United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Texas Agricultural Experiment Station

Soil Survey of Hardin County, Texas

How To Use This Soil Survey

General Soil Map

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

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

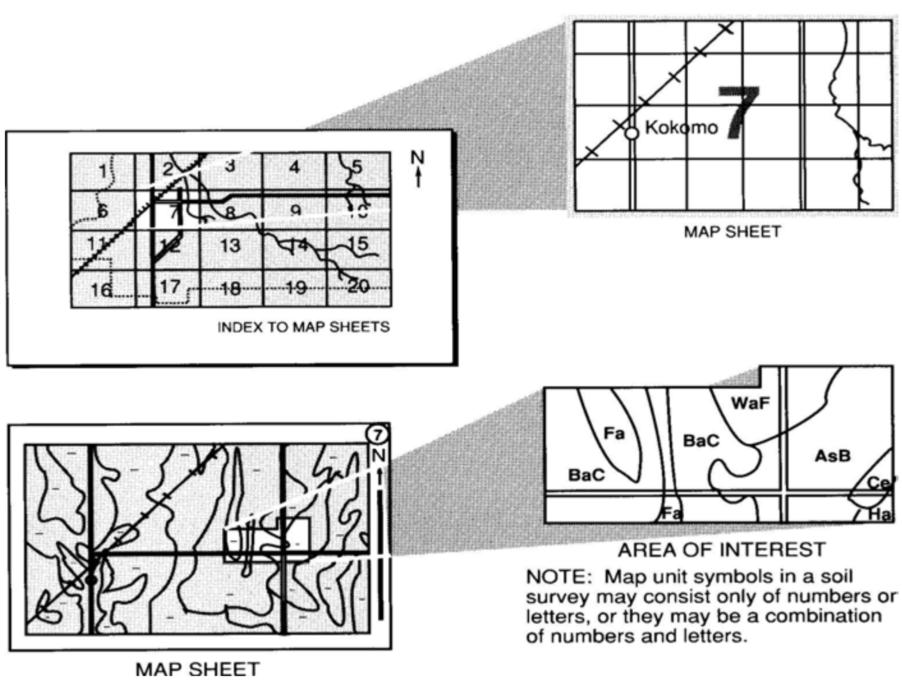
Detailed Soil Maps

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

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

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

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



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

Major fieldwork for this soil survey was completed in 1996. Soil names and descriptions were approved in 1998. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1998. This survey was made cooperatively by the Natural Resources Conservation Service and the Texas Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Lower Neches Soil and Water Conservation District.

Cover: Wildlife habitat in an area of Cypress mucky clay, 0 to 1 percent slopes, frequently flooded.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is http://www.nrcs.usda.gov

Contents

How to Use This Survey ... i
Foreword ... vii
General Nature of the County ... 1
History and Settlement ... 1
Agriculture ... 2
Natural Resources ... 3
Climate ... 3
How This Survey Was Made ... 4
General Soil Map Units ... 7
Soils on the Flatwoods ... 7
1. Dallardsville-Sorter-Plank ... 7
2. Kirbyville-Waller-Otanya ... 8
3. Evadale-Vamont-Texla ... 9
Soils on the Coast Prairie ... 9
4. Aris-League-Labelle ... 10
Soils on the Flood Plains and Terraces ... 10
5. Belrose-Votaw-Caneyhead ... 11
6. Estes-Angelina-Spurger ... 12
7. Belrose-Bleakwood-Iulus ... 12
Detailed Soil Map Units ... 15
AnA—Anahuac-Aris complex, 0 to 1 percent slopes ... 16
ArA—Aris-Levac complex, 0 to 1 percent slopes ... 18
AsA—Aris-Spindletop complex, 0 to 1 percent slopes ... 20
BaA—Batson very fine sandy loam, 0 to 1 percent slopes ... 22
BeA—Beaumont clay, 0 to 1 percent slopes ... 24
BoB—Belrose loamy very fine sand, 1 to 3 percent slopes ... 26
BrA—Belrose-Caneyhead complex, 0 to 1 percent slopes ... 28
BvA—Bevil clay, 0 to 1 percent slopes ... 30
CaA—Camptown silt loam, 0 to 1 percent slopes ... 31
CbA—Camptown-Batson complex, 0 to 1 percent slopes ... 32
CyA—Cypress mucky clay, 0 to 1 percent slopes, frequently flooded ... 34
DAM—Dam ... 35
EsA—Estes clay, 0 to 1 percent slopes, frequently flooded ... 35
EtA—Estes-Angelina complex, 0 to 1 percent slopes, frequently flooded ... 37
EvA—Evadale silt loam, 0 to 1 percent slopes ... 39
EwA—Evadale-Gist complex, 0 to 1 percent slopes ... 40
ExA—Evadale-Texla complex, 0 to 1 percent slopes ... 42
IbA—Iulus-Bleakwood complex, 0 to 1 percent slopes, frequently flooded ... 43
JaA—Jasco silt loam, 0 to 1 percent slopes ... 45
JhA—Jayhawker silt loam, 0 to 1 percent slopes ... 46
KeB—Kenefick fine sandy loam, 1 to 3 percent slopes ... 48
KfA—Kenefick-Caneyhead complex, 0 to 1 percent slopes ... 49
KrB—Kirbyville very fine sandy loam, 0 to 2 percent slopes ... 51

KwA—Kirbyville-Niwana complex, 0 to 1 percent slopes 53
KzB—Kountze very fine sandy loam, 0 to 2 percent slopes 55
LdA—Labelle-Levac complex, 0 to 1 percent slopes 56
LsA—Labelle-Spindletop complex, 0 to 1 percent slopes 58
LtA—League clay, 0 to 1 percent slopes 60
LvA—Lelavale loam, 0 to 1 percent slopes 62
LwA—Leton silt loam, 0 to 1 percent slopes.. 63
MaA—Manco loam, 0 to 1 percent slopes, frequently flooded 64
McC—McNeely sand, 1 to 5 percent slopes.. 66
NdA—Nona-Dallardsville complex, 0 to 1 percent slopes 67
Oa—Oil-waste land 69
OeA—Olive silt loam, 0 to 1 percent slopes 69
OvA—Olive-Dallardsville, 0 to 1 percent slopes 71
OyB—Otanya fine sandy loam, 1 to 3 percent slopes 73
OyC—Otanya fine sandy loam, 3 to 5 percent slopes 74
PkA—Plank silt loam, 0 to 1 percent slopes 76
SbC—Silsbee fine sandy loam, 3 to 5 percent slopes 77
SbD—Silsbee fine sandy loam, 5 to 12 percent slopes 79
SdA—Sorter-Dallardsville complex, 0 to 1 percent slopes 80
SpB—Spurger very fine sandy loam, 0 to 2 percent slopes 83
TuB—Turkey sand, 1 to 3 percent slopes 84
TyA—Tyden-Babco complex, 0 to 1 percent slopes 86
VaA—Vamont clay, 0 to 1 percent slopes 88
VoA—Votaw fine sand, 0 to 1 percent slopes 89
W—Water 91
WdA—Waller-Dallardsville complex, 0 to 1 percent slopes..................... 91
Use and Management of the Soils 95
Crops and Pasture 95
Yields Per Acre.. 98
Land Capability Classification 98
Prime Farmland 99
Woodland..100
Woodland Groups...100
Forest Management and Productivity 107
Forest Management...107
Forest Productivity 108
Woodland Understory Vegetation...109
Recreation...109
Wildlife Habitat 111
Hydric Soils 113
Engineering...113
Building Site Development 114
Sanitary Facilities...115
Construction Materials 117
Water Management 118
Soil Properties 121
Engineering Index Properties..121
Physical Soil Properties...122
Chemical Soil Properties 124
Water Features 125
Soil Features...126
Physical and Chemical Analyses of Selected Soils 126
Classification of the Soils...129
Soil Series and Their Morphology 129

Anahuac Series 130
Angelina Series 131
Aris Series 132
Babco Series 134
Batson Series 136
Beaumont Series 138
Belrose Series 139
Bevil Series 142
Bleakwood Series 143
Camptown Series 144
Caneyhead Series 146
Cypress Series 148
Dallardsville Series 149
Estes Series 152
Evadale Series 153
Gist Series 155
Iulus Series 156
Jasco Series 157
Jayhawker Series 159
Kenefick Series 161
Kirbyville Series 163
Kountze Series 166
Labelle Series 168
League Series 169
Lelavale Series 170
Leton Series 172
Levac Series 176
Manco Series 177
McNeely Series 177
Niwana Series 178
Nona Series 180
Olive Series 182
Otanya Series 184
Plank Series 186
Silsbee Series 189
Sorter Series 191
Spindletop Series 194
Spurger Series 195
Texla Series 197
Turkey Series 199
Tyden Series 200
Vamont Series 203
Votaw Series 204
Waller Series 206
Formation of the Soils 209
Factors of Soil Formation 209
Parent Material 209
Climate 209
Plant and Animal Life 210
Relief 210
Time 210
Processes of Horizon Differentiation 210
Surface Geology 212
Lissie Formation 212

Beaumont Formation 212
Deweyville Formation and Other Fluviatile Terrace Deposits 213
Holocene Alluvium 213
References 215
Glossary 217
Tables 233
Table 1.—Temperature and Precipitation....................234
Table 2.—Freeze Dates in Spring and Fall 235
Table 3.—Growing Season....................235
Table 4.—Acreage and Proportionate Extent of the Soils....................236
Table 5.—Land Capability and Yields per Acre of Crops and Pasture ...237
Table 6.—Prime Farmland....................241
Table 7.—Woodland Management and Productivity....................242
Table 8.—Recreational Development 249
Table 9.—Wildlife Habitat 254
Table 10.—Building Site Development....................259
Table 11.—Sanitary Facilities 266
Table 12.—Construction Materials....................272
Table 13.—Water Management....................277
Table 14.—Engineering Index Properties....................286
Table 15.—Physical Properties of the Soils 307
Table 16.—Chemical Properties of the Soils....................318
Table 17.—Water Features 325
Table 18.—Soil Features....................340
Table 19.—Physical Analyses of Selected Soils....................343
Table 20.—Chemical Analyses of Selected Soils....................348
Table 21.—Classification of the Soils....................353

September 2006

Foreword

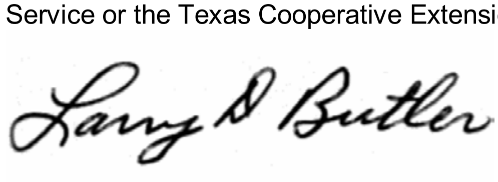
This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

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

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

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

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



Larry D. Butler
State Conservationist
Natural Resources Conservation Service

Soil Survey of Hardin County, Texas

By
Jonathan K. Wiedenfeld, Natural Resources Conservation Service

Fieldwork by

Gerald W. Crenwelge, Ricky E. Lambert, Dennis K. Mulligan, and Jonathan K. Wiedenfeld, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
In cooperation with
Texas Agricultural Experiment Station

Hardin County is in southeastern Texas (fig. 1). It has a total area of 898 square miles, or 575,002 acres. Kountze is the county seat. Other towns include Lumberton, Rose Hill Acres, Silsbee, and Sour Lake. In 1990, Lumberton was the largest town, with a population of 6,640. In 1990, the population of Hardin County was 45,932.

The land surface is gently sloping in the northern part bounded by an area from Silsbee on the eastern side to Votaw on the western side and becomes nearly level in the southern part in the vicinity of Sour Lake. Elevations range from about 175 feet above sea level in the northwestern part to 15 feet above sea level in the southeastern part along the Neches River.

The major drainage system in Hardin County is the Neches River in the eastern part. Village Creek in the central part and Pine Island Bayou in the western part are major tributaries of the Neches River.

Hardin County is in two major land resource areas (MLRA's) (16). About three-fourths of the county lies within the Western Gulf Coast Flatwoods MLRA and about one-fourth of the county lies within the Gulf Coast Prairie MLRA. The Western Gulf Coast Flatwoods MLRA has mostly light colored loamy and silty soils that formed under pine forest vegetation. The Gulf Coast Prairie MLRA has mostly dark colored loamy and clayey soils that formed under prairie vegetation.

The major land use in Hardin County is woodland. About 85 percent of the county is used as woodland and wildlife habitat, and 15 percent is used as pasture.

General Nature of the County

This section provides general information about Hardin County. It describes history and settlement, agriculture, natural resources, and climate.

History and Settlement

This section was based on the book," The History of Hardin County, Texas," by Robert L. Schaadt. (12)

Hardin County was organized in 1858 from parts of the adjacent Liberty, Jefferson, and Tyler Counties. It was named in honor of the Hardin family of Liberty.

