 2 feet and the surface from December through April. The surface layer is wet for long periods in winter and spring. This soil dries out more slowly than most adjoining soils at higher elevations. It has very high shrink-swell potential. It cracks when dry and seals over when wet. Adequate moisture is available to plants in most years.

Included with this soil in mapping are a few small areas of Tunica and Commerce soils and Sharkey silty clay loam. These included soils are at slightly higher elevations. Also included are small areas of frequently flooded Sharkey clay. The included soils make up about 10 percent of this map unit, but separate areas generally are less than 2 acres in size.

Most acreage is in cropland and pastureland. A small acreage is in woodland and homesites. Sugarcane and soybeans are the main crops.

The potential as cropland and pastureland is good. The high fertility and level soil are favorable for cultivated

crops; wetness and clayey texture of the soil are less favorable features. The main suitable crops are sugarcane, soybeans, grain sorghum, and rice. The main suitable pasture plants are common bermudagrass, bahiagrass, dallisgrass, ryegrass, tall fescue, and white clover.

This soil is sticky when wet, hard when dry, and difficult to keep in good tilth. It can be worked within only a narrow range of moisture content and may become cloddy when worked. Wetness can delay planting and harvesting of crops. A drainage system is needed on cropland and pastureland. Land grading or smoothing improves surface drainage and increases the efficiency of farm equipment. Proper crop residue management helps maintain organic matter content, improve tilth, and reduce soil loss by erosion. Irrigation is needed for rice. Most crops other than legumes respond well to nitrogen fertilizer. Application of lime or other fertilizer generally is not needed.

The potential for urban use and intensive recreation areas is poor. Wetness is a limitation for such uses as septic tank absorption fields, sanitary landfills, homesites, and local roads and streets. High shrink-swell potential is a limitation for use as foundations or as construction material.

The potential of this soil as woodland and for certain kinds of wildlife habitat is good but the value of the soil as cropland overshadows this use. Capability subclass IIIw, woodland suitability group 2w6.

**Sk—Sharkey clay, frequently flooded.** This level, clayey soil is on the lower parts of the natural levees of the Mississippi River distributaries throughout the parish. It is subject to frequent flooding. It formed in clayey alluvium. Individual areas range from a few hundred to several hundred acres in size. Slope is less than 0.5 percent.

Typically, the surface layer is neutral, very dark gray clay about 5 inches thick. The subsoil to a depth of about 16 inches is mildly alkaline, dark gray clay that has dark yellowish brown mottles. Below this, to a depth of about 50 inches, is moderately alkaline gray clay that has brownish mottles. The underlying material, to a depth of 60 inches or more, is moderately alkaline, dark gray clay.

This soil is high in fertility. Water runs off the surface at a very slow rate. Water and air move very slowly through the soil. Wetness causes poor aeration and restricts root development of many plants. This soil is subject to frequent flooding; as much as 2 feet of water stands on the surface from December through April. When the soil is not flooded, the water table fluctuates between a depth of 2 feet and the surface. This soil has very high shrink-swell potential. It cracks when dry and seals over when wet. Adequate moisture is available to plants in most years.

Included with this soil in mapping are a few small areas of Fausse soils. Also included are some higher areas of Sharkey and Tunica soils that are not subject to frequent flooding. Included soils make up about 10 percent of the map unit, but separate areas generally are less than 3 acres in size.

Most acreage is in woodland and is used mostly for wildlife habitat and recreation. Trees commonly growing on this soil include black willow, common persimmon, Drummond red maple, green ash, honeylocust, overcup oak, sugarberry, sweetgum, water hickory, water locust, and water oak.

The potential for cropland and pasture is very poor because of wetness and flooding. Common bermudagrass and bahiagrass are suitable pasture plants. On some of the higher areas, where flooding is less severe, other plants may be suitable. Length of grazing time is severely restricted by long flood periods.

This soil has fair potential for woodland; however, the wetness and flooding make management difficult.

The potential for urban use and intensive recreation areas is very poor. Flooding and wetness are the principal limitations for such uses as septic tank absorption fields, sanitary landfills, homesites, and local roads and streets. High shrink-swell potential and low strength are limitations for use as foundations or as construction material.

This soil provides good natural habitat and haven for many wildlife species.

If this soil is protected from flooding, the potential as cropland and pastureland is good. The potential for urban use and intensive recreation areas is poor. Capability subclass Vw, woodland suitability group 3w6.

**Tu—Tunica clay.** This level soil is on lower and intermediate parts of the natural levees of the Mississippi River distributaries throughout the parish. It is clayey in the upper layers and loamy in the lower layers. It formed in clayey over loamy alluvium. Individual areas range from 20 to 60 acres in size. Slope gradient is less than 1 percent.

Typically, the surface layer is slightly acid, very dark grayish brown silty clay about 4 inches thick over neutral, dark gray clay about 4 inches thick. The subsoil to a depth of about 20 inches is neutral, gray clay that has dark yellowish brown mottles. Below this, to a depth of about 25 inches, is mildly alkaline, gray clay that has olive brown mottles. The underlying material, to a depth of 60 inches or more, is moderately alkaline, grayish brown silt loam mottled in shades of brown.

This soil is high in fertility. Wetness causes poor aeration and restricts root development of many plants. Water and air move very slowly through the soil. The surface layer is wet for long periods in winter and spring. The seasonal high water table fluctuates between depths of 1.5 and 3 feet from December through April. This soil dries out more slowly than the adjoining loamy soils at higher elevations. It has very high shrink-swell potential. It cracks when dry and seals over when wet. Adequate moisture is available to plants in most years.

Included with this soil in mapping are a few small areas of Sharkey and Commerce soils. Also included are small areas of soils that are similar to Tunica soils but that are clayey to a depth of less than 20 inches. Included soils make up about 15 percent of the map unit; however, separate areas of included soils generally are less than 3 acres in size.

Most acreage is in pastureland, woodland, and cropland. Soybeans and sugarcane are the main crops.

The potential as cropland and pastureland is good. The level slope and high fertility of the soil are favorable for cultivated crops; wetness and the clayey surface layer are less favorable features. The main suitable crops are sugarcane, soybeans, rice, and grain sorghum. The main suitable pasture plants are common bermudagrass, bahiagrass, dallisgrass, johnsongrass, tall fescue, ryegrass, white clover, and southern wild winter peas.

This soil is sticky when wet, hard when dry, and difficult to keep in good tilth. It can be worked within only a narrow range of moisture content and may become cloddy when worked. Wetness can delay planting and harvesting of crops. A drainage system is needed on cropland and pastureland. Land grading or smoothing improves surface drainage and increases the efficiency of farm equipment. Proper crop residue management helps maintain organic matter content, improve tilth, and reduce soil loss by erosion. Irrigation is needed for rice. Most crops other than legumes respond well to nitrogen fertilizer. Application of lime or other fertilizer generally is not needed.

The potential for urban use and intensive recreation areas is poor. Wetness is the principal limitation for such uses as septic tank absorption fields, sanitary landfills, homesites, and local roads and streets. High shrink-swell potential is a limitation where the soil is used for foundations or as construction material.

The potential of this soil is good as woodland and for certain kinds of wildlife habitat but the value of the soil as cropland and pastureland overshadows this use. Capability subclass IIIw, woodland suitability group 2w6.

## Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture and woodland; as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities; and for wildlife habitat. From the data

presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of wetness, which causes difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

## Crops and pasture

DALE ROCKETT, agronomist, Soil Conservation Service, helped prepare this section.

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the system of land capability classification used by the Soil Conservation Service is explained and the estimated yields of the main crops and pasture plants are presented for each soil.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

Specific recommendations for fertilizers, crop varieties, and seedling mixtures are not given. These change from time to time as more complete information is obtained. For more detailed information, consult the local staff of the Soil Conservation Service, the Extension Service, or the Louisiana Agricultural Experiment Station.

About 70,000 acres in Assumption Parish were used for crops and pasture in 1967, according to a conservation needs inventory published in 1969. Of this total, about 65,400 acres were used for row crops, mainly sugarcane and fallow sugarcane land, and about 4,600 acres were used for pasture. Sugarcane acreage fluctuates according

to sugar programs and prices, but harvested acreage the past few years has been about 35,000 to 40,000 acres annually. Total cropland and pastureland acreage has decreased owing to the abandonment of marginal soils previously used for sugarcane and also to the loss of acreage to industrial sites.

Differences among the soils in such factors as fertility needs, erodibility, organic matter content, water available for plant growth, soil tillage, drainage needs and flooding hazard, and cropping systems result in differences in crop suitability and management needs. Each farm has its own soil pattern and therefore its own management problems. Some principles of farm management, however, apply only to specific soils and to certain crops. This section of the survey presents the general principles of management which can be applied widely to the soils of Assumption Parish.

*Fertilizing and liming.*—The amount of fertilizer needed depends upon (1) the crop to be grown, (2) the past cropping history, (3) the level of yield desired, and (4) the soil type. Specific recommendations should be based on soil tests.

A soil sample for laboratory testing should consist of a single soil type and should represent no more than 10 acres. Agricultural agencies in the parish can supply detailed information and instruction regarding the taking of soil samples.

The soils in Assumption Parish range in reaction from medium acid to moderately alkaline in the upper 20 inches. They generally do not require lime.

*Organic matter content.*—Organic matter is important as a source of nitrogen for crop growth and is also important in increasing the water intake rate, reducing surface crusting and soil loss by erosion, and in promoting a good mellow condition of the soil on the surface. Most soils in Assumption Parish are moderately low in organic matter content.

Organic matter can be built up to a limited extent and maintained by leaving plant residue on the soil, promoting growth of larger plants and plants that have extensive root systems, adding barnyard manure, and growing perennial grasses and legumes in rotation with other crops. In this parish, sugarcane plant residue is an important tool in maintaining organic matter content (fig. 7).

*Soil tillage.*—The major purpose of soil tillage is seedbed preparation and weed control. Seedbed preparation and cultivating and harvesting operations, however, generally help destroy soil structure. Excessive cultivation of the soils should be avoided. Some of the fine textured soils in the parish become cloddy when cultivated. A compacted layer develops in the medium textured soils when they are plowed at the same depth for long periods or if they are wet when plowed. This compacted layer is generally known as a traffic pan, or plowpan, and it develops just below plow depth. The development of this compacted layer can be avoided by not plowing when the soil is wet, by varying the depth of plowing, or by subsoiling or chiseling.