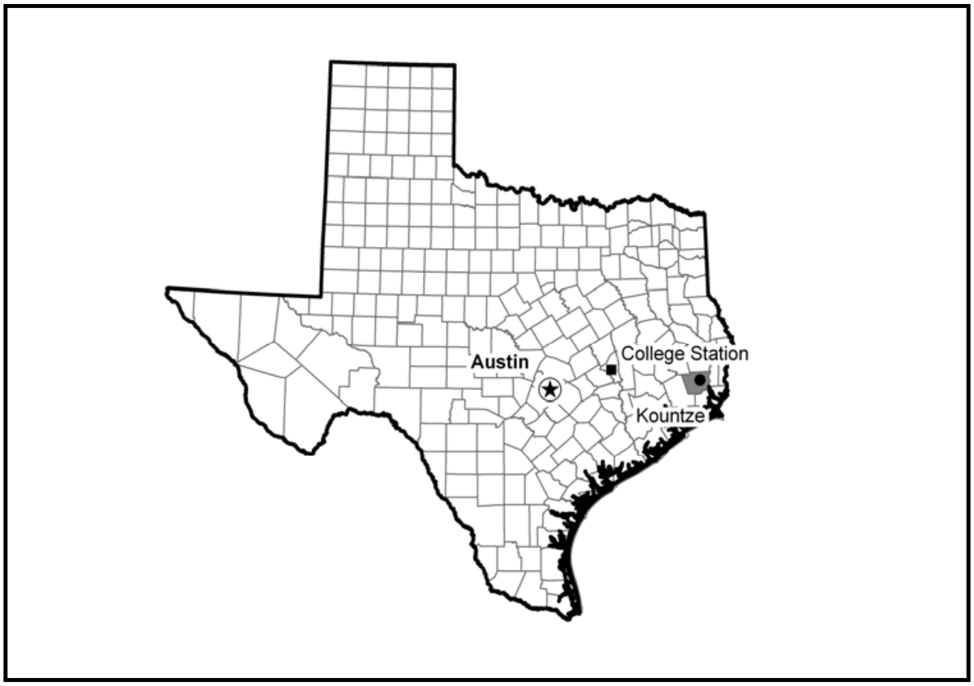


Figure 1.—Location of Hardin County, Texas.

Indian tribes were part of the survey area long before exploration by Europeans. The Kadohadacho and Bidai tribes occupied the northern part of the county while the Attacapa and Karankawa tribes settled in the south. These tribes probably did not inhabit the area permanently but used the area for hunting and food gathering.

The first Europeans to explore this part of Texas were the Spanish and French. In 1519, the Spanish made this area of Southeast Texas part of their empire. However, the Spanish were not active colonizers. By the early 1700s, French and English traders were dealing with the Indians regularly.

Settlement into the Hardin County area was virtually nonexistent in the first half of the 1800s. A census taken in 1826 indicated only 407 people inhabited this area of southeast Texas. During this period, the Neches River served the area as a primary avenue for commerce and transportation. With the coming of the railroad in the 1880's, Hardin County had an increasing influx of settlers.

From the latter half of the 1800s to the early 1900s, the county saw steady growth. People were attracted to the area by the many jobs provided by the timber and oil industry.

At one time, mineral waters near Sour Lake were considered to have medicinal value. The establishment of spas attracted people from all over the world and helped the economy of Hardin County for many years.

Agriculture

The production of timber is the primary agricultural enterprise of Hardin County. The production of livestock, hay, and truck and row crops are minor.

About 85 percent of the county is woodland, of which 329,802 acres are owned by timber companies. These companies provide county residents a source for employment and recreation from logging and milling to hunting and fishing. Along with the large commercial companies, many small timber companies operate in the county.

Although farming and ranching is not a major industry today, they provide a second source of income for many. Most livestock operations are cow-calf operations and the production of hay and pasture support this industry. With Hardin County’s evenly distributed yearly rainfall, the production of hay often exceeds the amount used. The excess hay is shipped and sold outside the county.

The cultivation of crops is decreasing throughout the county. A small acreage near Sour Lake is planted to rice and some acreage is planted to truck crops near Batson. Blueberry orchards are increasing and may become a viable agricultural industry in the future.

Natural Resources

The most important natural resources in Hardin County are soil, water, wildlife, petroleum, timber, and natural gas. Soil is critical for the production of crops, hay, livestock, and timber, which are main sources of income in the county. Sand mined along the terraces of the Neches River and soils from the coastal plains are mainly used for road and building construction.

Extensive amounts of timber are found throughout the county and represent the largest source of income for the county. Most of the soils throughout the county have the potential for pine or hardwood production.

Water is abundant in the numerous small lakes, ponds, creeks, and rivers in the county. The high rainfall that is evenly distributed throughout the year provides ample supply of water for most domestic uses.

Oil and gas is produced in nearly all parts of the county. The leases for oil and gas production have provided the county and its landowners a source of added income.

Climate

Hardin County summers are hot and humid. Winters are warm and are occasionally interrupted by incursions of cold air from the north. Rainfall is uniformly distributed throughout the year with a slight peak in spring and fall. During the summer months, the area is subject to tropical storms or hurricanes. When these occur, strong winds accompanied with high rainfall is expected.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Liberty, Texas, in the period 1971 to 2000. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is about 53 degrees F and the average daily minimum temperature is 42 degrees. The lowest temperature on record, which occurred at Liberty on December 24, 1989, is 7 degrees. In summer, the average temperature is about 82 degrees and the average daily maximum temperature is 92 degrees. The highest temperature, which occurred at Liberty on July 20, 1913, is 108 degrees.

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

The average annual total precipitation is about 60 inches. Of this, about 51 inches, or 84 percent, usually falls in February through November. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 18.50 inches at Liberty on November 18, 1994. Thunderstorms occur on about 67 days each year, and most occur in July.

The average seasonal snowfall is 0.2 inches. The greatest snow depth at any one time during the period of record was 3 inches recorded on January 12, 1973. The heaviest 1-day snowfall on record was 9.0 inches recorded on February 13, 1960.

The average relative humidity in mid-afternoon is about 64 percent. Humidity is higher at night, and the average at dawn is about 89 percent. The sun shines 66 percent of the time in summer and 47 percent in winter. The prevailing wind is from the south. Average wind speed is highest, 11.1 miles per hour, in February, March, and April. Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from the weather station at Beaumont, Texas.

How This Survey Was Made

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

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

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

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

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

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

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

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

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

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

Soils on the Flatwoods

These soils make up 69 percent of the county. Soils on the Flatwoods formed in loamy and clayey sediments of the Lissie and Beaumont Formations. Most of the landscape is nearly level with many areas having low mounds, flats, and depressions.

These soils are used mainly for timber production. Loblolly pine and slash pine are the major species. Some areas are used as pasture and hayland and are well suited to these uses. The most common limitation is wetness that affects the machinery used for planting and harvesting. The wetness also is a major limitation affecting some urban uses.

1. Dallardsville-Sorter-Plank

Nearly level, moderately well drained and poorly drained, slowly permeable, loamy soils

This map unit makes up about 30 percent of the county. It is about 42 percent Dallardsville soils, 38 percent Sorter soils, 17 percent Plank soils, and 3 percent other soils (fig. 2).

This map unit typically is on broad, smooth, nearly level areas that have poorly defined drainage patterns that generally flow southeastward toward the Neches River. Slopes are typically less than 1 percent. Vegetation consists of mixed hardwood and pine forest with a dense understory. The underlying materials are loamy sediments of the Lissie Formation.

Dallardsville soils are on circular to oblong mounds. Sorter soils are on intermound areas in complex with Dallardsville soils. Plank soils are on broad, flat areas.

Of minor extent in this map unit are Jayhawker, Kirbyville, Kountze, Otanya, and Waller soils. Jayhawker soils are on positions similar to or slightly lower than those of the Plank soils. Kirbyville soils are on rises on flats. Kountze soils are on nearly level and very gently sloping broad ridges. Otanya soils are on backslope and shoulder positions.

This map unit is used mainly for timber production. The principal commercial trees are loblolly pine and slash pine. Trees grow well on those soils that have good internal drainage but wetness is a limitation on those soils without good internal drainage.

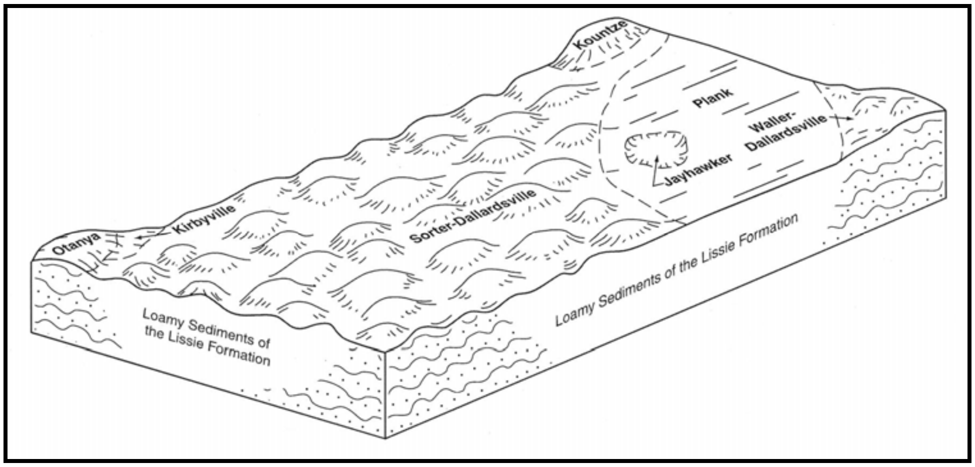


Figure 2.—Pattern of soils and underlying material in the Dallardsville-Sorter-Plank general soil map unit.

Some areas are used as pasture and hayland. Bahiagrass is the principal grass. Applications of fertilizer and lime are needed for maximum forage production.

These soils are poorly suited to urban uses because of wetness and low strength.

2. Kirbyville-Waller-Otanya

Nearly level to gently sloping, well drained to poorly drained, moderately permeable, moderately slowly and slowly permeable, loamy soils

This map unit makes up about 24 percent of the county. It is about 34 percent Kirbyville soils, 34 percent Waller soils, 27 percent Otanya soils, and 5 percent other soils (fig 3).

This map unit typically is on broad, smooth, nearly level to gently sloping areas that have poorly defined drainage patterns that generally flow southeastward toward the Neches River. Slopes are typically 0 to 2 percent, but some areas have slopes up to 12 percent. Vegetation consists of mixed hardwood and pine forest with a dense understory. The underlying materials are loamy sediments of the Lissie Formation.

Kirbyville soils are on rises on flats. Waller soils are on intermound areas in complex with Dallardsville soils. Otanya soils are on hill backslope and shoulder positions.

Of minor extent in this map unit are Dallardsville, Jayhawker, Kountze, Plank, Silsbee, and Sorter soils. Dallardsville soils are on mounds. Kountze soils are on nearly level and very gently sloping broad ridges. Jayhawker and Plank soils are on broad nearly level flat areas. Silsbee soils are on hill backslope and shoulder positions. Sorter soils are on positions similar to those of the Waller soils.

This map unit is used mainly for timber production. The principal commercial trees are loblolly pine and slash pine. Trees grow well on those soils that have good internal drainage, but wetness is a limitation on those soils without good internal drainage.

Some areas are used as pasture and hayland. Bahiagrass is the principal grass. Applications of fertilizer and lime are needed for maximum forage production.

These soils are well suited to urban uses in areas of good internal drainage but poorly suited in areas of poor internal drainage because of wetness and low strength.

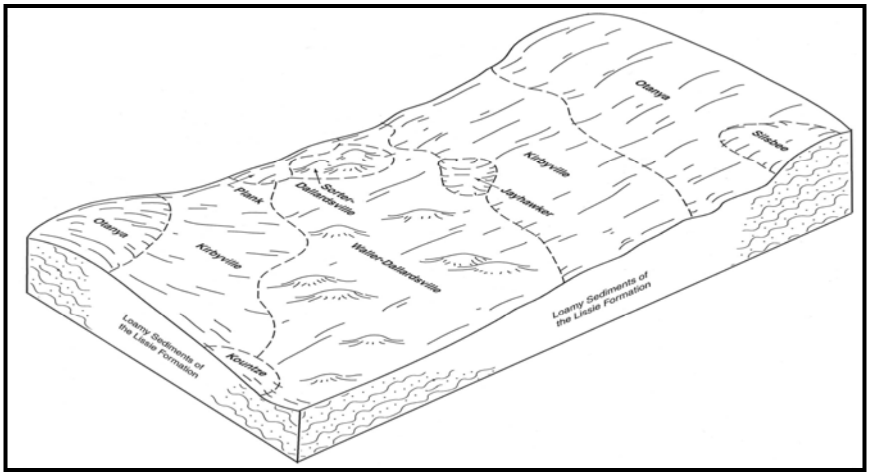


Figure 3.—Pattern of soils and underlying material in the Kirbyville-Waller-Otanya general soil map unit.

3. Evadale-Vamont-Texla

Nearly level, somewhat poorly drained and poorly drained, very slowly permeable, loamy and clayey soils

This map unit makes up about 15 percent of the county. It is about 44 percent Evadale soils, 26 percent Vamont soils, 23 percent Texla soils, and 7 percent other soils (fig. 4).

This map unit typically is on broad, smooth, nearly level areas that have poorly defined drainage patterns that generally flow southeastward toward the Neches River. Slopes are typically less than 1 percent. Vegetation consists of mixed hardwood and pine forest. The underlying materials are clayey sediments of the Beaumont Formation.

Evadale soils are on broad nearly level areas or on intermound areas in complex with other soils.

Vamont soils are on broad, flat areas. Texla soils are on oblong mounds in complex with the Evadale soils.

Of minor extent in this map unit are Batson, Bevil, Camptown, and Gist soils. Batson soils are broad ridges. Bevil and Camptown soils are in slightly depressional areas. Gist soils are circular mounds in complex with Evadale soils.

This map unit is used mainly for timber production. The principal commercial trees are loblolly pine and slash pine. Trees grow well on those soils that have good internal drainage, but wetness is a limitation on those soils without good internal drainage.