Some tillage implements stir the surface and leave crop residues on the surface for protection from beating rains. Use of such implements helps control erosion, reduce runoff, and increase infiltration.

*Drainage needs and flooding hazard.*—Many soils in the parish need surface drainage. Early drainage methods involved a complex pattern of main ditches, laterals, and field drains. The more recent approach to drainage in this parish combines land leveling and grading with a minimum of open ditches. This approach creates larger and more uniformly shaped fields which are more suitable for the use of modern multirow farm machinery.

The Mississippi River levee system protects most cropland and pastureland from flooding. Nevertheless, some soils at the lower elevations are subject to flooding from runoff from higher areas. Flooding on many of these areas can be controlled only by constructing a ring levee system and using pumps to remove excess water.

*Water for plant growth.*—In Assumption Parish water is commonly available for optimum plant growth without irrigation. Large amounts of rainfall occur in summer and have a distribution pattern that favors the growth of sugarcane. This rainfall pattern precludes economical production of certain crops; cotton, for example, is better suited to a drier climate. The available water capacity of soils suited to crops is high to very high.

*Cropping system.*—A desirable combination of crops in a good cropping system 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 organic matter content. In a good cropping system, the sequence of crops should be such that the soil is covered as much of the year as possible.

In this parish, three crops of sugarcane are generally obtained from each planting. After the third crop, the field is planted to soybeans or, more commonly, is fallowed for a year. The organic matter content of the soil can be maintained at a desirable level under this system by properly utilizing the sugarcane plant residue.

A suitable cropping system varies with the needs of the farmer and the soil. Producers of livestock, for example, generally use cropping systems that have a higher percentage of pasture than cash-crop farmers. Additional information on cropping systems can be obtained from the Soil Conservation Service, the Extension Service, or the Louisiana Agricultural Experiment Station.

*Control of erosion.*—Erosion is not a serious problem in Assumption Parish mainly because of the level to nearly level slope gradient. Nevertheless, sheet erosion is somewhat high on fallow, plowed fields and on newly constructed drainage ditches. Some gully erosion takes place at overfalls into drainage ditches. Sheet erosion can be reduced by maintaining a plant or plant residue cover on the soil, by holding the number of cultivations of a crop to a minimum, and by controlling weeds by methods other than fallow plowing. Newly constructed ditches need to be seeded immediately after construction. Water control

structures placed at overfalls into drainage ditches control gully erosion.

### Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the crop is not suited to or not commonly grown on the soil.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Pasture yields were estimated for the most productive varieties of grasses suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and micronutrients for each crop; effective use of crop residues and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

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

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

### Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take

into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

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

Class I soils have few limitations that restrict their use.

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

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

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

Class V soils are not likely to erode but 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 landforms 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*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

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

The capability subclass is identified in the description of each soil map unit in the section "Soil maps for detailed planning." Capability units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Thus, the capability unit is a convenient grouping for making many statements about management of soils.

Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

## Woodland management and productivity

H. FORD FALLIN, forester, Soil Conservation Service, helped prepare this section.

Originally, Assumption Parish was completely wooded except for a few areas of open water. Presently, southern hardwood trees cover about 137,000 acres, or 62 percent of the parish. Most of this acreage is composed of low-elevation sites that are subject to flooding.

Few good stands of commercial trees are produced in the woodlands of the parish, and the potential value is somewhat low. A statistical survey in 1969 showed that the value of forest products was less than 0.1 percent of the total value of farm products for the parish. Other uses for woodland are wildlife habitat, recreation, enjoyment of natural beauty, and the conservation of soil and water. This section discusses the effect of soils on growth and management of trees.

Table 6 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Map unit symbols for soils suitable for wood crops are listed, and the ordination (woodland suitability) symbol for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: *x*, *w*, *t*, *d*, *c*, *s*, *f*, and *r*.

The third element in the symbol, a numeral, indicates the kind of trees for which the soils in the group are best suited and also indicates the severity of the hazard or limitation. The numerals 1, 2, and 3 indicate slight, moderate, and severe limitations, respectively, and suitability for needleleaf trees. The numerals 4, 5, and 6 indicate slight, moderate, and severe limitations, respectively, and suitability for broadleaf trees.

In table 6 the soils are also rated for a number of factors to be considered in management. *Slight*, *moderate*, and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the

expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

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

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

The *potential productivity* of merchantable or *important trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Important trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

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

## Engineering

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were 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 or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of clay and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

*Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.*

The information is presented mainly in tables. Table 7 shows, for each kind of soil, the degree and kind of limitations for building site development; table 8, for sanitary facilities; and table 10, for water management. Table 9 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

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

### Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings without basements, small commercial buildings, and local roads and streets are indicated in table 7. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

*Shallow excavations* are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table and the texture and consistence of soils. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given.

*Dwellings and small commercial buildings* referred to in table 7 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for lawns and gardens. Susceptibility to flooding is a serious hazard and was also considered in determining the ratings.

*Local roads and streets* referred to in table 7 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, and shrink-swell potential are indicators of the traffic supporting capacity used in making the

ratings. Soil wetness and flooding affect stability and ease of excavation.

### Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 8 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, or *poor*, which, respectively, mean about the same as the terms *slight*, *moderate*, and *severe*.

*Septic tank absorption fields* are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, and susceptibility to flooding.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

*Sewage lagoons* are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold 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. Soils that are very high in content of organic matter are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Susceptibility to flooding also

affects the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

*Sanitary landfill* is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 8 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

*Daily cover for landfill* should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty are better than other soils. Clayey soils may be sticky and difficult to spread.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

### Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 9 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

*Roadfill* is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The

ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 13 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential. They are at least moderately well drained. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential or wetness.

*Sand* and *gravel* are used in great quantities in many kinds of construction. All of the soils in Assumption Parish are fine grained and are unsuitable for sand and gravel.

*Topsoil* is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by wetness. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are low in soluble salts that can limit or prevent plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are firm and more loamy.

Soils rated *poor* are clayey, poorly to very poorly drained, and contain excess humus.

### Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 10 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Soil and site limitations are expressed as slight, moderate, and severe. *Slight* means that the soil properties and site features are generally favorable for the specified use and that any limitation is minor and easily

overcome. *Moderate* means that some soil properties or site features are unfavorable for the specified use but can be overcome or modified by special planning and design. *Severe* means that the soil properties and site features are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

*Pond reservoir areas* hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to permeable material.

*Embankments, dikes, and levees* require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics.

*Drainage* of soil is affected by such soil properties as permeability; texture; depth to clayey layers or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; and availability of outlets for drainage.

*Irrigation* is affected by such features as slope, susceptibility to flooding, texture, rate of water intake at the surface, permeability of the soil below the surface layer, available water capacity, need for drainage, and depth to the water table.

*Grassed waterways* are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

## Recreation

The soils of the survey area are rated in table 11 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

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

The information in table 11 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 8, and interpretations for dwellings without basements and for local roads and streets, given in table 7.

*Camp areas* require such site preparation as shaping and leveling for 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 for this use 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 use as picnic areas are firm when wet, are not dusty when dry, and are not subject to flooding during the period of use.

*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.

*Paths and trails* for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use.

## Wildlife habitat

By RAY SMITH, biologist, Soil Conservation Service.

Wildlife adds to the recreational and environmental attractiveness of an area. The wildlife population of Assumption Parish is of moderate density. Two factors that work against high bird and mammal population are intense agricultural activity in the cleared area in which little habitat is present, and flooding of the woodland. Although the woodlands and swamps are subject to flooding, they provide the best habitat for many forms of wildlife.

Open farmland produces mainly sugarcane and a little pasture. Here the population of quail, cottontail rabbit, and dove are low. The clean farming, spraying of ditchbanks, building of berms, and other methods of brush and weed control have reduced the available habitat for upland game animals and birds. Nongame animals and birds also suffer because of the lack of suitable habitat. Some shore birds and common snipe probably derive the most use from the open fields in winter.

Woodland species of game and nongame animals and birds thrive in this parish because of large areas of woodland. Deer, squirrel, swamp rabbit, and wood duck are present in high to moderate numbers. Native wild turkeys, released in 1970 near Pierre Part, reportedly have been reproducing but are not yet established in numbers high enough for hunting.

The lakes, bayous, and swamps of this parish are the winter home for many migratory ducks, for example, mallard, teal, pintail, scaup, ring-necked, and others. The only native ducks in this area are the wood duck and the mottled duck.

Another common migratory bird is the woodcock. It feeds at night in open land near or in the woodland and in daytime retreats to dense cover in the woodland.

The woodlands and swamps of the parish are also the home of numerous nongame birds and animals. Warblers, vireos, flycatchers, kinglets, sparrows, woodpeckers, thrashers, herons, owls, and other birds are numerous. These areas also act as roosts and rookeries for hordes of blackbirds in winter and for herons, egrets, and other wading birds in spring and summer.

Armadillos, white-footed mice, shrews, woodrats, and bats commonly live in the woodlands. Also present in considerable numbers are various reptiles and amphibians. Crawfish are abundant in the swamps, and large poundages are harvested every year late in winter and in spring.

The furbearers commonly found in the woodlands and waters of Assumption Parish are muskrat, raccoon, otter, bobcat, mink, and nutria. They are harvested annually in varying numbers in winter.

The threatened and endangered species that have been, or are most likely to be, found are: bald eagle, peregrine falcon, Bachman's warbler, southern panther, and American alligator.

Assumption Parish has a large amount of surface water. The total acreage of water in Lake Verret and smaller lakes is more than 21,000 acres. A small surface acreage is in bayous and canals. This water produces good to excellent fishing. The game fish are such species as largemouth bass; white crappie; grass pickerel; bluegill; redear, green, longear, and spotted sunfish; and flier. Also present are many commercial and forage fish; for example, channel and blue catfish, yellow and black bullheads, mullet, gizzard shad, bowfin, spotted gar, carp, and small-mouth buffalo.

The average harvest for three 1-acre sites checked for fish population at Lake Verret, Bayou Sigur, and Grand Bayou was 200.8 pounds per acre of game, commercial, and forage fish. Lake Verret also produces a large crop of blue crabs, which are harvested for sport and commercial use.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 12, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and 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* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

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

*Grain and seed crops* are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, grain sorghum, wheat, oats, millet, cowpeas, soybeans, and sunflowers.

*Grasses and legumes* are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples are fescue, ryegrass, clover, and vetch.

*Wild herbaceous plants* are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples are bluestem, panicum, paspalum, fescue, and switchgrass.

*Hardwood trees* and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood

trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of native plants are oak, sweetgum, wild plum, hawthorn, dogwood, persimmon, sassafras, sumac, hickory, pecan, elm, blackberry, grape, bayberry, and greenbrier. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated good are shrub lespedeza, autumn-olive, and lespedeza.

*Wetland plants* are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer and wetness. Examples of wetland plants are smartweed, wild millet, rushes, sedges, common reed, spikerushes, and cattail.

*Shallow water areas* are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are wetness and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are waterfowl feeding ponds, wildlife watering developments, and other wildlife ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

*Openland habitat* 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 kinds of wildlife attracted to these areas include bobwhite quail, dove, meadowlark, field sparrow, killdeer, cottontail rabbit, red fox, and robins.

*Woodland habitat* consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Examples of wildlife attracted to this habitat are wild turkey, woodcock, woodpeckers, tree squirrels, fox, raccoon, and deer.

*Wetland habitat* consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. The kinds of wildlife attracted to this habitat are ducks, geese, herons, shore birds, rails, kingfishers, mink, and nutria.

## Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in

the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area.

## Engineering properties

Table 13 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 13 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

*Texture* is described in table 13 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 soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (Unified) (2) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (1).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two

classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging 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. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The estimated classification, without group index numbers, is given in table 13.

Percentage of the soil material that passes each of three sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

*Liquid limit* and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and *AASHTO* soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

## Physical and chemical properties

Table 14 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

*Permeability* is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

*Available water capacity* is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

*Soil reaction* is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

*Shrink-swell potential* depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

*Erosion factors* are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

## Soil series and morphology

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

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the *Soil Survey Manual* (12). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or map units, of each soil series are described in the section "Soil maps for detailed planning."

### Barbary series

The Barbary series consists of very poorly drained, very slowly permeable, semifluid soils in broad, low depressions in the eastern and western sides of the parish. The landscape is swamp. These soils formed in thin muck over clayey alluvium. Slope gradient is less than 0.2 percent. Elevation ranges from sea level to about 3 feet above sea level.

Barbary soils are geographically associated with Fausse and Sharkey soils. Both Fausse and Sharkey soils are at slightly higher elevations and have a B horizon with *N*-value of 0.7 or less. Sharkey soils also have vertic properties.

Typical pedon of Barbary muck in an area of Barbary association, 4.5 miles southwest of Labadieville, 420 feet north of Louisiana Highway 398, 35 feet east of an abandoned oil well road, NE1/4 sec 14, T. 15 S., R. 14 E.:

O2—6 to 0 inches; very dark brown (10YR 2/2) muck; massive; few wood fragments; flows easily between fingers when squeezed, leaving small residue; about 70 percent organic matter; slightly acid; clear wavy boundary.

A1—0 to 4 inches; dark gray (10YR 4/1) mucky clay; massive; flows easily between fingers when squeezed, leaving small residue; neutral; clear smooth boundary.

C1g—4 to 14 inches; gray (5Y 5/1) clay; massive; flows easily between fingers when squeezed, leaving medium residue; many live fibrous roots; few wood fragments; neutral; clear wavy boundary.

C2g—14 to 24 inches; dark greenish gray (5BG 4/1) clay; common medium distinct dark brown (10YR 3/3) mottles; massive; flows easily between fingers when squeezed, leaving small residue; few small tree limbs and larger tree trunks; mildly alkaline; gradual wavy boundary.

C3g—24 to 60 inches; greenish gray (5BG 5/1) clay; common medium distinct dark brown (10YR 3/3) mottles; massive; flows easily between fingers when squeezed, leaving medium to large residue; many logs and woody fragments; moderately alkaline.

Depth to firm layers is commonly greater than 60 inches. Woody fragments, buried logs, and stumps are typical in the C horizon. Reaction ranges from slightly acid to mildly alkaline in the O2 horizon, from neutral to mildly alkaline in the A horizon, and from neutral to moderately alkaline in the C horizon.

The O2 horizon is very dark gray, dark gray, dark brown, very dark brown, very dark grayish brown, or black muck or peat. The A horizon is very dark gray, dark gray, or dark grayish brown. It is clay or mucky clay. The C horizon is gray, dark gray, dark greenish gray, or greenish gray.

### Commerce series

The Commerce series consists of somewhat poorly drained, moderately slowly permeable soils on the high and intermediate parts of the natural levees of the Mississippi River distributaries throughout the parish. These soils formed in loamy alluvium. Slope gradient is less than 1 percent. Typically, these soils are at elevations more than 15 feet above sea level; however, elevation ranges to

less than 10 feet above sea level in the southern part of the parish.

Commerce soils are geographically associated with Sharkey and Tunica soils. Sharkey and Tunica soils occupy lower positions on the natural levees, have chroma of less than 2, have more clay in the upper horizons, and have vertic properties.

Typical pedon of Commerce silt loam, 2.5 miles northwest of Labadieville, 168 feet east of gravel road in center of fourth sugarcane field south of cane loading area, sec. 25, T. 14 S., R. 14 E.:

Ap1—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many remnants of sugarcane fiber; neutral; abrupt wavy boundary.

Ap2—8 to 12 inches; dark gray (10YR 4/1) silt loam; common medium faint dark yellowish brown (10YR 4/4) mottles; massive; firm; neutral; abrupt wavy boundary.

B21—12 to 18 inches; grayish brown (10YR 5/2) silty clay loam; common medium faint yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; firm; neutral; clear smooth boundary.

B22—18 to 31 inches; grayish brown (10YR 5/2) silty clay loam; common fine faint dark yellowish brown, yellowish brown, and gray mottles; weak medium subangular blocky structure; firm; few fine pores; moderately alkaline; clear wavy boundary.

C1g—31 to 49 inches; grayish brown (10YR 5/2) silty clay loam; many medium distinct dark brown (7.5YR 4/4) and common fine faint gray mottles; weak coarse subangular blocky structure; firm; few dark gray stains on vertical faces of peds; moderately alkaline; clear smooth boundary.

C2g—49 to 60 inches; gray (10YR 5/1) silty clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; massive; firm; moderately alkaline.

The solum ranges from 26 to 40 inches in thickness. Depth to clayey layers, where present, is typically greater than 50 inches. Reaction ranges from medium acid to mildly alkaline in the A horizon, from slightly acid to moderately alkaline in the B horizon, and from neutral to moderately alkaline in the C horizon.

The A horizon is dark gray, dark grayish brown, or grayish brown. Texture is silt loam or silty clay loam. Texture of the B horizon is silt loam, loam, or silty clay loam. It is grayish brown, dark grayish brown, or gray. The C horizon is stratified silt loam, silty clay loam, silty clay, or very fine sandy loam. The B and C horizons are mottled in shades of brown.

### Fausse series

The Fausse series consists of very poorly drained, very slowly permeable soils. These soils are adjacent to natural levees in broad, level depressions throughout the eastern and western sides of the parish. The landscape is swamp. The soils formed in clayey alluvium. Slope gradient is less than 0.5 percent. Typically, these soils are at elevations less than 5 feet above sea level.

Fausse soils are geographically associated with the Sharkey and Barbary soils. Sharkey soils occupy higher positions on the landscape and have vertic properties. Barbary soils occupy lower positions, are almost continuously flooded, have *N*-value of more than 0.7 below a depth of 8 inches, and do not have a B horizon.

Typical pedon of Fausse clay, in an area of Fausse association, 5 miles northwest of Paincourtville, 0.5 mile north of Pontoon Bridge on Louisiana Highway 70 at

Grand Bayou, 500 feet west of Louisiana Highway 69 behind abandoned oil tanks, SW1/4 sec. 34, T. 12 S., R. 13 E.:

- O1—1 to 0 inch; mat of live roots and stems, mostly water hyacinth; some woody material; abrupt smooth boundary.
- A1—0 to 12 inches; dark gray (5Y 4/1) clay; few fine faint olive brown mottles; weak coarse subangular blocky structure; firm; plastic, sticky; few wood fragments; neutral; gradual smooth boundary.
- B1g—12 to 28 inches; gray (5Y 5/1) clay; few fine distinct light olive brown mottles; weak very coarse prismatic structure; plastic, sticky; many wood fragments; moderately alkaline; clear smooth boundary.
- B22g—28 to 40 inches; gray (5Y 5/1) clay; common medium distinct dark yellowish brown (10YR 4/4) mottles; weak coarse subangular blocky structure; firm; plastic, sticky; pockets of dark greenish gray semifluid clay; few reddish brown stains in root channels; moderately alkaline; gradual smooth boundary.
- Cg—40 to 60 inches; gray (5Y 5/1) clay; common medium distinct dark yellowish brown (10YR 4/4) mottles; massive; firm; pockets of dark greenish gray semifluid clay that flows slowly between fingers when squeezed, leaving large amounts of residue; moderately alkaline.

The solum ranges from 25 to 46 inches in thickness. Organic surface horizons, where present, are less than 2 inches thick. Reaction ranges from medium acid through neutral in the A horizon and from neutral to moderately alkaline in the B and C horizons.

The A horizon is dark gray, dark grayish brown, very dark gray, or very dark grayish brown. Where the A horizon is very dark gray and very dark grayish brown, it is less than 8 inches thick. Texture is clay or mucky clay. The B and C horizons are gray, dark gray, greenish gray, or dark greenish gray and have mottles in shades of brown, red, and gray. Texture of the C horizon is clay, silty clay, or silty clay loam.

### Sharkey series

The Sharkey series consists of poorly drained, very slowly permeable soils. These soils are on the low and intermediate parts of the natural levees of the Mississippi River distributaries throughout the parish. They formed in clayey alluvium. Slope gradient is less than 1 percent. Most of these soils are at elevations ranging from 3 to 15 feet above sea level.

Sharkey soils are geographically associated with the Barbary, Commerce, Fausse, and Tunica soils. Barbary soils have an O horizon and *N*-value of more than 0.7. Commerce soils occupy higher positions on the natural levees, have a fine-silty control section, have chroma of more than 1, and do not have vertic properties. Fausse and Barbary soils do not have vertic properties and are on lower positions on the landscape.