Some areas are used as pasture and hayland. Bahiagrass is the principal grass. Applications of fertilizer and lime are needed for maximum forage production.

These soils are poorly suited to urban uses because of wetness and high shrink-swell.

Soils on the Coast Prairie

These soils make up 9 percent of the county. Soils on the Coast Prairie formed in loamy and clayey sediments of the Beaumont Formation. Most of the landscape is nearly level with many areas having low mounds, flats, and depressions.

These soils are used mainly for pasture and hayland production and are well suited to these uses. Some areas are used for timber production. Loblolly pine and slash pine are

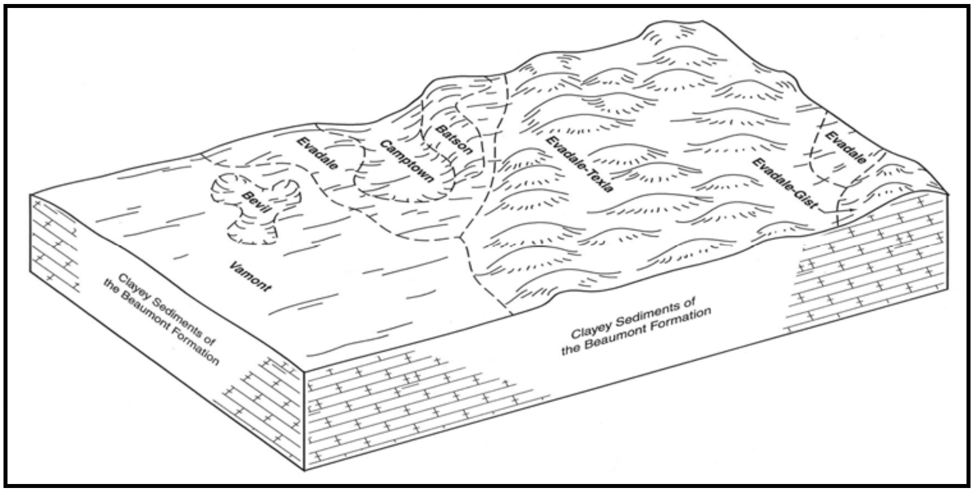


Figure 4.—Pattern of soils and underlying material in the Evadale-Vamont-Texla general soil map unit.

the major species. The most common limitation is wetness that affects the machinery used for planting and harvesting. The wetness and high shrink-swell are major limitations affecting some urban uses.

4. Aris-League-Labelle

Nearly level, somewhat poorly drained and poorly drained, very slowly permeable, loamy and clayey soils

This map unit makes up about 9 percent of the county. It is about 40 percent Aris soils, 28 percent League soils, 22 percent Labelle soils, and 10 percent other soils (fig. 5).

This map unit typically is on broad, smooth, nearly level areas that have poorly defined drainage patterns that generally flow southeastward toward the Neches River. Slopes are typically less than 1 percent. Vegetation consists of grassland and mixed hardwood. A few areas have pine. The underlying materials are clayey sediments of the Beaumont Formation.

Aris soils are on intermound areas in complex with Spindletop soils. League soils are on broad, flat areas. Labelle soils are on intermound areas in complex with other soils.

Of minor extent in this map unit are Anahuac, Beaumont, Leton, Spindletop, and Levac soils. Anahuac soils are on ridges. Beaumont and Leton soils are in slightly depressional areas. Spindletop soils are circular mounds in complex with Aris or Labelle soils. Levac soils are truncated mounds and are in complex with Aris or Labelle soils.

This map unit is used mainly for pasture and hayland production and is well suited to these uses. Applications of fertilizer and lime are needed for maximum forage production.

Bahiagrass is the principal grass. Some areas are used for timber production and as cropland. The principal commercial trees are loblolly pine and slash pine. Rice is the principal crop with some acreage planted to vegetables.

These soils are poorly suited to urban uses because of wetness and high shrink-swell.

Soils on the Flood Plains and Terraces

These soils make up about 21 percent of the county and include all the soils along the flood plains and the adjacent terraces. The flood plain soils formed in loamy or clayey

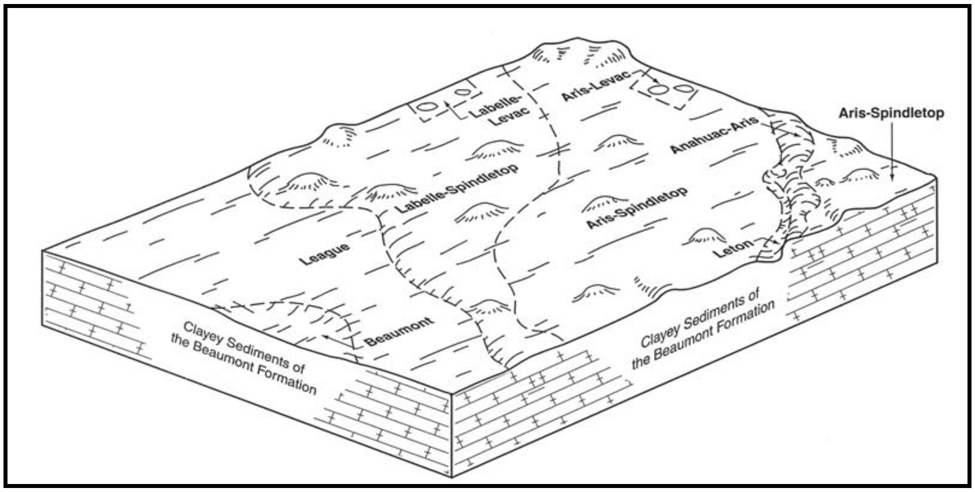


Figure 5.—Pattern of soils and underlying material in the Aris-League-Labelle general soils map unit.

alluvium of Holocene age and the terraces formed in loamy or sandy alluvium of late Pleistocene age.

The areas along the Neches River, Turkey Creek, Village Creek, Beech Creek, and Pine Island Bayou represent the major flood plains and terrace systems. Slopes along the flood plain are less than 1 percent, and the terraces are dominantly 0 to 2 percent with few areas up to 5 percent.

Hardwoods are the dominant trees along the flood plains. A pine and hardwood mix is the principal vegetation along the terraces. Some areas on the terraces are used as pasture and hayland.

Most areas along the flood plains are frequently flooded and some areas on the terraces are ponded for long periods. These are the major limitations for all land uses.

5. Belrose-Votaw-Caneyhead

Nearly level and very gently sloping, moderately well drained to very poorly drained, moderately rapid to slowly permeable, loamy and sandy soils

This map unit makes up about 12 percent of the county. It is about 50 percent Belrose soils, 21 percent Votaw soils, 18 percent Caneyhead soils, and 11 percent other soils.

This map unit typically is on broad, smooth, nearly level areas that have poorly defined drainage patterns that generally flow southeastward toward the Neches River. Slopes are typically 0 to 2 percent, but some areas have slopes up to 3 percent. Vegetation consists of mixed hardwood and pine forest with a dense understory. The underlying materials are loamy sediments of late Pleistocene age.

Belrose soils are on a river valley terrace riser position. Votaw soils are on a river valley terrace riser position. Caneyhead soils are on a river valley terrace tread position.

Of minor extent in this map unit are Cypress, Kenefick, Spurger, Turkey, and McNeely soils. Cypress soils are in abandoned channels and oxbows. Kenefick, McNeely, Spurger, and Turkey soils are on river valley terrace risers.

This map unit is used mainly for timber production. The principal commercial trees are loblolly pine and slash pine. Trees grow well on those soils that have good internal drainage, but wetness is a limitation on those soils without good internal drainage.

Some areas are used as pasture and hayland. Bahiagrass is the principal grass. Applications of fertilizer and lime are needed for maximum forage production.

These soils are well suited to urban uses in areas of good internal drainage, but poorly suited in areas of poor internal drainage because of wetness and low strength.

6. Estes-Angelina-Spurger

Nearly level and very gently sloping, moderately well drained to very poorly drained, slowly permeable and very slowly permeable, loamy and clayey soils

This map unit makes up about 5 percent of the county. It is about 43 percent Estes soils, 35 percent Angelina soils, 12 percent Spurger soils, and 10 percent other soils (fig. 6).

This map unit typically is on broad, smooth, nearly level and very gently sloping flood plains and the adjacent terrace. Slopes are typically 0 to 1 percent, but some areas have slopes up to 2 percent. Vegetation consists of mixed hardwood and pine forest with a dense understory. The underlying materials are loamy and clayey alluviums of late Pleistocene and Holocene age.

Estes soils are on broad flood plains. Angelina soils are in sloughs. Spurger soils are on a river valley terrace riser adjacent to the flood plains.

Of minor extent in this map unit are Belrose, Cypress, Kenefick, and Votaw soils. Belrose and Kenefick are on a river valley terrace riser similar to Spurger soils. Cypress soils are in abandoned channels and oxbows. Votaw soils are on broad flat river valley terrace risers adjacent to the flood plain.

These areas are used almost exclusively for recreation purposes and are not suited to commercial timber production or urban uses because of flooding.

7. Belrose-Bleakwood-Iulus

Nearly level and very gently sloping, moderately well drained to poorly drained, moderately permeable, loamy soils

This map unit makes up about 4 percent of the county. It is about 34 percent Belrose soils, 30 percent Bleakwood soils, 26 percent Iulus soils, and 10 percent other soils.

This map unit typically is on nearly level flood plains and the adjacent terrace along creeks. These areas generally flow southeastward toward the Neches River. Slopes are typically 0 to 1 percent, but some areas have slopes up to 3 percent. Vegetation consists of mixed hardwood and pine forest with a dense understory. The underlying materials are loamy sediments of late Pleistocene age and Holocene age.

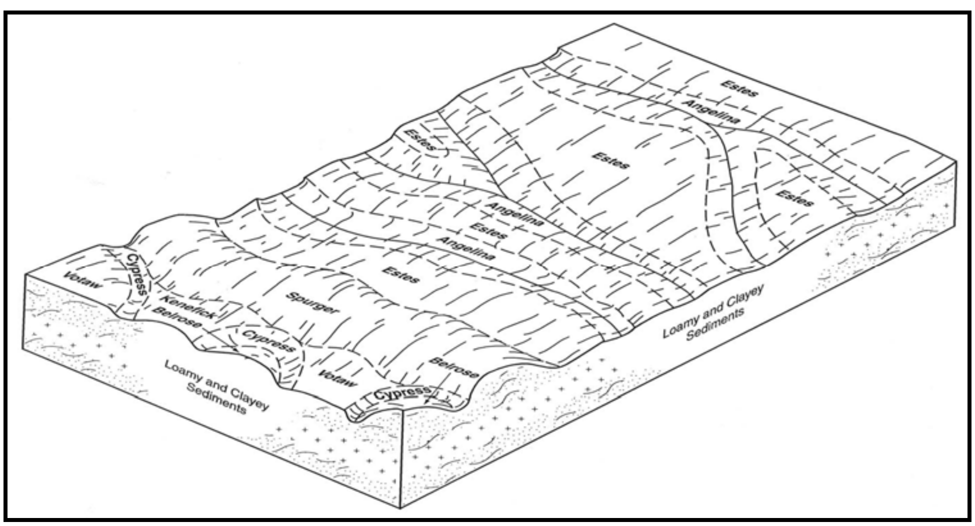


Figure 6.—Pattern of soils and underlying material in the Estes-Angelina-Spurger general soil map unit.

Belrose soils are on a river valley terrace riser. Bleakwood soils are in flood plain channels. Iulus soils are on natural levees.

Of minor extent in this map unit are Babco, Kenefick, Manco, McNeely, Spurger, Turkey, and Tyden soils. Babco soils are on a river valley terrace riser similar to the position of the Belrose soils. Manco soils are on flood plains in slightly higher positions than those of the Bleakwood soils. Kenefick and Spurger soils are on river valley terrace risers similar to the position of the Belrose soils. Turkey and McNeely soils are on river valley terrace risers on higher positions than the Belrose soils. Tyden soils are in river valley sloughs.

This map unit is used mainly for wildlife habitat. Some areas are used for commercial timber. The principal commercial trees are loblolly pine and slash pine

Flooding is the most limiting factor for all land uses.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

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

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

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

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Otanya fine sandy loam, 3 to 5 percent slopes, is a phase of the Otanya series.

Some map units are made up of two or more major soils. These map units are complexes. A soil *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Sorter-Dallardsville complex, 0 to 1 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Oil-waste land is an example.

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

AnA—Anahuac-Aris complex, 0 to 1 percent slopes

Setting

Landscape: Coastal Plain
Landform: Anahuac—ridge; Aris—flat
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 15 to 100 acres

Typical Profile

Anahuac

Surface layer:
0 to 8 inches—very dark grayish brown, very strongly acid very fine sandy loam
8 to 19 inches—brown, very strongly acid very fine sandy loam

Subsurface layer:
19 to 32 inches—pale brown, very strongly acid very fine sandy loam

Subsoil:
32 to 49 inches—mottled, grayish brown, strongly acid clay
49 to 72 inches—mottled, light brownish gray, moderately acid clay
72 to 80 inches—mottled, light brownish gray, moderately acid clay loam

Aris

Surface layer:
0 to 6 inches—mottled, grayish brown, very strongly acid silt loam

Subsurface layer:
6 to 15 inches—mottled, light brownish gray, very strongly acid silt loam
15 to 24 inches—light brownish gray, very strongly acid silty clay loam

Subsoil:
24 to 80 inches—mottled, gray and light gray, very strongly acid clay loam

Soil Properties

Depth: Very deep
Drainage class: Anahuac—moderately well drained; Aris—poorly drained
Water table: Anahuac—a perched water table exists from a depth of 1.5 to 2.5 feet during November to March, and an apparent water table exists from a depth of 4 to 6 feet during November to April; Aris—a perched water table exists from the surface to a depth of 2.5 feet during November to March.
Ponding: Aris—from the surface to 0.5 feet above the surface during November to March
Flooding: None

Runoff: Low
Permeability: Very slow
Available water capacity: Anahuac—high; Aris—moderate
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Anahuac—low in the surface layer, high in the subsoil layers; Aris—low in the surface layer, moderate in the subsoil layers
Water erosion hazard: Slight

Composition

The Anahuac soil and similar soils: 55 to 65 percent
The Aris soils and similar soils: 25 to 30 percent
Contrasting inclusions: 5 to 20 percent

Contrasting Inclusions

- The Batson soils have loamy subsoils and are on positions similar to those of the Anahuac soils.
- The Labelle soils have darker colored surface layers and are on slightly lower positions than Anahuac soils. They are on higher positions than Aris soils.
- The Leton soils have loamy subsoils and are in positions similar to those of the Aris soils.

Land Uses

Major land use: Pasture
Other land uses: Cropland, wildlife habitat, urban development, woodland, recreation

Management Concerns

Pasture
Major limitations:
- The seasonal high water table limits the use of equipment on the Aris soils.
- Plant growth and yield are limited on the Aris soils during wet conditions.

Cropland
Major limitations:
- Seedbed preparation, planting time, growth, and yield on the Aris soils are limited during wet conditions.

Wildlife Habitat
Major limitations:
- The seasonal high water table in the Aris soils limits plants grown for food and cover for wildlife.

Urban Development
Major limitations:
- The seasonal high water table in the Aris soils limits most urban uses.
- The Aris soils are highly corrosive to steel because of acidity and the fluctuating water table.

Minor limitations:
- The moderate to high shrink-swell in the subsoil limits the use of these soils for buildings and roads.

Woodland
Major limitations:
- The seasonal high water table in the Aris soils limits the use of equipment.

- Plant competition and the seasonal high water table limits the development of pine stands.

Minor limitations:

- The silt loam surface layer limits the use for log landings.

Recreation

Major limitations:

- The seasonal high water table in the Aris soils limits recreational uses.

Interpretive Groups

Land capability classification: Anahuac soil—2w; Aris soil—4w
Woodland group: Anahuac—11; Aris—13

ArA—Aris-Levac complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Aris—flat; Levac—leveled mound
Slope: Nearly level
Shape of areas: Areas are defined by the boundaries of fields that have been leveled.
Size of areas: 25 to 200 acres

Typical Profile

Aris

Surface layer:
0 to 6 inches—mottled, grayish brown, very strongly acid silt loam

Subsurface layer:
6 to 15 inches—mottled, light brownish gray, very strongly acid silt loam
15 to 24 inches—light brownish gray, very strongly acid silty clay loam

Subsoil:
24 to 80 inches—mottled, gray and light gray, very strongly acid clay loam

Levac

Surface layer:
0 to 4 inches—very dark grayish brown, neutral silt loam

Subsurface layer:
4 to 13 inches—mottled, grayish brown, slightly alkaline silt loam

Subsoil:
13 to 17 inches—mottled, grayish brown, slightly alkaline silty clay loam
17 to 72 inches—mottled, light brownish gray, slightly alkaline silty clay
72 to 80 inches—light brownish gray, slightly alkaline clay

Soil Properties

Depth: Very deep
Drainage class: Aris—poorly drained; Levac—somewhat poorly drained
Water table: Aris—a perched water table exists from the surface to a depth of 2.5 feet during November to March; Levac—a perched water table exists from a depth of 0.5 foot to 2 feet below the surface during January to March.
Ponding: Aris—from the surface to 0.5 foot above the surface during November to March
Flooding: None
Runoff: Low

Permeability: Very slow
Available water capacity: Aris—moderate; Levac—high
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Aris—low in the surface layer, moderate in the subsoil; Levac—low in the surface layer, high in the subsoil
Water erosion hazard: Slight

Composition

The Aris soil and similar soils: 65 to 70 percent
The Levac soil and similar soils: 20 to 25 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The somewhat poorly drained Labelle soils are on slightly higher positions than Aris soils.
- The Leton soils have loamy subsoils and are in lower positions than Aris soils.
- The Spindletop soils are on mounds.

Land Uses

Major land use: Pasture
Other land uses: Cropland, wildlife habitat, urban development, woodland, recreation

Management Concerns

Pasture
Major limitations:
- The seasonal high water table in the Aris soils limits the use of equipment.
- Plant growth and yield are limited on the Aris soils during wet conditions.

Cropland
Major limitations:
- Seedbed preparation, planting time, growth, and yield are limited during wet conditions on the Aris soils.

Wildlife Habitat
Major limitations:
- The seasonal high water table in the Aris soils limits plants grown for food and cover for wildlife.

Urban Development
Major limitations:
- The seasonal high water table in the Aris soils limits most urban uses.
- The Aris soils are highly corrosive to steel because of acidity and the fluctuating water table.

Minor limitations:
- The moderate to high shrink-swell in the subsoil limits the use of these soils for buildings and roads.

Woodland
Major limitations:
- The seasonal high water table in the Aris soils limits the use of equipment.
- Plant competition and the seasonal high water table limits the development of pine stands.

Minor limitations:
- The silt loam surface layer limits the use for log landings.

Recreation

Major limitations:

- The seasonal high water table in the Aris soils limits recreational uses.

Interpretive Groups

Land capability classification: Aris soil—4w; Levac soil—3w
Woodland group: Aris—13; Levac—none assigned

AsA—Aris-Spindletop complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Aris—talf on flat; Spindletop—pimple mound
Slope: Nearly level
Shape of areas: Most areas are irregularly shaped, but some areas have linear boundaries when next to a leveled field.
Size of areas: 25 to 200 acres

Typical Profile

Aris

Surface layer:
0 to 6 inches—mottled, grayish brown, very strongly acid silt loam

Subsurface layer:
6 to 15 inches—mottled, light brownish gray, very strongly acid silt loam
15 to 24 inches—light brownish gray, very strongly acid silty clay loam

Subsoil:
24 to 80 inches—mottled, gray and light gray, very strongly acid clay loam

Spindletop

Surface layer:
0 to 10 inches—very dark grayish brown, strongly acid silt loam

Subsurface layer:
10 to 21 inches—dark grayish brown, strongly acid silt loam

Subsoil:
21 to 26 inches—mottled, dark grayish brown, slightly acid silty clay loam
26 to 34 inches—mottled, gray, slightly acid clay
34 to 80 inches—mottled, gray, slightly acid silty clay

Soil Properties

Depth: Very deep
Drainage class: Aris—poorly drained; Spindletop—moderately well drained
Water table: Aris—a perched water table exists from the surface to a depth of 2.5 feet during November to March; Spindletop—a perched water table exists from a depth of 1.5 to 3.5 feet during January to March.
Ponding: Aris—from the surface to 0.5 foot above the surface during November to March
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: Aris—moderate; Spindletop—high
Root zone: Very deep
Salinity: Nonsaline

Shrink-swell potential: Aris—low in the surface layer, moderate in the subsoil; Spindletop—low in the surface layer, high in the subsoil
Water erosion hazard: Slight

Composition

The Aris soil and similar soils: 65 to 75 percent
The Spindletop soil and similar soils: 20 to 25 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The somewhat poorly drained Labelle soils have darker colored surface layers and are on slightly higher positions than Aris soils.
- The Leton soils have loamy subsoils and are in lower positions than Aris soils.

Land Uses

Major land use: Pasture
Other land uses: Cropland, wildlife habitat, urban development, woodland, recreation

Management Concerns

Pasture
Major limitations:
- The seasonal high water table in the Aris soils limits the use of equipment.
- Plant growth and yield are limited on the Aris soils during wet conditions.

Minor limitations:
- The mounded Spindletop soil limits the use of equipment.

Cropland
Major limitations:
- Seedbed preparation, planting time, growth, and yield are limited during wet conditions on the Aris soils.

Minor limitations:
- The mounded Spindletop soil limits the use of equipment.

Wildlife Habitat
Major limitations:
- The seasonal high water table in the Aris soils limits plants grown for food and cover for wildlife.

Urban Development
Major limitations:
- The seasonal high water table in the Aris soils limits most urban uses.
- The Aris soils are highly corrosive to steel because of acidity and the fluctuating water table.

Minor limitations:
- The moderate to high shrink-swell in the subsoil limits the use for buildings and roads.

Woodland
Major limitations:
- The seasonal high water table in the Aris soils limits the use of equipment.
- Plant competition and the seasonal high water table limits the development of pine stands.

Minor limitations:
- The silt loam surface layer limits the use for log landings.

Recreation

Major limitations:

- The seasonal high water table in the Aris soils limits recreational uses.

Interpretive Groups

Land capability classification: Aris soil—4w; Spindletop soil—2w
Woodland group: Aris—13; Spindletop—none assigned

BaA—Batson very fine sandy loam, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Broad ridge
Slope: Nearly level
Shape of areas: Linear
Size of areas: 20 to 200 acres

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown, moderately acid very fine sandy loam

Subsurface layer:
6 to 29 inches—light yellowish brown and brownish yellow, moderately acid very fine sandy loam

29 to 35 inches—mottled, yellowish brown and brownish yellow, moderately acid very fine sandy loam

Subsoil:
35 to 55 inches—mottled, brownish yellow and light gray, extremely acid sandy clay loam
55 to 80 inches—mottled, brownish yellow and very pale brown, extremely acid very fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: A seasonal high water table exists at a depth of 2 to 3 feet during December to March.
Flooding: None
Runoff: Negligible
Permeability: Moderate
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Batson soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Anahuac soils have clayey subsoils and are on similar positions.
- The very poorly drained Camptown soils are in depressions.

- The Evadale soils have clayey subsoils and are in lower positions.
- The Gist soils are on mounds.

Land Uses

Major land use: Woodland
Other land uses: Pasture, cropland (fig. 7), wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits the use of equipment.

Pasture
Major limitations:
- There are no major limitations.

Cropland
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits the use of equipment.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Figure 7.—Soybeans in an area of Batson very fine sandy loam, 0 to 1 percent slopes.

Urban Development
Major limitations:
- The seasonal high water table limits septic tank absorption fields.

Minor limitations:
- The seasonal high water table limits excavations and trenches.

Recreation
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits playgrounds, picnic areas, and camp areas.

Interpretive Groups

Land capability classification: 2w
Woodland group: 2

BeA—Beaumont clay, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Broad flats and slight depressions Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 200 acres

Typical Profile

Surface layer:
0 to 15 inches—mottled, dark gray, very strongly acid clay

Subsoil:
15 to 38 inches—mottled, gray, very strongly acid clay
38 to 55 inches—mottled, gray, moderately acid clay
to 80 inches—mottled, gray, neutral clay

Soil Properties

Depth: Very deep
Drainage class: Poorly drained
Water table: A seasonal high water table exists from the surface to a depth of 2 feet during November to March.
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Very high
Water erosion hazard: Slight

Composition

The Beaumont soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Contrasting Inclusions

- The somewhat poorly drained League soils are on slightly higher positions.

Land Uses

Major land use: Pasture (fig. 8)
Other land uses: Cropland, wildlife habitat, urban development, woodland, recreation

Management Concerns

Pasture
Major limitations:
- The clayey surface layer limits the use of equipment during extremely wet conditions and becomes hard when dry.
- Plant growth and yields are limited during wet periods.

Cropland
Major limitations:
- The clayey surface layer limits the use of equipment during extremely wet conditions and becomes hard when dry.
- Seedbed preparation, planting time, growth, and yields are limited during wet periods.

Wildlife Habitat
Major limitations:
- The clayey surface layer limits the use of equipment for establishing food and cover plants during extremely wet or dry conditions.
- The seasonal high water table limits plants grown for food and cover for wildlife.

Figure 8.—Pasture in an area of Beaumont clay, 0 to 1 percent slopes.

Urban Development
Major limitations:
- The clayey surface and subsoil limits most urban uses because of high shrink-swell, compaction, and difficulty in excavation.
- The seasonal high water table limits most urban uses.
- These soils are highly corrosive to steel.

Woodland
Major limitations:
- The seasonal high water table limits the use for woodland management.
- The clayey surface layer limits the use for woodland management during extremely wet or dry conditions.

Minor limitations:
- Plant competition limits the development of pine stands.

Recreation
Major limitations:
- The seasonal high water table limits recreational uses.
- The clayey surface layer limits recreational uses during extremely wet and dry conditions because of compaction and low trafficability.