Typical pedon of Sharkey clay, 6 miles south of Napoleonville, 420 feet north of Louisiana Highway 400 at junction with Louisiana Highway 1011, 60 feet west of ditch, SW part of Spanish Land Grant sec. 79, T. 14 S., R. 14 E.:

- Ap—0 to 13 inches; dark gray (10YR 4/1) clay; many remnants of sugarcane stalks; weak coarse subangular blocky structure; plastic; neutral; abrupt wavy boundary.
- B21g—13 to 25 inches; dark gray (10YR 4/1) clay; few fine faint dark yellowish brown mottles; weak coarse subangular blocky structure; very plastic; dark gray stains on walls of cracks and around roots; mildly alkaline; clear smooth boundary.
- B22g—25 to 38 inches; gray (N 5/0) clay; many medium distinct dark brown (7.5YR 4/4) mottles; weak coarse prismatic structure; plastic; moderately alkaline; clear smooth boundary.

B23g—38 to 53 inches; gray (5Y 5/1) clay; few fine faint dark yellowish brown mottles; weak coarse prismatic structure; firm; few short shear faces; moderately alkaline; clear smooth boundary.

IICg—53 to 60 inches; gray (10YR 5/1) silty clay loam; common medium faint yellowish brown (10YR 5/6) mottles; massive; firm; moderately alkaline.

The solum ranges from 36 to 60 inches in thickness. Reaction ranges from medium acid to moderately alkaline in the A and B horizons and from neutral to moderately alkaline in the C horizon.

The A horizon is dark gray, dark grayish brown, very dark gray, or very dark grayish brown. An A horizon that is very dark gray or very dark grayish brown is less than 10 inches thick. Mottles are in shades of brown. Texture is clay or silty clay loam. The B horizon is dark gray, gray, or olive gray and is mottled in shades of brown. The C horizon is dark gray, gray, grayish brown, or olive gray and has brownish or yellowish mottles. Texture is clay, silty clay loam, or silt loam.

### Tunica series

The Tunica series consists of poorly drained, very slowly permeable soils. These soils are on the low and intermediate parts of the natural levees of the Mississippi River distributaries throughout the parish. They formed in clayey over loamy alluvium. Slope gradient is less than 1 percent. These soils are mostly at elevations of 5 to 15 feet above sea level.

Tunica soils are geographically associated with Commerce and Sharkey soils. Commerce soils have a fine-silty control section and chroma of more than 1 in the upper horizons, and do not have vertic properties. Sharkey soils have a very fine control section.

Typical pedon of Tunica clay, 6,400 feet southeast of Belle Rose Post Office, 6,000 feet east of Louisiana Highway 308, 103 feet east of turnrow in middle of second cut of sugarcane south of secondary farm road, Spanish Land Grant sec. 87, T. 11 S., R. 14 E.:

- Ap1—0 to 4 inches; very dark grayish brown (10YR 3/2) silty clay; weak fine subangular blocky structure; firm; slightly acid; abrupt wavy boundary.
- Ap2—4 to 8 inches; dark gray (10YR 4/1) clay; massive; slightly plastic; neutral; clear wavy boundary.
- B21—8 to 20 inches; gray (10YR 5/1) clay; common fine faint dark yellowish brown mottles; weak medium subangular blocky structure; plastic; neutral; clear wavy boundary.
- B22g—20 to 25 inches; gray (10YR 5/1) silty clay; common fine faint olive brown mottles; weak coarse subangular blocky structure; firm; mildly alkaline; abrupt wavy boundary.
- IIC1g—25 to 60 inches; grayish brown (10YR 5/2) silt loam; common medium faint dark grayish brown (2.5Y 4/2) and yellowish brown (10YR 5/6) mottles; massive; firm; moderately alkaline.

The solum ranges from 20 to 36 inches in thickness. Depth to loamy layers is 20 to 36 inches. Reaction ranges from medium acid to mildly alkaline in the solum and from medium acid to moderately alkaline in the IIC horizon.

The A horizon is dark grayish brown, dark gray, and very dark grayish brown. Where the A horizon is very dark grayish brown, it is less than 6 inches thick. The B horizon is gray or dark gray clay or silty clay. The IIC horizon is gray, dark gray, dark grayish brown, or grayish brown fine sandy loam, loam, silty clay loam, or silt loam. The B and IIC horizons are mottled in shades of brown.

## Classification of the soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to "Soil taxonomy" (13).

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 15, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

**ORDER.** Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Entisol.

**SUBORDER.** Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to 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 expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Fluvaquents (*Fluv*, meaning flood plain deposits, plus *aquent*, the suborder of Entisols that have an aquic moisture regime).

**SUBGROUP.** Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. The adjective *Aeric* identifies a subgroup that is thought to be better drained than the *Typic* subgroup. An example is Aeric Fluvaquents.

**FAMILY.** Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties con-

sidered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine-silty, mixed, nonacid, thermic, Aeric Fluvaquents.

**SERIES.** The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

## Formation of the soils

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In this section the processes of soil formation are discussed and related to the soils in the survey area.

### Processes of soil formation

The processes of soil formation are those processes or events occurring in soils that influence the kind and degree of development of soil horizons. The rate and relative effectiveness of different processes is determined by the factors of soil formation: climate, living organisms, relief, parent material, and time.

Important soil forming processes include those that result in (1) additions of organic, mineral, and gaseous materials to the soil, (2) losses of these same materials from the soil, (3) translocation of materials from one point to another within the soil, and (4) physical and chemical transformation of mineral and organic materials within the soil (10). Typically, many processes take place simultaneously in soils. Examples in the survey area include accumulation of organic matter, development of soil structure, and leaching of bases from some soil horizons. The contribution of a particular process may change over a period of time. For example, installation of drainage and water control systems can change the length of time the soils are flooded or saturated with water. Some important processes that have contributed to the formation of the soils in Assumption Parish are discussed in the following paragraphs.

Organic matter has accumulated and undergone partial decomposition and incorporation in all the soils. Organic matter production is greatest in and above the surface horizon of the soil. This production results in the formation of soils in which the surface horizons are higher in organic matter content than the deeper horizons. The decomposition, incorporation, and mixing of organic residues into the soil horizons is brought about largely by

the activity of living organisms. Many of the more stable products of decomposition remain as finely divided materials that contribute dark color, increase available water and cation exchange capacities, contribute to granulation, and serve as a source of plant nutrients in the soil.

The addition of alluvial sediment at the surface has been important in the formation of the soils in the parish. Added sediment provides new parent material in which processes of soil formation then occur. In many cases, accumulation of new material has been at a faster rate than processes of soil formation could appreciably alter. The evident depositional strata in such soils as Commerce soils are a result of accumulation of this sort. Assimilation of sediment is also indicated by the contrasting textures in the Tunica soils and by thin lenses of silt loam or silty clay loam in lower horizons of some of the Sharkey soils.

Processes resulting in development of soil structure have taken place in all the soils. Plant roots and other organisms are effective agents in the rearrangement of soil material into secondary aggregates. Decomposed products or organic residues and secretions of organisms serve as cementing agents that help stabilize structural aggregates. Alternate wetting and drying and shrinking and swelling contribute to the development of structural aggregates and are particularly effective in soils that have appreciable amounts of clay, for example, the Sharkey soils.

The poorly drained and very poorly drained soils in the survey area have horizons in which reduction and segregation of iron, and perhaps manganese, compounds have been important processes. Reducing conditions prevail for long periods of time in these poorly aerated horizons. Consequently, the somewhat soluble reduced forms of iron and manganese are predominant over the less soluble oxidized forms. Reduced compounds of these elements can result in the gray colors that are characteristic of the Bg and Cg horizons in such soils as Sharkey and Fausse soils. In the more soluble reduced forms, appreciable amounts of iron and manganese may be removed from the soils or translocated from one position to another within the soil by water. The presence of browner mottles in predominantly gray horizons is indicative of segregation and local concentration of oxidized iron compounds as a result of alternating oxidizing and reducing conditions in the soils.

Loss of components has occurred to some extent during the formation of the soils. Water moving through the soil has leached soluble bases and any free carbonates that may have been initially present from some horizons of all soils that are not continuously flooded. None of the soils in the parish, however, is highly leached. In most places the soil is neutral or alkaline below a depth of 2 feet or less.

Secondary accumulations of calcium carbonate may be present in horizons below a depth of about 30 inches in some soils. Carbonates dissolved from overlying horizons may have been translocated to this depth by water and redeposited. Other sources and processes may contribute

in varying degrees to carbonate accumulation; for example, segregation of material within the horizons, upward translocation of material in solution from deeper horizons during fluctuations of water table levels, and contributions of material from such readily weatherable minerals as plagioclase.

## Factors of soil formation

A soil is a natural, three-dimensional body that formed on the earth's surface and that 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 the physical and chemical composition of the parent material; the climate during the formation of soil from the parent material; the kind of plants and other organisms living in the soil; the relief of the land and its effect on runoff and soil moisture conditions; and the length of time it took the soil to form.

The effect of a 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, it is recognized that many of the differences in soils cannot be attributed to differences in only one factor. For example, organic matter content in the soils in Assumption Parish is influenced by several factors, including relief, parent material, and living organisms. Such interactions do not preclude recognition of the manner in which a given factor may influence a specific soil property. In the following paragraphs the factors of soil formation are discussed as they relate to the soils in the survey area.

## Parent material

The parent material for mineral soils is the initial material from which the soils form. The soils mapped in Assumption Parish are mineral soils that developed in unconsolidated Mississippi River sediment of the natural levee and associated backswamp and flood basin deposits. The sediment was deposited during and since the time Bayou Lafourche served as a major channel of the Mississippi River. Saucier (9) indicates an age of less than about 5,000 years for the entire area.

Sediment carried by the Mississippi River is of varied origin and may have originated any place in the drainage area that extends from eastern Montana to western Pennsylvania. Sorting of sediment during deposition together with a diverse mineralogy results in marked differences in the parent material of soils developed in the alluvium. Mineralogical studies (11) of the alluvium indicate that smectite minerals are predominant in the clay-sized fraction, and secondary amounts of micaceous clays are also present. Associated with these materials are lesser amounts of kaolinite, chlorite-vermiculite intergrade, and quartz minerals. The sand- and silt-size fractions are made up largely of quartz but also include a

sizable amount of feldspar and smaller amounts of a variety of minerals, including such readily weatherable components as biotite and hornblende. Partial sorting of these materials occurs when the stream overflows and the initial decrease in velocity and transporting capability of the water results in rapid deposition of sediment. As the velocity of the water decreases, the initial deposit is high in sand. It is followed by sediment high in silt, which is followed by more clayey material. The clayey backswamp sediment is deposited from still or slowly moving water in low areas back of the natural levees. Consequently, the natural levees are highest and have the greatest sand content near the river. They characteristically have long, gentle slopes that extend away from the river. The Commerce and Sharkey soils, respectively, have developed in intermediate textured and fine-textured parent material. A number of differences in these soils can be attributed, wholly or in part, to differences in the parent material. For example, cation exchange capacity, organic matter content, and volume changes upon wetting and drying increase with increasing amounts of clay in the soils. Soil permeability, soil aeration, and content of readily weatherable minerals decrease with increasing clay content. Consequently, the silty Commerce soils are generally more productive for most crops and also provide the most desirable sites in the parish for most urban and industrial development.

The Fausse and Barbary soils developed in clayey deposits similar to the parent material of the Sharkey soils. The major differences among Fausse, Barbary, and Sharkey soils are due to factors other than parent material differences. The Tunica soils developed in areas where clayey alluvium less than 36 inches thick overlies loamy alluvium.

### Climate

Assumption Parish is in a region characterized by humid, subtropical climate. Discussion of this climate appears in this survey in the section "General nature of the parish." Because of the young age of the parent material, the soils in the parish have developed under climatic conditions similar to those of the present.

The climate is generally uniform throughout the parish; therefore local differences in the soils are not due to differences in atmospheric climate. Although the warm average temperatures and large amounts of precipitation favor a rapid rate of weathering of readily weatherable minerals in the soils, the soils are only slightly weathered because they have been exposed to weathering agents for a short period of time. Weathering and leaching, which have occurred to some extent in most soils, is indicated by soil reaction that is typically more alkaline in the lower horizons than in the upper horizons. Weathering processes which have resulted in the release and reduction of iron are shown in the gray Ag, Bg, or Cg horizons of the Fausse and Sharkey soils. Oxidation and segregation of iron, the result of alternating oxidizing and reduc-

ing conditions, is indicated by mottled horizons in the soils.

The effect of climate is also shown in the clayey soils that have large amounts of expanding-lattice minerals where large changes in volume occur upon wetting and drying. Wetting and drying cycles and associated volume changes are contributing factors in the formation and stabilization of structural aggregates in the soils. When wet soils dry out, cracks of variable width and depth may form as a result of decrease in volume. Climate influences the formation of these cracks and the depth and extent of cracking. Repeated large changes in volume frequently result in structural problems for buildings, roads, and other improvements on the soils. Formation of deep, wide cracks may shear roots of plants growing in the soil. If cracks are present, much of the water from rainfall or irrigation is infiltrated through the cracks, once the soil has become wet, however, infiltration rate becomes slow or very slow. Formation of cracks occurs extensively in the Sharkey and Tunica soils late in summer and early in fall when the soils are driest. At this time, cracks of an inch or more in width extending to a depth of more than 20 inches may form in most years. Cracks that are less extensive and less deep sometimes form in the more silty Commerce soils and in the clayey Fausse soils. The Fausse soils are dry to shallower depths than are the Sharkey soils and do not crack as deep. Cracks do not form in the continuously wet Barbary soils.

### Time

The kinds of horizons and their degree of development within a soil are influenced by the length of time of soil formation. Long periods of time are generally required for soils to form prominent horizons. In many areas, the length of time of soil formation for different soils may amount to several thousand years. In such areas large differences may exist among the soils that are due largely to the length of time in which the soil formed (3, 6).

The time of soil formation has been relatively short for the soils mapped in Assumption Parish. Saucier (9) indicates that the entire parish lies within recent Mississippi River Meander Belt and associated backswamp areas or flood basins, and that the age of deposits in the Meander Belt ranges from the most recent to as much as about 5,000 years. Consequently, the actual age or time of soil development may show similar variation for soils developed in this sediment.

Since the differences in time of soil formation are small, most differences among the soils in the parish are due largely to factors other than time; for example, parent material and relief. As a result of their young age, the soils reflect many characteristics of the parent material, as is shown by the evident bedding planes in the lower horizons of the Commerce soils, and in the distinct horizons of contrasting texture in the Tunica soils.

The influence of time on the characteristics of a particular soil is indicated by the kind and degree of develop-

ment of horizons that have formed. An accumulation of organic matter and the development of soil structure are features that are typically expressed in the early stages of development. The soils in Assumption Parish have distinct surface horizons that are generally darker in color and higher in organic matter content than horizons deeper in the profile. There is a wide range in the amounts of organic matter in the surface horizons, but these differences are due largely to differences in factors other than time. All the soils except Barbary soils have a B horizon that is characterized by subangular blocky structure. The clayey Barbary soils occupy low, submerged areas and have never air dried. As a result, they have not undergone the alternate wetting and drying or shrinking and swelling that contribute to the development of soil structure.

### Relief

Relief and other physiographic features influence soil formation processes mainly by affecting internal soil drainage, runoff, erosion and deposition, and exposure to the sun and wind. In Assumption Parish in the past, sediment has accumulated at a much faster rate than it has eroded away. This accumulation of sediment has been faster than the rate of many of the processes of soil formation, and is shown in the distinct stratification in lower horizons of some soils. Levee construction and other water control measures may have reversed this trend for such soils as the Commerce soils and perhaps others. Soil slope and rate of runoff, however, are low enough to prevent erosion from being a major problem in the parish.

The land surface of the parish is level or nearly level. With few exceptions, the soils have a slope of less than 1 percent. Slopes are as much as 3 percent in small areas adjacent to stream channels. Relief and the landscape position have had an important influence on formation of the different soils. Characteristically, the slopes are long and extend from the highest elevation on natural levees along Bayou Lafourche to an elevation that is several feet lower in the backswamp areas. Differences in the clayey Sharkey, Fausse, and Barbary soils illustrate the influence of relief on the soils in the parish. Barbary soils are in the lowest, ponded backswamp area; Sharkey soils are predominantly at higher elevation in the backswamp and on lower parts of the natural levees; and Fausse soils occupy positions intermediate between Barbary and Sharkey soils. These soils at lower elevation have higher organic matter content, are more poorly drained, have a thinner solum, and form cracks to shallower depths in dry periods than do the clayey soils at higher elevation.

The predominant soils from the highest to the lowest elevation are typically the Commerce, Sharkey, Fausse, and Barbary soils. The general soil map shows that the map units are generally in a similar pattern along either side of Bayou Lafourche. Soils at lower elevation receive runoff from those at higher elevation, and the water table is nearer the surface for longer periods of time in the

soils at lower elevation. Some important topographic and drainage characteristics of the soils are shown in table 16. Differences in the organic matter content of the soils are related to relief. Organic matter content generally increases as internal soil drainage becomes more restricted. Such soils as the Commerce soils, in the higher and better drained positions on the landscape, have an environment in which more extensive oxidation of organic matter takes place. The very poorly drained Fausse soils are ponded for extended periods. This ponding results in a more limited environment and in a much greater accumulation of organic matter.

The relief factor in the parish is somewhat unique because the soils are on a low-lying, slowly subsiding landmass. Howe and associates (5) and others (8) indicate that the overall area is very slowly decreasing in elevation. Present elevation ranges from sea level to a maximum of approximately 23 feet. This subsidence can be attributed partly to the continued accumulation in the Gulf of Mexico of sediment from the Mississippi River and other lesser sources. The added weight of this sediment results in a continuous downwarping of the adjoining landmass. This process causes a general lowering of the landmass and an increase in the regional gulfward slope. In addition, post-depositional sediment compaction may result in some subsidence, and local deposition of sediment may contribute to similar but more localized changes.

Some possible effects of subsidence on soils are readily apparent. For example, some soils formerly not subject to flooding are now intermittently flooded. Others that were subject to flooding are now flooded more frequently and are covered with deeper water for longer periods of time. Consequently, some soils are more poorly drained at present than they were in the recent past. Cultural features and practices, vegetation patterns, and soil characteristics all provide evidence of the effects of subsidence within the parish. Abandonment or rerouting of roads has been necessary in some low areas where once usable roads are now permanently covered with water. In other areas, farmstead buildings have been abandoned and are now flooded for periods of 3 months or longer. Continuous retreat of sugarcane culture from some low areas can be documented by comparing a sequence of aerial photographs of the parish.

The increased depth, duration, and frequency of flooding has had a marked effect on woodland vegetation in some places. The less water tolerant trees have been replaced by species that are more suited to wetter soil conditions. In the low lying areas a typical soil distribution pattern shows the very poorly drained Barbary soils in the lowest and wettest areas, the very poorly drained Fausse soils in slightly higher and less wet areas, and the poorly drained Sharkey soils in higher positions. A typical distribution of woodland vegetation across the Sharkey-Fausse-Barbary soils is oak, hickory, and sweetgum on the Sharkey soils; dead or dying oak, hickory, and sweet-

gum together with young baldcypress, water tupelo, and pumpkin ash in areas of Fausse soils adjacent to the Sharkey soils; and older baldcypress, water tupelo, and pumpkin ash at greater distances apart within areas of Fausse soils and on Barbary soils. This sequence reflects a distribution of vegetation that is increasingly tolerant of saturated soil conditions. Increased flooding of established oak, hickory, and sweetgum results in the disappearance of these species from the stand and the establishment of such trees as baldcypress and water tupelo that are more tolerant of a saturated soil condition. Figure 6 shows a typical landscape of the Fausse soils in a flooded area where this change in species is taking place.

Several differences in soils across the Sharkey-Fausse-Barbary boundaries can be related to relief and the associated differences in flooding and drainage. The development of firm soil layers and of mottles having colors redder than the soil matrix apparently requires nonflooded conditions or surface conditions in which drying or limited oxidation can take place. Typically, depth to semifluid layers decreases from greater than 6 feet in areas of Sharkey soils adjacent to Fausse soils to less than 8 inches in areas of Barbary soils adjacent to Fausse soils. The development and depth of occurrence of mottles are similar across these areas. Mottles redder than the soil matrix are characteristic of Sharkey soils but are not present in Fausse and Barbary soils in all areas. In areas where the reddish mottles are present in all three soils, the lowest depth of occurrence typically decreases in this order: Sharkey, Fausse, and Barbary soils. Buried soils that have firm horizons and reddish mottles are beneath layers of semifluid clays in several low areas in the parish. At one time, these buried soils were exposed at the surface but are now at depths where drying does not take place.