Interpretive Groups

Land capability classification: 4w
Woodland group: 13

BoB—Belrose loamy very fine sand, 1 to 3 percent slopes

Setting

Landscape: River valley on Coastal Plain
Landform: Terrace riser
Slope: Very gently sloping
Shape of areas: Irregular
Size of areas: 15 to 400 acres

Typical Profile

Surface layer:
0 to 5 inches—brown, very strongly acid loamy very fine sand

Subsoil:
5 to 20 inches—yellowish brown, very strongly acid loamy very fine sand
20 to 44 inches—yellowish brown and brownish yellow, strongly acid loamy very fine sand
44 to 63 inches—mottled, very pale brown and brownish yellow, strongly acid loamy very fine sand
63 to 75 inches—brownish yellow and very pale brown, strongly acid very fine sandy loam
75 to 80 inches—very pale brown and reddish yellow, very strongly acid loamy fine sand

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: A seasonal high water table exists at a depth of 2.5 to 4 feet during December to March.
Flooding: None

Runoff: Negligible
Permeability: Moderate
Available water capacity: Moderate
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Belrose soil and similar soils: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Contrasting Inclusions

- The sandy Babco soils are on similar positions.
- The very poorly drained Caneyhead and Tyden soils are in depressions.
- The Kenefick soils have red subsoils and are on similar positions.
- The Spurger soils have red subsoils and are on slightly higher positions.
- The sandy Votaw soils are on similar to slightly lower positions.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development

Management Concerns

Woodland
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits the use of equipment.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table during the growing season limits the growth and yield of plants used for food and cover.

Recreation
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits recreational uses.

Urban Development
Major limitations:
- The seasonal high water table limits most urban uses.

Minor limitations:
- These soils are highly corrosive to concrete.

Interpretive Groups

Land capability classification: 2w
Woodland group: 1

BrA—Belrose-Caneyhead complex, 0 to 1 percent slopes

Setting

Landscape: River valley on Coastal Plain
Landform: Belrose—ridges; Caneyhead—swales
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 500 acres

Typical Profile

Belrose

Surface layer:
0 to 5 inches—brown, very strongly acid loamy very fine sand

Subsoil:
5 to 20 inches—yellowish brown, very strongly acid loamy very fine sand
20 to 44 inches—yellowish brown and brownish yellow, strongly acid loamy very fine sand
44 to 63 inches—mottled, very pale brown and brownish yellow, strongly acid loamy very fine sand
63 to 75 inches—brownish yellow and very pale brown, strongly acid very fine sandy loam
75 to 80 inches—very pale brown and reddish yellow, very strongly acid loamy fine sand

Caneyhead

Surface layer:
0 to 4 inches—mottled, grayish brown very strongly acid silt loam

Subsurface layer:
4 to 18 inches—mottled, light gray and light brownish gray, very strongly acid silt loam

Subsoil:
18 to 29 inches—mottled, gray, extremely acid silt loam
29 to 63 inches—mottled, gray and brownish yellow, very strongly acid silty clay loam
63 to 80 inches—mottled, greenish gray, very strongly acid silt loam

Soil Properties

Depth: Very deep
Drainage class: Belrose—moderately well drained; Caneyhead—very poorly drained
Water table: Belrose—a perched water table exists at a depth of 2 to 4 feet during December to March; Caneyhead—a seasonal high water table exists from the surface to a depth of 1.6 feet during November to June.
Ponding: Caneyhead—from the surface to 0.5 foot above the surface during November to June
Flooding: None
Runoff: Negligible
Permeability: Belrose—moderate; Caneyhead—slow
Available water capacity: Belrose—moderate; Caneyhead—high
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Belrose soil and similar soils: 55 to 60 percent
The Caneyhead soil and similar soils: 30 to 35 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The sandy Babco soils are on positions similar to those of the Belrose soils.
- The Kenefick soils have red subsoils and are on positions similar to those of the Belrose soils.
- The Spurger soils have red clayey subsoils and are on positions similar to those of the Belrose soils.
- The Tyden soils have less than 18 percent clay in the subsoil and are on positions similar to those of the Caneyhead soils.
- The sandy Votaw soils are on positions similar to or slightly lower than those of the Belrose soils.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- Ponding for long periods makes the Caneyhead soils unsuitable for pine production.
- The Belrose soils have no major limitations to woodland management.

Minor limitations:
- The seasonal high water table in the Belrose soils limits the use of equipment.

Wildlife Habitat
Major limitations:
- There are no major limitations for the Belrose soils for this use.
- Ponding for long periods makes the Caneyhead soils unsuitable for wildlife habitat management.

Minor limitations:
- The seasonal high water table in the Belrose soils during the growing season limits the growth and yield of plants used for food and cover.

Urban Development
Major limitations:
- Ponding makes the Caneyhead soils unsuitable for most urban uses.
- The seasonal high water table in the Belrose soils limits most urban uses.

Minor limitations:
- The Belrose soils are highly corrosive to concrete.

Recreation
Major limitations:
- Ponding makes the Caneyhead soils unsuitable for recreational use.
- There are no major limitations for the Belrose soils for recreational uses.

Minor limitations:
- The seasonal high water table limits the Belrose soils for most recreational uses.

Interpretive Groups

Land capability classification: Belrose soil—2w; Caneyhead soil—4w
Woodland group: Belrose soil—1; Caneyhead soil—19

BvA—Bevil clay, 0 to 1 percent slopes

Setting

Landscape: Coastal Plain
Landform: Depressions and flats
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 40 to 200 acres

Typical Profile

Surface layer:
0 to 4 inches—mottled, dark grayish brown, very strongly acid clay

Subsoil:
4 to 10 inches—mottled, grayish brown, very strongly acid clay
10 to 22 inches—mottled, gray, very strongly acid clay
22 to 37 inches—mottled, light brownish gray, very strongly acid clay
37 to 80 inches—mottled, gray and light gray, very strongly acid clay

Soil Properties

Depth: Very deep
Drainage class: Poorly drained
Water table: A seasonal high water table exists from the surface to a depth of 1 foot during January to March.
Ponding: Brief to long duration following wet periods
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Very high
Water erosion hazard: Slight

Composition

The Bevil soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Contrasting Inclusions

- The loamy Camptown soils are on similar to lower positions.
- The loamy Evadale soils are on slightly higher positions.
- The loamy Texla soils are on mounds and ridges.
- The somewhat poorly drained Vamont soils are on slightly higher positions.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- The seasonal high water table limits the use for woodland management.
- The clayey surface layer limits the use of equipment during extremely wet conditions and becomes hard when dry.

Minor limitations:
- Plant competition limits the development of pine stands.

Wildlife Habitat
Major limitations:
- The clayey surface layer limits the use of equipment for establishing food and cover plants during extremely wet or dry conditions.
- The seasonal high water table limits plants grown for food and cover for wildlife.

Urban Development
Major limitations:
- The clayey surface and subsoil limits most urban uses because of high shrink swell, compaction, and difficulty in excavation.
- The seasonal high water table limits most urban uses.
- These soils are highly corrosive to steel and concrete.

Recreation
Major limitations:
- The seasonal high water table limits recreational uses.
- The clayey surface layer limits recreational uses during extremely wet and dry conditions because of compaction and low trafficability.

Interpretive Groups

Land capability classification: 4w
Woodland group: 12

CaA—Camptown silt loam, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Depression
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 10 to 100 acres

Typical Profile

Surface layer:
0 to 4 inches—mottled, grayish brown, very strongly acid silt loam

Subsurface layer:
4 to 13 inches—mottled, light gray, very strongly acid silt loam

Subsoil:
13 to 46 inches—mottled, gray and light gray, slightly acid silt loam and loam
46 to 69 inches—mottled, light gray, neutral loam
69 to 80 inches—mottled, light gray, neutral clay loam

Soil Properties

Depth: Very deep
Drainage class: Very poorly drained

Water table: A seasonal high water table exists from the surface to a depth of 6 feet during December to August.
Ponding: From the surface to 1 foot above the surface during December to March
Flooding: None
Runoff: Negligible
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Soil reaction: Very strongly acid
Salinity: Nonsaline
Shrink-swell potential: Low in the surface; moderate in the subsoil
Water erosion hazard: Slight

Composition

The Camptown soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Batson, Gist, and Texla soils have brown subsoils and are on mounds or ridges.

Land Uses

Major land use: Wildlife habitat
Other land uses: Woodland, urban development

Management Concerns

Wildlife Habitat
Major limitations:
- These soils are not suited to wildlife habitat management because of ponding and seasonal high water table.

Woodland
Major limitations:
- These soils are not suited to pine production because of ponding and seasonal high water table.

Urban Development
Major limitations:
- These soils are not suited to most urban uses because of ponding and seasonal high water table.

Interpretive Groups

Land capability classification: 7w
Woodland group: 16

CbA—Camptown-Batson complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Camptown—depressions; Batson—ridges
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 100 to 300 acres

Typical Profile

Camptown

Surface layer:
0 to 4 inches—mottled, grayish brown, very strongly acid silt loam

Subsurface layer:
4 to 13 inches—mottled, light gray, very strongly acid silt loam

Subsoil:
13 to 46 inches—mottled, gray and light gray, slightly acid silt loam and loam
46 to 69 inches—mottled, light gray, neutral loam
69 to 80 inches—mottled, light gray, neutral clay loam

Batson

Surface layer:
0 to 6 inches—very dark grayish brown, moderately acid very fine sandy loam

Subsurface layer:
6 to 29 inches—light yellowish brown and brownish yellow, moderately acid very fine sandy loam

29 to 35 inches—mottled, yellowish brown and brownish yellow, moderately acid very fine sandy loam

Subsoil:
35 to 55 inches—mottled, brownish yellow and light gray, extremely acid sandy clay loam
55 to 80 inches—mottled, brownish yellow and very pale brown, extremely acid very fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Camptown—very poorly drained; Batson—moderately well drained
Water table: Camptown—a seasonal high water table exists from the surface to a depth of 6 feet during December to August; Batson—a seasonal high water table exists at a depth of 2 to 3 feet during December to March.
Ponding: Camptown—from the surface to 1 foot above the surface during December to March
Flooding: None
Runoff: Negligible
Permeability: Camptown—very slow; Batson—moderate
Available water capacity: High
Root zone: Very deep
Salinity: Camptown—very slightly saline at the surface and salinity increases with depth; Batson—nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Camptown soil and similar soils: 45 to 55 percent
The Batson soil and similar soils: 35 to 40 percent
Contrasting inclusions: 5 to 20 percent

Contrasting Inclusions

- The Anahuac soils have clayey subsoils and are on positions similar to Batson soils.

- The Gist soils have less than 18 percent clay in the subsoil and are on mounds.
- The Evadale soils have clayey subsoils and are on slightly higher positions than Camptown soils.

Land Uses

Major land use: Wildlife habitat
Other land uses: Woodland, urban development, recreation

Management Concerns

Wildlife Habitat
Major limitations:
- These soils are not suited to wildlife habitat management because of ponding and seasonal high water table.

Woodland
Major limitations:
- These soils are not suited to pine production because of ponding and seasonal high water table.

Urban Development
Major limitations:
- These soils are not suited to most urban uses because of ponding and seasonal high water table.

Recreation
Major limitations:
- These soils are not suited to most recreational activities because of ponding and seasonal high water table on the Camptown soils.

Minor limitations:
- The seasonal high water table in the Batson soils limits the use for playgrounds, picnic areas, and camp areas.

Interpretive Groups

Land capability classification: Camptown soil—7w; Batson soil—2w
Woodland group: Camptown soil—16; Batson soil—2

CyA—Cypress mucky clay, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: River valley on flat Coastal Plain
Landform: Swamp
Slope: Nearly level
Shape of areas: Crescent-shaped
Size of areas: 15 to 200 acres

Typical Profile

Surface layer:
0 to 12 inches—very dark grayish brown, extremely acid mucky clay

Subsoil:
12 to 17 inches—mottled, dark gray, extremely acid clay
17 to 80 inches—mottled, gray, extremely acid clay

Soil Properties

Depth: Very deep
Drainage class: Very poorly drained
Water table: A water table exists from the surface to a depth of greater than 6 feet during January to December.
Ponding: From the surface to 4 feet above the surface during January to December
Flooding: Frequently; for very long duration during January to December
Runoff: Negligible
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Moderate
Water erosion hazard: Slight

Composition

The Cypress soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Contrasting Inclusions

- The loamy Angelina soils are on similar positions.
- The clayey Estes soils are on slightly higher positions.
- The loamy Manco soils are on slightly higher positions.

Land Uses

Major land use: Wildlife habitat
Other land uses: Recreation

Management Concerns

Wildlife Habitat
Major limitations:

- These soils are not suited to wildlife habitat management because of ponding and flooding.

Recreation
Major limitations:

- These soils are not suited to most recreational activities because of ponding and flooding.

Interpretive Groups

Land capability classification: 8w
Woodland group: 21

DAM—Dam

These areas consist of barriers built across a waterway to control the flow or raise the level of surface water.

EsA—Estes clay, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: River valley on flat Coastal Plain
Landform: Flood plain

Slope: Nearly level
Shape of areas: Long and narrow along small creeks and broad along the Neches River
Size of areas: 300 to 1,000 acres

Typical Profile

Surface layer:
0 to 8 inches—mottled, brown, very strongly acid clay

Subsoil:
8 to 23 inches—mottled, brown, very strongly acid clay
23 to 31 inches—mottled, light brownish gray, very strongly acid clay
31 to 62 inches—mottled, light gray, very strongly acid clay
62 to 80 inches—mottled, light gray, moderately acid clay

Soil Properties

Depth: Very deep
Drainage class: Somewhat poorly drained
Water table: A seasonal high water table exists from the surface to a depth of 2 feet during November to May.
Flooding: Frequent; for long duration during November to May
Runoff: Negligible
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: High
Water erosion hazard: Slight

Composition

The Estes soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The loamy Angelina soils are in swales of flood plains.
- The loamy Bleakwood and Manco soils are on positions similar to Estes soils.
- The loamy Iulus soils are on levees along creeks and rivers.