### Living organisms

Living organisms affect the process of soil formation in a number of ways and exert a major influence on the kind and extent of horizons that develop. Porosity, structure, and incorporation of organic matter are influenced by the growth of plants and activity of other organisms that physically disturb the soil. Photosynthesis of plants, utilizing energy from the sun to synthesize compounds necessary for growth; produces additional organic matter. Growth and the eventual decomposition of plants provides for recycling of

nutrients from the soil and serves as a major source of organic residue. Decomposition and incorporation of organic matter by micro-organisms enhances the development of structure and generally increases the infiltration rate and available water capacity in soils. Relatively stable organic compounds in soils generally have very high cation exchange capacities. These compounds increase the capacity of the soil to absorb and store such nutrients 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. Consequently, large differences in soils may result in areas that have widely contrasting numbers of plants and other organisms.

The native vegetation in Assumption Parish consists mainly of southern hardwood forests and associated understory and ground cover. Cottonwood, sycamore, and hackberry are predominant on the higher and better drained Commerce soils. Oak, sweetgum, and green ash are predominant on the clayey, poorly drained Sharkey soils. The major native trees on the clayey, very poorly drained Fausse and Barbary soils are baldcypress, water tupelo, and pumpkin ash.

Differences in the amount of organic matter that has accumulated in and on the soils are greatly influenced by the kinds and quantities of micro-organisms. Aerobic organisms utilize oxygen from the air and are chiefly responsible for organic matter decomposition through rapid oxidation of organic residue. These organisms are most abundant and prevail for longer periods in such better drained and better aerated soils as Commerce soils. In the most poorly drained soils, anaerobic organisms are predominant throughout most or all of the year. Anaerobic organisms do not require oxygen from the air, and they decompose organic residues very slowly. Differences in decomposition by micro-organisms can result in large accumulations of organic matter in such poorly drained soils as Barbary, while in such better drained soils as Commerce, the accumulation is much less.

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## Glossary

**Alluvial plain** (geologic). The deposited stream-borne material built up on the valley bottoms to form an alluvial plain extending from valley wall to valley wall. The major alluvial plain in Assumption Parish is the Mississippi River alluvial plain.

**Alluvium**. Material, such as sand, silt, or clay, deposited on land by streams.

**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.

**Compressible**. Excessive decrease in volume of soft soil under load.

**Corrosive**. High risk of corrosion to uncoated steel or deterioration of concrete.

**Drainage class** (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening

of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

**Excessively drained**.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

**Somewhat excessively drained**.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

**Well drained**.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

**Moderately well drained**.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

**Somewhat poorly drained**.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

**Poorly drained**.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

**Very poorly drained**.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

**Excess fines**. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

**Fertility, soil**. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**Low strength**. Inadequate strength for supporting loads.

**Natural levee**. A low ridgelike deposit immediately adjacent to the stream channel. It forms from the coarser and heavier material carried by floodwater and deposited when the velocity of the water

was checked as it left the river channel and spread over the flood plain. The height of the levee generally indicates the difference in stage (level between ordinary floods and low water. The average levee is slightly more than a mile wide and less than 15 feet high. It slopes downward from the river's edge to the backswamp areas at an average of 3 or 4 feet per mile.

**Percs slowly.** The slow movement of water through the soil adversely affecting the specified use.

**Permeability.** The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

**pH value.** (See Reaction, soil). A numerical designation of acidity and alkalinity in 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 a semisolid to a plastic state.

**Poor outlets.** Surface or subsurface drainage outlets difficult or expensive to install.

**Reaction, soil.** The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	<i>pH</i>
Extremely acid .....	Below 4.5
Very strongly acid.....	4.5 to 5.0
Strongly acid.....	5.1 to 5.5
Medium acid .....	5.6 to 6.0
Slightly acid .....	6.1 to 6.5
Neutral .....	6.6 to 7.3
Mildly alkaline .....	7.4 to 7.8
Moderately alkaline.....	7.9 to 8.4
Strongly alkaline .....	8.5 to 9.0
Very strongly alkaline .....	9.1 and higher

**Series, soil.** A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

**Shrink-swell.** The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Slow intake.** The slow movement of water into the soil.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

## **Illustrations**

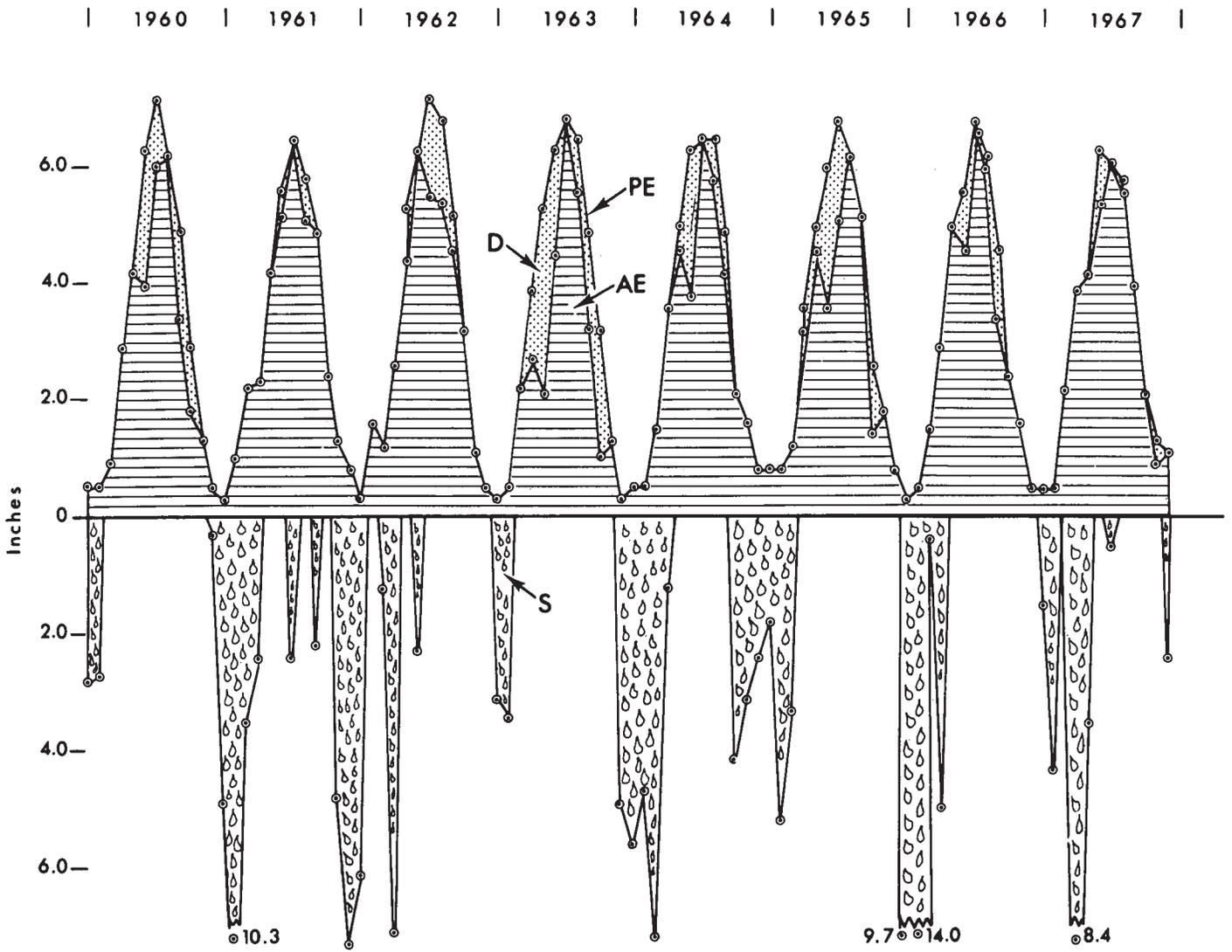


Figure 1.—Water budget data for Assumption Parish.

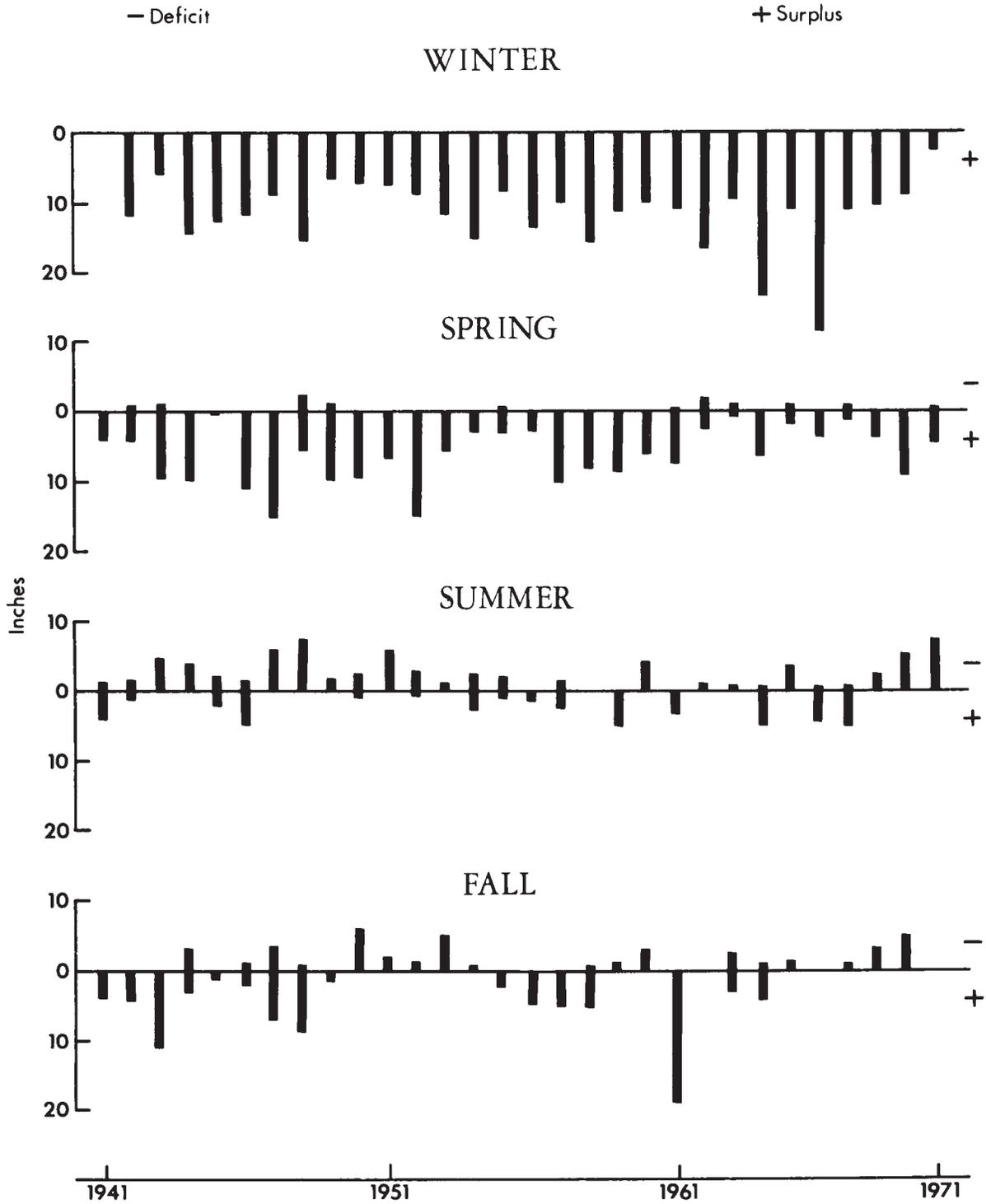


Figure 2.—Frequency of monthly surpluses and deficits in the water budget.



*Figure 3.*—Typical landscape in the Barbary unit. Baldcypress, water tupelo, black willow, and pumpkin ash trees are in the background, and water hyacinth is covering the surface of the water in the foreground.



*Figure 4.*—Harvesting sugarcane on Commerce silt loam. Sugarcane is the main crop in the parish.



*Figure 5.*—Young sugarcane on Commerce silty clay loam. The sugar mill in the background will process the crop after harvest. Sugarcane is the main crop on this soil.



*Figure 6.*—Landscape of Fausse association. Subsidence and the resulting increased flooding are causing the oak, hickory, and sweetgum trees to die. Seedlings of baldcypress, water tupelo, pumpkin ash, and black willow are now becoming established.



*Figure 7.*—Sugarcane produces a large amount of residue after harvest. This residue is important in maintaining organic-matter content.

## **Tables**

## SOIL SURVEY

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA  
 [Recorded during the period 1941-70 at Donaldsonville]

Month	Temperature						Precipitation		
	Average daily maximum	Average daily minimum	Extreme maximum	Extreme minimum	2 years in 10 will have--		Average	1 year in 10 will have--	
					Maximum higher than--	Minimum lower than--		Less than--	More than--
°F	°F	°F	°F	°F	°F	°F	In	In	In
January----	65	42	87	11	82	23	4.7	1.7	7.8
February---	68	45	87	17	84	27	5.1	1.5	10.0
March-----	74	50	94	25	87	31	5.2	2.1	8.9
April-----	82	58	96	34	92	42	4.2	1.4	7.3
May-----	88	64	97	42	95	50	5.6	2.2	8.2
June-----	92	70	102	54	99	60	4.3	1.1	9.0
July-----	93	72	101	59	99	66	7.0	2.9	11.4
August-----	93	72	101	60	98	63	5.7	2.8	8.1
September--	90	68	99	45	97	56	5.8	1.3	9.3
October----	83	58	98	26	92	40	2.7	0.4	5.0
November---	73	48	90	21	85	28	4.4	0.6	9.6
December---	67	44	85	10	82	23	5.7	3.2	8.7
Year-----	--	--	--	--	--	--	60.3	47.1	69.3

TABLE 2.--FREEZE DATES IN SPRING AND FALL  
 [All data from Donaldsonville, Ascension Parish]

Probability	Minimum temperature		
	24° F or lower	28° F or lower	32° F or lower
Spring:			
1 year in 10 later than--	January 29	March 6	March 25
2 years in 10 later than--	January 24	February 25	March 16
5 years in 10 later than--	January 14	February 6	February 24
Fall:			
1 year in 10 earlier than--	December 15	November 28	November 3
2 years in 10 earlier than--	December 18	December 5	November 12
5 years in 10 earlier than--	December 24	December 18	November 24

TABLE 3. --POTENTIALS AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP FOR SPECIFIED USES

Map unit	Extent of area	Cultivated farm crops	Urban uses	Intensive recreation areas	Pastureland
1. Barbary	Pct 38	Very poor: permanent high water table, poor traffic supporting capacity, almost continuous flooding.	Very poor: permanent high water table, almost continuous flooding, very poor engineering characteristics.	Very poor: low elevations, permanent high water table, almost continuous flooding, poor traffic supporting capacity.	Very poor: permanent high water table, poor traffic supporting capacity, almost continuous flooding.
2. Commerce	29	Excellent: high fertility, wide choice of crops, high yields, may need drainage, suited to multi-row equipment.	Fair: seasonal high water table, little or no probability of flooding within 100 years, fair engineering characteristics.	Fair: wetness, seasonal high water table, suited for water impoundments, easy to work.	Excellent: high fertility, wide choice of plants, drainage generally not needed, lime generally not needed.
3. Sharkey	11	Good: high fertility, moderate to high yields, needs drainage, fairly wide choice of crops, suited to multi-row equipment, difficult to work and prepare seedbed, surface layers stay wet for long periods.	Poor: seasonal high water table, some probability of flooding within 100 years, poor engineering characteristics.	Poor: seasonal high water table, too clayey, high shrink-swell potential, well suited for water impoundments.	Good: high fertility, needs drainage, fairly wide choice of plants, lime generally not needed.
4. Fausse-Sharkey	22	Very poor: subject to frequent flooding, permanent high water table in the low areas.	Very poor: subject to frequent flooding, poor engineering characteristics.	Very poor: subject to frequent flooding, poor traffic supporting capacity, well suited for water impoundments.	Very poor: subject to frequent flooding, poor traffic supporting capacity, narrow choice of plants.

TABLE 4. --ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
BA	Barbary association	75,638	34.0
Cc	Commerce silt loam	31,179	14.0
Cm	Commerce silty clay loam	25,914	11.7
FA	Fausse association	39,339	17.7
SA	Sharkey silty clay loam	10,067	4.5
Sh	Sharkey clay	14,223	6.4
Sk	Sharkey clay, frequently flooded	15,850	7.1
Tu	Tunica clay	2,932	1.3
	Water	7,100	3.3
	Total	222,242	100.0

## SOIL SURVEY

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields in columns N are for nonirrigated soils; those in columns I are for irrigated soils. All yields were estimated for a high level of management in 1976. Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil name and map symbol	Sugarcane		Soybeans		Rice	Common bermudagrass	
	<u>N</u> Ton	<u>I</u> Ton	<u>N</u> Bu	<u>I</u> Bu	<u>I</u> Bu	<u>N</u> AUM*	<u>I</u> AUM*
BA** Barbary	---	---	---	---	---	---	---
Cc Commerce	35	---	40	---	---	8.0	---
Cm Commerce	35	---	40	---	---	7.5	---
FA** Fausse	---	---	---	---	---	---	---
Sa, Sh Sharkey	30	---	35	---	130	6.5	---
Sk Sharkey	---	---	---	---	---	5.0	---
Tu Tunica	32	---	35	---	120	6.5	---

\* 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 a period of 30 days.

\*\* See map unit description for the composition and behavior of the map unit.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry in a column means the information was not available. Site index was calculated at age 30 for eastern cottonwood, at age 35 for American sycamore, and at age 50 for all other species]

Soil name and map symbol	Woodland suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Important trees	Site index	
BA*----- Barbary	4w6	Slight	Severe	Severe	Baldcypress----- Water tupelo----- Black willow----- Pumpkin ash-----	--- 60 --- ---	Baldcypress.
Cc, Cm----- Commerce	1w5	Slight	Moderate	Slight	Green ash----- Eastern cottonwood-- Nuttall oak----- Water oak----- Pecan----- American sycamore---	80 120 90 110 --- ---	Eastern cottonwood, American sycamore.
FA*----- Fausse	4w6	Slight	Severe	Severe	Green ash----- Baldcypress----- Water hickory----- Water tupelo----- Pumpkin ash-----	70 --- --- --- ---	Baldcypress.
Sa, Sh----- Sharkey	2w6	Slight	Severe	Moderate	Green ash----- Eastern cottonwood-- Cherrybark oak----- Sweetgum----- Water oak----- Pecan----- American sycamore---	85 100 90 90 --- --- ---	Eastern cottonwood, American sycamore.
Sk----- Sharkey	3w6	Slight	Severe	Severe	Green ash----- Eastern cottonwood-- Water oak----- Water hickory-----	70 90 80 ---	Eastern cottonwood.
Tu----- Tunica	2w6	Slight	Severe	Moderate	Cherrybark oak----- Eastern cottonwood-- Green ash----- Nuttall oak----- Sweetgum-----	90 105 100 105 90	American sycamore, eastern cottonwood.

\* See map unit description for the composition and behavior of the map unit.

## SOIL SURVEY

TABLE 7.--BUILDING SITE DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets
BA*----- Barbary	Severe: floods, wetness, too clayey.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.
Cc, Cm----- Commerce	Severe: wetness.	Moderate: wetness, low strength, shrink-swell.	Moderate: wetness, low strength, shrink-swell.	Moderate: wetness, low strength, shrink-swell.
FA*----- Fausse	Severe: floods, too clayey, wetness.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.
Sa, Sh----- Sharkey	Severe: wetness, too clayey.	Severe: wetness, low strength, shrink-swell.	Severe: wetness, low strength, shrink-swell.	Severe: wetness, low strength, shrink-swell.
Sk----- Sharkey	Severe: floods, wetness, too clayey.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.
Tu----- Tunica	Severe: too clayey, wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, corrosive.	Severe: shrink-swell, wetness.

\* See map unit description for the composition and behavior of the map unit.

TABLE 8.--SANITARY FACILITIES

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BA*----- Barbary	Severe: floods, wetness, percs slowly.	Severe: floods, excess humus.	Severe: floods, too clayey, wetness.	Severe: floods, wetness.	Poor: wetness, too clayey.
Cc, Cm----- Commerce	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey.
FA*----- Fausse	Severe: floods, percs slowly, wetness.	Severe: floods.	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Poor: too clayey, wetness.
Sa, Sh----- Sharkey	Severe: wetness, percs slowly.	Slight-----	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, wetness.
Sk----- Sharkey	Severe: floods, wetness, percs slowly.	Severe: floods.	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Poor: too clayey, wetness.
Tu----- Tunica	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: too clayey, wetness.

\* See map unit description for the composition and behavior of the map unit.