Land Uses

Major land use: Wildlife habitat
Other land uses: Recreation

Management Concerns

Wildlife Habitat
Major limitations:
- These soils are not suited to wildlife habitat management because of ponding and flooding.

Recreation
Major limitations:
- These soils are not suited to most recreational activities because of ponding and flooding.

Interpretive Groups

Land capability classification: 5w
Woodland group: 8

EtA—Estes-Angelina complex, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: River valley on Coastal Plain
Landform: Estes—flats; Angelina—sloughs
Slope: Nearly level
Shape of areas: Broad and oblong
Size of areas: 100 to 5,000 acres

Typical Profile

Estes

Surface layer:
0 to 8 inches—mottled, brown, very strongly acid clay

Subsoil:
8 to 23 inches—mottled, brown, very strongly acid clay
23 to 31 inches—mottled, light brownish gray, very strongly acid clay
31 to 62 inches—mottled, light gray, very strongly acid clay
62 to 80 inches—mottled, light gray, moderately acid clay

Angelina

Surface layer:
0 to 5 inches—mottled, dark grayish brown, extremely acid fine sandy loam

Subsoil:
5 to 14 inches—mottled, light gray, very strongly acid loam
14 to 29 inches—mottled, bluish gray, very strongly acid sandy clay loam
29 to 46 inches—mottled, greenish gray, very strongly acid clay loam
46 to 67 inches—mottled, gray and brownish yellow, very strongly acid clay loam
67 to 80 inches—mottled, greenish gray, extremely acid clay loam

Soil Properties

Depth: Very deep
Drainage class: Estes—somewhat poorly drained; Angelina—very poorly drained
Water table: Estes—from the surface to a depth of 2 feet during November to May; Angelina—from the surface to more than 6 feet during January to December
Ponding: Angelina—from the surface to 2 feet above the surface during January to December
Flooding: Estes—frequent; for long duration during November to May; Angelina—frequent; for long duration during January to December
Runoff: Negligible
Permeability: Estes—very slow; Angelina—slow
Available water capacity: Estes—high; Angelina—moderate
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Estes—high; Angelina—low
Water erosion hazard: Slight

Composition

The Estes soil and similar soils: 50 to 55 percent
The Angelina soil and similar soils: 35 to 40 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The Cypress soils have clayey subsoils and are in sloughs.
- The Iulus soils have brown loamy subsoils and are on levees.
- The Manco soils have loamy subsoils and are on positions similar to Estes soils.

Land Uses

Major land use: Wildlife habitat (fig. 9)
Other land uses: Recreation

Management Concerns

Wildlife Habitat
Major limitations:
- These soils are not suited to wildlife habitat management because of ponding and flooding.

Recreation
Major limitations:
- These soils are not suited to most recreational activities because of ponding and flooding.

Interpretive Groups

Land capability classification: Estes soil—5w; Angelina soil—6w
Woodland group: Estes soil—8; Angelina soil—19

Figure 9.—Cypress trees on Angelina soils in an area of Estes-Angelina complex, 0 to 1 percent slopes, frequently flooded.

EvA—Evadale silt loam, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Broad flats
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 500 acres

Typical Profile

Surface layer:
0 to 5 inches—mottled, grayish brown, very strongly acid silt loam

Subsurface layer:
5 to 16 inches—mottled, light brownish gray, very strongly acid silt loam
16 to 25 inches—mottled, light gray and gray, extremely acid silt loam

Subsoil:
25 to 41 inches—mottled, gray and light gray, extremely acid silty clay
41 to 80 inches—mottled, gray, extremely acid to strongly acid clay

Soil Properties

Depth: Very deep
Drainage class: Poorly drained
Water table: A seasonal high water table exists from the surface to a depth of 3 feet during December to April.
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: High
Salinity: Nonsaline at the surface but increases with depth
Shrink-swell potential: Low in the surface; high in the subsoil
Water erosion hazard: Slight

Composition

The Evadale soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Camptown soils have loamy subsoils and are in depressions.
- The Gist soils have brown subsoils and are on mounds.
- The Texla soils have brown subsoils and are on mounds and ridges.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- The seasonal high water table limits the use for woodland management.

Wildlife Habitat
Major limitations:

- The seasonal high water table limits the establishment, growth, and yield of plants used for food and cover because of wetness.

Urban Development
Major limitations:

- The seasonal high water table limits most urban uses.
- These soils are highly corrosive to steel and concrete.

Minor limitations:

- The moderate shrink-swell limits the use of these soils for most urban uses.

Recreation
Major limitations:

- The seasonal high water table limits recreational uses.

Interpretive Groups

Land capability classification: 4w
Woodland group: 4

EwA—Evadale-Gist complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Evadale—intermound; Gist—pimple mounds
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 400 acres

Typical Profile

Evadale

Surface layer:
0 to 5 inches—mottled, grayish brown, very strongly acid silt loam

Subsurface layer:
5 to 16 inches—mottled, light brownish gray, very strongly acid silt loam
16 to 25 inches—mottled, light gray and gray, extremely acid silt loam

Subsoil:
25 to 41 inches—mottled, gray and light gray, extremely acid silty clay
41 to 80 inches—mottled, gray, extremely acid to strongly acid clay

Gist

Surface layer:
0 to 4 inches—grayish brown, extremely acid silt loam

Subsurface layer:
4 to 15 inches—mottled, pale brown, extremely acid silt loam

Subsoil:
15 to 41 inches—mottled, yellowish brown, extremely acid silt loam
41 to 53 inches—mottled, light brownish gray, very strongly acid clay loam
53 to 80 inches—mottled, light gray, very strongly acid clay loam

Soil Properties

Depth: Very deep
Drainage class: Evadale—poorly drained; Gist—moderately well drained
Water table: Evadale—from the surface to a depth of 3 feet during December to April; Gist—from a depth of 2 to 4 feet during November to May
Runoff: Low
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Salinity: Evadale—nonsaline at the surface but increases with depth; Gist—nonsaline
Shrink-swell potential: Evadale—low in the surface, high in the subsoil; Gist—low
Water erosion hazard: Slight

Composition

The Evadale soil and similar soils: 60 to 70 percent
The Gist soil and similar soils: 20 to 25 percent
Contrasting inclusions: 5 to 20 percent

Contrasting Inclusions

- The moderately well drained Batson soils have loamy subsoils and are on ridges.
- The Camptown soils have loamy subsoils and are in depressions.
- The Texla soils have loamy subsoils and are on mounds and ridges.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- The seasonal high water table in Evadale soils limits the use for woodland management.

Minor limitations:
- The mounded Gist soils limits the use of equipment.

Wildlife Habitat
Major limitations:
- The seasonal high water table in Evadale soils limits the establishment, growth, and yield of plants used for food and cover.

Urban Development
Major limitations:
- The seasonal high water table in Evadale soils limits the use for most urban developments.
- These soils are highly corrosive to steel and concrete.

Minor limitations:
- The moderate shrink-swell in Evadale soils limits the use for most urban developments.

Recreation
Major limitations:
- The seasonal high water table in Evadale soils limits recreational uses.

Interpretive Groups

Land capability classification: Evadale soil—4w; Gist soil—2w
Woodland group: Evadale soil—4; Gist soil—1

ExA—Evadale-Texla complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Evadale—flats; Texla—mounds
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 2,000 acres

Typical Profile

Evadale

Surface layer:
0 to 5 inches—mottled, grayish brown, very strongly acid silt loam

Subsurface layer:
5 to 16 inches—mottled, light brownish gray, very strongly acid silt loam
16 to 25 inches—mottled, light gray and gray, extremely acid silt loam

Subsoil:
25 to 41 inches—mottled, gray and light gray, extremely acid silty clay
41 to 80 inches—mottled, gray, extremely acid to strongly acid clay

Texla

Surface layer:
0 to 5 inches—dark grayish brown, very strongly acid silt loam

Subsurface layer:
5 to 11 inches—light yellowish brown, very strongly acid silt loam
11 to 17 inches—mottled, light yellowish brown and brownish yellow, extremely acid silt loam

Subsoil:
17 to 38 inches—mottled, brownish yellow and pale brown, extremely acid silt loam
38 to 80 inches—mottled, browns, reds, and grays, very strongly acid clay loam and silty clay loam

Soil Properties

Depth: Very deep
Drainage class: Evadale—poorly drained; Texla—somewhat poorly drained
Water table: Evadale—from the surface to a depth of 3 feet during December to April; Texla—from a depth of 1 to 3 feet during November to May
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Salinity: Evadale—nonsaline at the surface but increases with depth; Texla—nonsaline
Shrink-swell potential: Evadale—low in the surface, high in the subsoil; Texla—low in the surface, moderate in the subsoil
Water erosion hazard: Slight

Composition

The Evadale soil and similar soils: 55 to 60 percent
The Texla soil and similar soils: 30 to 35 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Batson soils have brown subsoils and are on higher positions than those of Evadale and Texla soils.
- The Camptown soils have less than 35 percent clay in the subsoil and are in depressions.
- The Gist soils have less than 18 percent clay in the subsoil and are on similar positions to Texla soils.

Land Uses

Major land use: Woodland
Other land uses: Pasture, wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- The seasonal high water table in Evadale soils limits the use for woodland management.

Minor limitations:
- The mounded Texla soils limit the use of equipment.

Wildlife Habitat
Major limitations:
- The seasonal high water table in Evadale soils limits the establishment, growth, and yield of plants used for food and cover.

Urban Development
Major limitations:
- The seasonal high water table in Evadale soils limits urban uses.
- These soils are highly corrosive to steel and concrete.

Minor limitations:
- The moderate shrink-swell in Evadale soils limits urban uses.

Recreation
Major limitations:
- The seasonal high water table in Evadale soils limits recreational uses.

Interpretive Groups

Land capability classification: Evadale soil—4w; Texla soil—3w
Woodland group: Evadale soil—4; Texla soil—9

IbA—Iulus-Bleakwood complex, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: River valley on flat Coastal Plain
Landform: Iulus—natural levee; Bleakwood—channel
Slope: Nearly level
Shape of areas: Long and narrow along creeks and streams
Size of areas: 100 to 400 acres

Typical Profile

Iulus

Surface layer:
0 to 4 inches—brown, extremely acid loam
Subsoil:
4 to 18 inches—light yellowish brown, extremely acid loam
18 to 58 inches—mottled, yellowish brown, extremely acid fine sandy loam
58 to 80 inches—mottled, light gray, extremely acid fine sandy loam

Bleakwood

Surface layer:
0 to 3 inches—mottled, grayish brown, very strongly acid fine sandy loam

Subsoil:
3 to 14 inches—mottled, light brownish gray, very strongly acid loam
14 to 58 inches—mottled, gray, very strongly acid clay loam
58 to 80 inches—mottled, gray, very strongly acid loam

Soil Properties

Depth: Very deep
Drainage class: Iulus—moderately well drained; Bleakwood—poorly drained
Water table: Iulus—from a depth of 1.5 feet to 5 feet during December to April; Bleakwood—from the surface to a depth of more than 6 feet during September to May
Flooding: Iulus—frequent; for very brief or brief duration during January to December; Bleakwood—frequent; for long duration during December to April
Runoff: Iulus—low; Bleakwood—low
Permeability: Moderate
Available water capacity: Iulus—moderate; Bleakwood—high
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Iulus soil and similar soils: 50 to 60 percent
The Bleakwood soil and similar soils: 25 to 35 percent
Contrasting inclusions: 5 to 25 percent

Contrasting Inclusions

- The Angelina soils are in sloughs.
- The clayey Estes soils are on broad flats.
- The silty Manco soils are on positions similar to Bleakwood soils.

Land Uses

Major land use: Wildlife habitat
Other land uses: Recreation

Management Concerns

Wildlife Habitat

Major limitations:

- Flooding for long periods and a seasonal high water table limits wildlife habitat management.

Recreation
Major limitations:

- Flooding for long periods and a seasonal high water table limits recreational use.

Interpretive Groups

Land capability classification: Iulus soil—5w; Bleakwood soil—5w
Woodland group: Iulus soil—3; Bleakwood soil—5

JaA—Jasco silt loam, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Depressions
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 15 to 100 acres

Typical Profile

Surface layer:
0 to 4 inches—mottled, light brownish gray, very strongly acid; silt loam

Subsurface layer:
4 to 15 inches—mottled, light brownish gray; strongly acid; silt loam
15 to 44 inches—mottled, brittle, light gray, strongly acid silt loam

Subsoil:
44 to 80 inches—mottled, brittle, pinkish gray and light gray, strongly acid silt loam

Soil Properties

Depth: Very deep
Drainage class: Very poorly drained
Water table: A seasonal high water table exists from the surface to a depth of more than 6 feet during September to May.
Ponding: From the surface to 0.5 foot above the surface during September to May
Flooding: None
Runoff: Negligible
Permeability: Very slow
Available water capacity: Low
Root zone: Shallow
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Jasco soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Dallardsville soils have brown subsoils and are on mounds.
- The Jayhawker and Sorter soils have fragipans below 30 inches and are on similar positions.
- The Waller soils have no fragipan and are on similar positions.

Land Uses

Major land use: Wildlife habitat
Other land uses: Woodland, urban development, recreation

Management Concerns

Wildlife Habitat
Major limitations:
- The shallow rooting depth severely limits the growth and yield of plants used for food and cover because of droughtiness.
- When ponded or when the water table is high, wetness limits the establishment, growth, and yield of plants used for food and cover.

Woodland
Major limitations:
- When ponded or when the water table is high, wetness limits the use for woodland management.
- The shallow rooting depth limits the growth of trees.
- The cemented pan limits the use of equipment.

Urban Development
Major limitations:
- The cemented pan limits the use for most urban uses.
- When ponded or when the water table is high, wetness limits the use for most urban uses.
- These soils are corrosive to steel and concrete.

Recreation
Major limitations:
- Ponding or the seasonal high water table limits these soils for most recreational uses.
- The cemented layer limits growth of plants used for recreation.

Interpretive Groups

Land capability classification: 6w
Woodland group: 20

JhA—Jayhawker silt loam, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Slight depressions
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 15 to 400 acres

Typical Profile

Surface layer:
0 to 6 inches—mottled, grayish brown, very strongly acid silt loam

Subsurface layer:
6 to 36 inches—mottled, light brownish gray and gray, very strongly acid or extremely acid silt loam

Subsoil:
36 to 69 inches—mottled, gray and pinkish gray, extremely acid silt loam
69 to 80 inches—mottled, brittle, light gray and light brownish gray, very strongly acid silt loam

Soil Properties

Depth: Very deep
Drainage class: Poorly drained
Water table: A seasonal high water table exists from a depth of 1 to 4 feet during October to June.
Ponding: From the surface to 0.5 foot above the surface during November to May
Flooding: None
Runoff: Negligible
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Jayhawker soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Dallardsville soils have brown subsoil and are on mounds.
- The Jasco and Olive soils have fragipans within 30 inches and are on similar positions.

Land Uses

Major land use: Woodland (fig. 10)
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- Ponding or the seasonal high water table limits the use for woodland management.

Wildlife Habitat
Major limitations:
- Ponding or the seasonal high water table limits the use for wildlife management.

Urban Development
Major limitations:
- Ponding or the seasonal high water table limits the use for most urban uses.

Recreation
Major limitations:
- Ponding or the seasonal high water table limits the use for most recreational uses.

Interpretive Groups

Land capability classification: 4w
Woodland group: 16

Figure 10.—Pine plantation in an area of Jayhawker silt loam, 0 to 1 percent slopes.

KeB—Kenefick fine sandy loam, 1 to 3 percent slopes

Setting

Landscape: River valley on flat Coastal Plain
Landform: Terrace riser
Slope: Very gently sloping
Shape of areas: Elongated
Size of areas: 20 to 200 acres

Typical Profile

Surface layer:
0 to 3 inches—brown, strongly acid fine sandy loam

Subsurface layer:
3 to 26 inches—pale brown and strong brown, strongly acid fine sandy loam

Subsoil:
26 to 55 inches—red and yellowish red, strongly acid clay loam
55 to 80 inches—strong brown and brownish yellow, very strongly acid fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: Greater than 6 feet
Flooding: None

Runoff: Negligible
Permeability: Moderate
Available water capacity: Moderate
Salinity: Nonsaline
Shrink-swell potential: Low in the surface; moderate in the subsoil
Water erosion hazard: Slight

Composition

The Kenefick soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Belrose soils have brown subsoils and are on similar positions.
- The Caneyhead soils have gray subsoils and are in depressions.
- The Spurger soils have clayey subsoils and are on similar positions.
- The sandy Votaw soils are on similar positions.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- There are no major limitations.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Urban Development
Major limitations:
- There are no major limitations.

Minor limitations:
- The moderate shrink-swell limits the use of these soils for buildings and roads.

Recreation
Major limitations:
- There are no major limitations.

Interpretive Groups

Land capability classification: 2e
Woodland group: 1

KfA—Kenefick-Caneyhead complex, 0 to 1 percent slopes

Setting

Landscape: River valley on flat Coastal Plain
Landform: Kenefick—ridges; Caneyhead—swales
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 80 to 500 acres

Typical Profile

Kenefick

Surface layer:
0 to 3 inches—brown, strongly acid fine sandy loam
Subsurface layer:
3 to 26 inches—pale brown and strong brown, strongly acid fine sandy loam

Subsoil:
26 to 55 inches—red and yellowish red, strongly acid clay loam
55 to 80 inches—strong brown and brownish yellow, very strongly acid fine sandy loam

Caneyhead

Surface layer:
0 to 4 inches—mottled, grayish brown very strongly acid silt loam

Subsurface layer:
4 to 18 inches—mottled, light gray and light brownish gray, very strongly acid silt loam

Subsoil:
18 to 29 inches—mottled, gray, extremely acid silt loam
29 to 63 inches—mottled, gray and brownish yellow, very strongly acid silty clay loam
63 to 80 inches—mottled, greenish gray, very strongly acid silt loam

Soil Properties

Depth: Very deep
Drainage class: Kenefick—well drained; Caneyhead—very poorly drained
Water table: Kenefick—greater than 6 feet; Caneyhead—from the surface to a depth of 1 foot during November to June
Ponding: Caneyhead—from the surface to 0.5 foot above the surface during November to June
Flooding: None
Runoff: Low
Permeability: Kenefick—moderate; Caneyhead—slow
Available water capacity: Kenefick—moderate; Caneyhead—high
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Kenefick—low in the surface, moderate in the subsoil; Caneyhead—low
Water erosion hazard: Slight

Composition

The Kenefick soil and similar soils: 55 to 60 percent
The Caneyhead soil and similar soils: 25 to 30 percent
Contrasting inclusions: 10 to 20 percent

Contrasting Inclusions

- The Belrose soils have less than 18 percent clay in the subsoil and are on similar positions as those of the Kenefick soils.
- The Spurger soils have clayey subsoils and are on positions similar to those of the Kenefick soils.
- The sandy Votaw soils are on higher positions than those of the Caneyhead and Kenefick soils.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- Ponding or seasonal high water table makes Caneyhead soils unsuitable for pine production.
- The Kenefick soils have no major limitations for woodland management.

Wildlife Habitat
Major limitations:
- The Caneyhead soils are not suited to wildlife habitat management because of ponding and seasonal high water table.
- The Kenefick soils have no major limitations for wildlife habitat.

Urban Development
Major limitations:
- The Caneyhead soils are not suited to most urban uses because of ponding and seasonal high water table.
- The Kenefick soils have no major limitations for urban uses.

Recreation
Major limitations:
- The Caneyhead soils are not suited to most recreational activities because of ponding and seasonal high water table.
- The Kenefick soils have no major limitations for recreational use.

Interpretive Groups

Land capability classification: Kenefick soil—2e; Caneyhead soil—4w
Woodland group: Kenefick soil—1; Caneyhead soil—19

KrB—Kirbyville very fine sandy loam, 0 to 2 percent slopes

Setting

Landscape: Inland dissected Coastal Plain
Landform: Rise on flat
Slope: Very gently sloping
Shape of areas: Irregular
Size of areas: 15 to 200 acres

Typical Profile

Surface layer:
0 to 5 inches—mottled, dark grayish brown, strongly acid very fine sandy loam

Subsurface layer:
5 to 18 inches—mottled, light yellowish brown, strongly acid loam

Subsoil:
18 to 25 inches—mottled, yellowish brown and light yellowish brown, strongly acid loam
25 to 60 inches—mottled, brownish yellow, yellowish brown, and light brownish gray, very strongly acid loam
60 to 80 inches—mottled, brownish yellow and light gray, strongly acid clay loam

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: A seasonal high water table is at a depth of 1.5 to 3 feet during January to March.
Flooding: None
Runoff: Very low
Permeability: Moderate
Available water capacity: High
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Kirbyville soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Kountze soils have less than 18 percent clay in the subsoil and are on similar positions.
- The well drained Otanya soils are on higher positions.
- The poorly drained Sorter soils are in lower positions.
- The Waller soils have gray subsoils and are in depressions.

Land Uses

Major land use: Woodland
Other land uses: Pasture, wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table and wetness in the Kirbyville soils limits the use of equipment.

Pasture
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table and wetness in the Kirbyville soils limits the use of equipment.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Urban Development
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table and wetness in the Kirbyville soils limits most urban uses.

Recreation

Major limitations:

- There are no major limitations.

Interpretive Groups

Land capability classification: 2w
Woodland group: 2

KwA—Kirbyville-Niwana complex, 0 to 1 percent slopes

Setting

Landscape: Inland dissected Coastal Plain
Landform: Kirbyville—flats; Niwana—mounds
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 20 to 200 acres

Typical Profile

Kirbyville

Surface layer:
0 to 5 inches—mottled, dark grayish brown, very strongly acid very fine sandy loam

Subsurface layer:
5 to 18 inches—mottled, light yellowish brown, very strongly acid loam

Subsoil:
18 to 25 inches—mottled, yellowish brown and light yellowish brown, strongly acid loam
25 to 60 inches—mottled, brownish yellow, yellowish brown, and light brownish gray, very strongly acid loam
60 to 80 inches—mottled, brownish yellow and light gray, strongly acid clay

Niwana

Surface layer:
0 to 3 inches—very dark grayish brown, very strongly acid very fine sandy loam

Subsurface layer:
3 to 17 inches—pale brown, very strongly acid very fine sandy loam

Subsoil:
17 to 80 inches—mottled, yellowish brown and brownish yellow, very strongly acid loam and sandy clay loam

Soil Properties

Depth: Very deep
Drainage class: Kirbyville—moderately well drained; Niwana—well drained
Water table: Kirbyville—from a depth of 1.5 to 3 feet during January to March; Niwana—from a depth of 4 feet to more than 6 feet during January and February
Flooding: None
Runoff: Very low
Permeability: Moderate
Available water capacity: Kirbyville—high; Niwana—high
Root zone: Very deep
Salinity: Nonsaline

Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Kirbyville soil and similar soils: 50 to 65 percent
The Niwana soil and similar soils: 25 to 35 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Kountze soils have less than 18 percent clay in the subsoil and are on similar positions to Kirbyville and Niwana soils.
- The well drained Otanya soils are on higher positions than those of Kirbyville and Niwana soils.
- The poorly drained Sorter soils are in lower positions than those of Kirbyville and Niwana soils.
- The Waller soils have gray subsoils and are in depressions.

Land Uses

Major land use: Woodland
Other land uses: Pasture, wildlife habitat, urban development, recreation

Management Concerns

Woodland

Major limitations:

- There are no major limitations.

Minor limitations:

- The seasonal high water table and wetness in the Kirbyville soils limits the use of equipment.

Pasture

Major limitations:

- There are no major limitations.

Minor limitations:

- The seasonal high water table and wetness in the Kirbyville soils limits the use of equipment.

Wildlife Habitat

Major limitations:

- There are no major limitations.

Urban Development

Major limitations:

- There are no major limitations.

Minor limitations:

- The seasonal high water table and wetness in the Kirbyville soils limits most urban uses.

Recreation

Major limitations:

- There are no major limitations.

Interpretive Groups

Land capability classification: Kirbyville soil—2w; Niwana soil—2w
Woodland group: Kirbyville soil—2; Niwana soil—1

KzB—Kountze very fine sandy loam, 0 to 2 percent slopes

Setting

Landscape: Inland dissected Coastal Plain
Landform: Broad ridge
Slope: Nearly level and very gently sloping
Shape of areas: Irregular
Size of areas: 15 to 500 acres

Typical Profile

Surface layer:
0 to 6 inches—brown, strongly acid very fine sandy loam

Subsurface layer:
6 to 17 inches—light yellowish brown, strongly acid very fine sandy loam
17 to 25 inches—mottled, light yellowish brown and strong brown, very strongly acid very fine sandy loam

Subsoil:
25 to 43 inches—mottled, reddish yellow and pale brown, very strongly acid loam
43 to 54 inches—mottled, brownish yellow and gray, very strongly acid loam
54 to 80 inches—mottled, brownish yellow and light gray, very strongly acid loam

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: A seasonal high water table is at a depth of 1.5 to 3.5 feet during January to March.
Flooding: None
Runoff: Low
Permeability: Moderate
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

Kountze soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The very poorly drained Jayhawker soils are in lower positions.
- The moderately well drained Kirbyville soils have more than 18 percent clay in the subsoil and are on similar positions.
- The poorly drained Plank, Sorter, and Waller soils are in lower positions.

Land Uses

Major land use: Woodland
Other land uses: Pasture, wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- There are no major limitations.

Minor limitations:
- The low fertility in the surface and subsoil limits tree establishment and growth.
- The seasonal high water table limits the use of equipment.

Pasture
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits the use of equipment.
- The seasonal high water table limits plant growth and yield.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits the establishment and growth of plants used for food and cover.

Urban Development
Major limitations:
- The seasonal high water table limits most urban uses.
- These soils are highly corrosive to steel and concrete.

Recreation
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits the use of these soils for recreation.