TABLE 9.--CONSTRUCTION MATERIALS

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," and "unsuited." Absence of an entry means soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BA*----- Barbary	Poor: wetness, low strength, shrink-swell.	Unsuited: excess fines, excess humus.	Unsuited: excess fines, excess humus.	Poor: excess humus, wetness.
Cc----- Commerce	Fair: low strength, shrink-swell, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Cm----- Commerce	Fair: low strength, shrink-swell, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
FA*----- Fausse	Poor: wetness, low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.
Sa, Sh, Sk----- Sharkey	Poor: low strength, shrink-swell, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, too clayey.
Tu----- Tunica	Poor: shrink-swell, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.

\* See map unit description for the composition and behavior of the map unit.

TABLE 10.--WATER MANAGEMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Grassed waterways
BA* Barbary	Slight-----	Severe: low strength, compressible, shrink-swell.	Floods, percs slowly.	Not needed-----	Not needed.
Cc Commerce	Moderate: seepage.	Slight-----	Favorable-----	Favorable-----	Favorable.
Cm Commerce	Moderate: seepage.	Slight-----	Favorable-----	Slow intake-----	Favorable.
FA* Fausse	Slight-----	Moderate: shrink-swell, compressible, low strength.	Floods, percs slowly, poor outlets.	Floods, percs slowly, wetness.	Not needed.
Sa, Sh Sharkey	Slight-----	Moderate: low strength, compressible, shrink-swell.	Percs slowly-----	Percs slowly, slow intake, wetness.	Wetness.
Sk Sharkey	Slight-----	Moderate: low strength, compressible, shrink-swell.	Floods, percs slowly.	Floods, percs slowly.	Wetness.
Tu Tunica	Moderate: seepage.	Moderate: shrink-swell, compressible.	Wetness, percs slowly.	Slow intake, wetness.	Percs slowly, wetness.

\* See map unit description for the composition and behavior of the map unit.

TABLE 11.--RECREATIONAL DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
BA*----- Barbary	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness, percs slowly.	Severe: floods, wetness, percs slowly.
Cc----- Commerce	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Cm----- Commerce	Moderate: too clayey, percs slowly.	Moderate: wetness, too clayey.	Moderate: wetness, too clayey.	Moderate: wetness, too clayey.
FA*----- Fausse	Severe: floods, wetness, too clayey.	Severe: floods, wetness, too clayey.	Severe: floods, wetness, too clayey.	Severe: floods, wetness, too clayey.
Sa, Sh----- Sharkey	Severe: too clayey, percs slowly, wetness.	Severe: too clayey, wetness.	Severe: too clayey, percs slowly, wetness.	Severe: too clayey, wetness.
Sk----- Sharkey	Severe: floods, too clayey, percs slowly.	Severe: floods, too clayey, wetness.	Severe: floods, too clayey, percs slowly.	Severe: floods, too clayey, wetness.
Tu----- Tunica	Severe: wetness, too clayey, percs slowly.	Severe: wetness, too clayey.	Severe: wetness, percs slowly, too clayey.	Severe: wetness, too clayey.

\* See map unit description for the composition and behavior of the map unit.

TABLE 12.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates the soil was not rated]

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
BA*----- Barbary	Very poor	Very poor	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Fair.
Cc, Cm----- Commerce	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
FA*----- Fausse	Very poor	Very poor	Very poor	Poor	Good	Good	Very poor	Poor	Good.
Sa, Sh----- Sharkey	Fair	Fair	Fair	Good	Good	Good	Fair	Good	Good.
Sk----- Sharkey	Poor	Fair	Fair	Good	Fair	Fair	Poor	Fair	Fair.
Tu----- Tunica	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

\* See map unit description for the composition and behavior of the map unit.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol &lt; means less than; &gt; means greater than. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--			Liquid limit  Pct	Plas- ticity index
			Unified	AASHTO	10	40	200		
	<u>In</u>								
BA*----- Barbary	6-0	Muck, peat-----	Pt	A-8	---	---	---	---	---
	0-4	Mucky clay, clay	OH	A-7-5, A-8	100	100	95-100	70-90	35-45
	4-60	Clay-----	MH	A-7-5	100	100	95-100	70-90	35-45
Cc----- Commerce	0-12	Silt loam-----	CL-ML, CL, ML	A-4	100	100	75-100	<30	NP-10
	12-31	Silty clay loam, silt loam, loam.	CL	A-6, A-7-6	100	100	85-100	32-45	11-23
	31-60	Stratified very fine sandy loam to silty clay.	CL-ML, CL, ML	A-4, A-6, A-7-6	100	100	75-100	23-45	3-23
Cm----- Commerce	0-12	Silty clay loam	CL	A-6, A-7-6	100	100	90-100	32-50	11-25
	12-35	Silty clay loam, silt loam, loam.	CL	A-6, A-7-6	100	100	85-100	32-45	11-23
	35-60	Stratified very fine sandy loam to silty clay.	CL-ML, CL, ML	A-4, A-6, A-7-6	100	100	75-100	23-45	3-23
FA*----- Fausse	0-12	Mucky clay, clay	CH, OH, MH	A-7-6, A-7-5	100	100	95-100	60-100	30-65
	12-40	Clay-----	CH, MH	A-7-6, A-7-5	100	100	95-100	60-105	30-73
	40-60	Clay, silty clay, silty clay loam.	CH, MH, CL, ML	A-7-6, A-7-5	100	100	95-100	45-105	15-73
Sa----- Sharkey	0-10	Silty clay loam	CL	A-6, A-7-6	100	100	95-100	32-50	11-25
	10-43	Clay-----	CH	A-7-6	100	100	95-100	56-85	30-50
	43-60	Clay, silty clay loam, silt loam.	CL-ML, CL, CH	A-4, A-6, A-7-6	100	100	95-100	25-85	5-50
Sh----- Sharkey	0-13	Clay-----	CH, CL	A-7-6	100	100	95-100	46-85	22-50
	13-53	Clay-----	CH	A-7-6	100	100	95-100	56-85	30-50
	53-60	Clay, silty clay loam, silt loam.	CL-ML, CL, CH	A-4, A-6, A-7-6	100	100	95-100	25-85	5-50
Sk----- Sharkey	0-5	Clay-----	CH, CL	A-7-6	100	100	95-100	46-85	22-50
	5-50	Clay-----	CH	A-7-6	100	100	95-100	56-85	30-50
	50-60	Clay, silty clay loam, silt loam.	CL-ML, CL, CH	A-4, A-6, A-7-6	100	100	95-100	25-85	5-50
Tu----- Tunica	0-8	Clay-----	CH	A-7	98-100	95-100	90-100	50-92	25-62
	8-25	Clay, silty clay	CH	A-7	98-100	95-100	90-100	50-92	25-62
	25-60	Fine sandy loam, loam, silty clay loam.	ML, CL-ML, CL	A-4, A-6	95-100	65-100	51-100	<40	NP-20

\* See map unit description for the composition and behavior of the map unit.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means greater than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
BA*----- Barbary	6-0 0-4 4-60	>2.0 <0.06 <0.06	>.20 0.18-0.20 0.18-0.20	6.1-7.8 6.6-7.8 6.6-8.4	Low----- Very high----- Very high-----	--- 0.37 0.37	---
Cc----- Commerce	0-12 12-31 31-60	0.6-2.0 0.2-0.6 0.2-2.0	0.21-0.23 0.20-0.22 0.20-0.23	5.6-7.8 6.1-8.4 6.6-8.4	Low----- Moderate----- Low-----	0.37 0.32 0.37	5
Cm----- Commerce	0-12 12-35 35-60	0.2-0.6 0.2-0.6 0.2-2.0	0.20-0.22 0.20-0.22 0.20-0.23	5.6-7.8 6.1-8.4 6.6-8.4	Moderate----- Moderate----- Low-----	0.32 0.32 0.37	5
FA*----- Fausse	0-12 12-40 40-60	<0.06 <0.06 <0.2	0.18-0.20 0.18-0.20 0.18-0.22	5.6-7.3 6.6-8.4 6.6-8.4	Very high----- Very high----- Very high-----	0.20 0.24 0.24	5
Sa----- Sharkey	0-10 10-43 43-60	0.2-0.6 <0.06 0.06-0.2	0.20-0.22 0.18-0.20 0.18-0.22	5.6-8.4 5.6-8.4 6.6-8.4	Moderate----- Very high----- Very high-----	0.37 0.28 0.28	5
Sh----- Sharkey	0-13 13-53 53-60	<0.06 <0.06 0.06-0.2	0.18-0.20 0.18-0.20 0.18-0.22	5.6-8.4 5.6-8.4 6.6-8.4	Very high----- Very high----- Very high-----	0.24 0.28 0.28	5
Sk----- Sharkey	0-5 5-50 50-60	<0.06 <0.06 0.06-0.2	0.18-0.20 0.18-0.20 0.18-0.22	5.6-8.4 5.6-8.4 6.6-8.4	Very high----- Very high----- Very high-----	0.24 0.28 0.28	5
Tu----- Tunica	0-8 8-25 25-60	<0.06 <0.06 0.06-2.0	0.15-0.20 0.15-0.20 0.10-0.22	5.6-7.8 5.6-7.8 5.6-8.4	High----- High----- Low-----	0.32 0.32 0.32	3

\* See map unit description for the composition and behavior of the map unit.

## SOIL SURVEY

TABLE 15.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Barbary-----	Very-fine, montmorillonitic, nonacid, thermic Typic Hydraquents
Commerce-----	Fine-silty, mixed, nonacid, thermic Aeric Fluvaquents
Fausse-----	Very-fine, montmorillonitic, nonacid, thermic Typic Fluvaquents
Sharkey-----	Very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Tunica-----	Clayey over loamy, montmorillonitic, nonacid, thermic Vertic Haplaquepts

TABLE 16.--RELATIONSHIPS BETWEEN SOILS AND TOPOGRAPHY, RUNOFF, DRAINAGE, AND WATER TABLE

Soil series	Topography	Runoff	Internal drainage class	Seasonal high water table	
				Depth	Duration
				<u>Feet</u>	
Barbary-----	Level and depressional.	Ponded-----	Very poorly drained.	+1.0-0.5	Jan.-Dec.
Commerce-----	Nearly level---	Medium and slow-	Somewhat poorly drained.	1.5-2.5	Dec.-Apr.
Fausse-----	Level and depressional.	Very slow and ponded.	Very poorly drained.	+0.5-1.5	Jan.-Dec.
Sharkey-----	Level and nearly level.	Slow-----	Poorly drained--	1.5-3.0	Dec.-Apr.

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