Interpretive Groups

Land capability classification: 2w
Woodland group: 2

LdA—Labelle-Levac complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Labelle—intermound; Levac—leveled mound
Slope: Nearly level
Shape of areas: Areas are defined by the boundaries of a cropped field
Size of areas: 25 to 200 acres

Typical Profile

Labelle

Surface layer:
0 to 9 inches—very dark gray, strongly acid silt loam

Subsurface layer:
9 to 16 inches—black, moderately acid silty clay loam

Subsoil:
16 to 24 inches—mottled, very dark gray, neutral silty clay
24 to 64 inches—mottled, gray, neutral silty clay
64 to 80 inches—mottled, light gray, slightly alkaline clay

Levac

Surface layer:
0 to 4 inches—very dark grayish brown, neutral silt loam

Subsurface layer:
4 to 13 inches—mottled, grayish brown, slightly alkaline silt loam

Subsoil:
13 to 17 inches—mottled, grayish brown, slightly alkaline silty clay loam
17 to 72 inches—mottled, light brownish gray, slightly alkaline silty clay
72 to 80 inches—light brownish gray, slightly alkaline clay

Soil Properties

Depth: Very deep
Drainage class: Somewhat poorly drained
Water table: Labelle and Levac soils—from a depth of 0.5 foot to 2 feet below the surface during January to March
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Labelle: surface—moderate, subsoil—high; Levac: surface—low, subsoil—high
Water erosion hazard: Slight

Composition

The Labelle soil and similar soils: 65 to 70 percent
The Levac soil and similar soils: 20 to 25 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The grayer Aris soils are in slightly lower positions.
- The Spindletop soils are on mounds that have not been leveled.

Land Uses

Major land use: Pasture
Other land uses: Cropland, woodland, wildlife habitat, urban development, recreation

Management Concerns

Pasture
Major limitations:
- The seasonal high water table limits the use of equipment.
- The seasonal high water table limits the establishment, growth, and yield of plants used for pasture.

Cropland
Major limitations:
- The seasonal high water table limits seedbed preparation, planting time, growth, and yield.

Woodland
Major limitations:
- The seasonal high water table limits the use of equipment.

Minor limitations:
- Plant competition limits the establishment of pine stands.
- The alkaline subsoil limits tree growth.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits the establishment, growth, and yield of plants used for food and cover.

Urban Development
Major limitations:
- The seasonal high water table limits the use for most urban uses.
- The high shrink-swell in the subsoil limits the use for buildings and roads.
- These soils are highly corrosive to steel.

Recreation
Major limitations:
- The seasonal high water table limits the use of these soils for recreational uses.

Interpretive Groups

Land capability classification: Labelle soil—3w; Levac soil—3w
Woodland group: Labelle soil—11; Levac soil—none assigned

LsA—Labelle-Spindletop complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Labelle—flat; Spindletop—mound
Slope: Nearly level
Shape of areas: Irregular but some areas have linear boundaries when next to a leveled field.
Size of areas: 25 to 200 acres

Typical Profile

Labelle

Surface layer:
0 to 9 inches—very dark gray, strongly acid silt loam

Subsurface layer:
9 to 16 inches—black, moderately acid silty clay loam

Subsoil:
16 to 24 inches—mottled, very dark gray, neutral silty clay
24 to 64 inches—mottled, gray, neutral silty clay
64 to 80 inches—mottled, light gray, slightly alkaline clay

Spindletop

Surface layer:
0 to 10 inches—very dark grayish brown, strongly acid silt loam

Subsurface layer:
10 to 21 inches—dark grayish brown, strongly acid silt loam

Subsoil:
21 to 26 inches—mottled, dark grayish brown, slightly acid silty clay loam
26 to 34 inches—mottled, gray, slightly acid clay
34 to 80 inches—mottled, gray, slightly acid silty clay

Soil Properties

Depth: Very deep
Drainage class: Labelle—somewhat poorly drained; Spindletop—moderately well drained
Water table: Labelle—from a depth of 0.5 foot to 2 feet below the surface during January to March; Spindletop—from a depth of 1.5 to 3.5 feet below the surface during January to March
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Labelle: surface—moderate, subsoil—high; Spindletop: surface—low, subsoil—high
Water erosion hazard: Slight

Composition

The Labelle soil and similar soils: 65 to 70 percent
The Spindletop soil and similar soils: 20 to 25 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The grayer Aris soils are in slightly lower positions than those of Labelle soils.
- The grayer Leton soils are in meander channels.

Land Uses

Major land use: Pasture
Other land uses: Cropland, woodland, wildlife habitat, urban development, recreation

Management Concerns

Pasture
Major limitations:
- The seasonal high water table in the Labelle soils limits the use of equipment.
- The seasonal high water table in the Labelle soils limits the establishment, growth, and yield of plants used for pasture.

Minor limitations:
- The mounded Spindletop soils limit the use of equipment.

Cropland
Major limitations:
- The seasonal high water table in the Labelle soils limits seedbed preparation, planting time, growth, and yield.

Minor limitations:

- The mounded Spindletop soils limits the use of equipment.

Woodland
Major limitations:

- The seasonal high water table in the Labelle soils limits the use of equipment.

Minor limitations:

- Plant competition limits the establishment of pine stands.
- The alkaline subsoil limits tree growth.
- The mounded Spindletop soils limits the use of equipment.

Wildlife Habitat
Major limitations:

- There are no major limitations.

Minor limitations:

- The seasonal high water table in the Labelle soils limits the establishment, growth, and yield of plants used for food and cover.

Urban Development
Major limitations:

- The seasonal high water table in the Labelle soils limits the use for most urban uses.
- The high shrink-swell in the subsoil of Labelle soils limits the use for buildings and roads.
- The Labelle soils are highly corrosive to steel and the Spindletop soils are highly corrosive to steel and concrete.

Recreation
Major limitations:

- The seasonal high water table in the Labelle soils limits the use of these soils for recreational uses.

Interpretive Groups

Land capability classification: Labelle soil—3w; Spindletop soil—2w
Woodland group: Labelle soil—11; Spindletop soil—none assigned

LtA—League clay, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Flats
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 15 to 700 acres

Typical Profile

Surface layer:
0 to 13 inches—very dark gray, very strongly acid clay

Subsoil:
13 to 28 inches—mottled, very dark gray, moderately acid clay
28 to 45 inches—mottled, dark gray, slightly acid clay
45 to 80 inches—mottled, gray, slightly acid clay

Soil Properties

Depth: Very deep
Drainage class: Somewhat poorly drained
Water table: A seasonal high water table is at a depth of 0.5 to 1.5 feet during January to March.
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: High
Soil reaction: Very strongly acid
Salinity: Nonsaline
Shrink-swell potential: Very high
Water erosion hazard: Slight

Composition

The League soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Contrasting Inclusions

- The poorly drained Beaumont soils are in slightly lower positions.
- The loamy surfaced Labelle soils are on similar positions.

Land Uses

Major land use: Pasture
Other land uses: Cropland, woodland, wildlife habitat, urban development, recreation

Management Concerns

Pasture
Major limitations:
- The clayey surface layer limits the use of equipment during extremely wet or dry conditions.
- The seasonal high water table and wetness limits plant growth and yield.

Cropland
Major limitations:
- The clayey surface layer limits the use of equipment during extremely wet or dry conditions.
- The seasonal high water table limits seedbed preparation, planting time, growth, and yield.

Woodland
Major limitations:
- The seasonal high water table limits the use for woodland management.
- The clayey surface layer limits the use for woodland management during extremely wet or dry conditions.

Minor limitations:
- Plant competition limits the development of pine stands.

Wildlife Habitat
Major limitations:
- The clayey surface layer limits the use of equipment for establishing food and cover plants during extremely wet or dry conditions.
- The seasonal high water table limits plants grown for food and cover for wildlife.

Urban Development
Major limitations:
- The clayey surface and subsoil, high shrink-swell, compaction, and difficulty in excavation limit most urban uses.
- The seasonal high water table limits most urban uses.
- These soils are highly corrosive to steel and concrete.

Recreation
Major limitations:
- The seasonal high water table limits recreational uses.
- The clayey surface layer limits recreational uses during extremely wet and dry conditions because of compaction and low trafficability.

Interpretive Groups

Land capability classification: 3w
Woodland group: 11

LvA—Lelavale loam, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Depression
Slope: Nearly level
Shape of areas: Oval
Size of areas: 8 to 50 acres

Typical Profile

Surface layer:
0 to 4 inches—mottled, dark gray, extremely acid loam

Subsurface layer:
4 to 12 inches—mottled, light brownish gray, extremely acid silt loam

Subsoil:
12 to 16 inches—mottled, gray and light brownish gray, extremely acid loam
16 to 41 inches—mottled, gray and light brownish gray, extremely acid clay loam
41 to 49 inches—mottled, brownish yellow, yellowish red, and red, extremely acid clay
49 to 57 inches—mottled, light gray, extremely acid clay
57 to 80 inches—mottled, light gray and yellow, extremely acid clay loam

Soil Properties

Depth: Very deep
Drainage class: Very poorly drained
Water table: A seasonal high water table exists from the surface to 6 feet below the surface during November to June.
Ponding: From the surface to 1 foot above the surface during October to June for long duration
Flooding: None
Runoff: Negligible
Permeability: Very slow
Available water capacity: High
Root zone: Very deep

Salinity: Very slight
Shrink-swell potential: surface—low; subsoil—high
Water erosion hazard: Slight

Composition

The Lelavale soil and similar soils: 95 to 100 percent
Contrasting inclusions: 0 to 5 percent

Contrasting Inclusions

- The Jayhawker soils have a fragipan at 69 inches and are on slightly higher positions.
- The Jasco soils have a fragipan and are in slightly lower positions.

Land Uses

Major land use: Wildlife habitat

Management Concerns

Wildlife Habitat
Major limitations:
- Ponding or seasonal high water table limits wildlife habitat management.

Interpretive Groups

Land capability classification: 6w
Woodland group: 21

LwA—Leton silt loam, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Depression
Slope: Nearly level
Shape of areas: Long and narrow
Size of areas: 100 to 200 acres

Typical Profile

Surface layer:
0 to 4 inches—mottled, dark grayish brown, very strongly acid silt loam

Subsurface layer:
4 to 28 inches—mottled, gray and light gray, moderately acid to extremely acid silt loam

Subsoil:
28 to 49 inches—mottled, gray and light gray, very strongly acid silt loam
49 to 80 inches—mottled, gray and light gray, very strongly acid to extremely acid silty clay loam

Soil Properties

Depth: Very deep
Drainage class: Poorly drained
Water table: A seasonal high water table exists from the surface to more than 6 feet below the surface during October to May.
Ponding: From the surface to 1 foot above the surface during September to May.
Flooding: None

Runoff: Very low
Permeability: Slow
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Moderate
Water erosion hazard: Slight

Composition

The Leton soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Aris soils have clayey subsoils and are on slightly higher positions.

Land Uses

Major land use: Pasture
Other land uses: Wildlife habitat, urban development

Management Concerns

Pasture
Major limitations:
- The seasonal high water table limits the use of equipment on this soil.
- The seasonal high water table limits the establishment, growth, and yield of plants used for pasture.

Wildlife Habitat
Major limitations:
- The seasonal high water table limits wildlife habitat management.
- The seasonal high water table limits the establishment, growth, and yield of plants used for wildlife.

Urban Development
Major limitations:
- The seasonal high water table limits the use for most urban uses.
- These soils are highly corrosive to steel.

Interpretive Groups

Land capability classification: 5w
Woodland group: 13

MaA—Manco loam, 0 to 1 percent slopes, frequently flooded

Setting

Landscape: River valley on Coastal Plain
Landform: Flood plain
Slope: Nearly level
Shape of areas: Long and narrow along rivers and streams
Size of areas: 100 to 2,000 acres

Typical Profile

Surface layer:
0 to 4 inches—mottled, dark grayish brown, very strongly acid loam

Subsoil:
4 to 19 inches—mottled, pale brown, extremely acid loam
19 to 45 inches—mottled, gray and light brownish gray, very strongly acid loam
45 to 80 inches—mottled, light gray and gray, very strongly acid loam

Soil Properties

Depth: Very deep
Drainage class: Somewhat poorly drained
Water table: A seasonal high water table exists from 1 foot to more than 6 feet below the surface during December to May.
Flooding: Frequently for long periods during November to May
Runoff: Negligible
Permeability: Moderate
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Moderate
Water erosion hazard: Slight

Composition

The Manco soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The clayey Estes soils are on similar positions.
- The loamy Iulus soils have brown subsoils and are on natural levees.
- The loamy Bleakwood soils have grayer topsoil and upper subsoils and are on similar positions.

Land Uses

Major land use: Wildlife habitat
Other land uses: Woodland, urban development, recreation

Management Concerns

Wildlife Habitat
Major limitations:
- Flooding or the seasonal high water table limits wildlife habitat management.

Woodland
Major limitations:
- Flooding or the seasonal high water limits woodland management.

Urban Development
Major limitations:
- Flooding makes this soil unsuitable for most urban uses.

Recreation
Major limitations:
- Flooding or the seasonal high water table limits recreational use.

Interpretive Groups

Land capability classification: 5w
Woodland group: 5

McC—McNeely sand, 1 to 5 percent slopes

Setting

Landscape: River valley on Coastal Plain
Landform: Terrace riser
Slope: Very gently and gently sloping
Shape of areas: Irregular
Size of areas: 35 to 300 acres

Typical Profile

Surface layer:
0 to 5 inches—very dark grayish brown, very strongly acid sand

Subsoil:
5 to 37 inches—brown and light yellowish brown, strongly acid sand
37 to 72 inches—very pale brown, strongly acid sand
72 to 80 inches—dark yellowish brown, strongly acid sand

Soil Properties

Depth: Very deep
Drainage class: Excessively drained
Water table: Greater than 6 feet
Flooding: None
Runoff: Negligible
Permeability: Very rapid
Available water capacity: Low
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The McNeely soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The very poorly drained Caneyhead soils are in depressions.
- The loamy Belrose soils are on ridges.
- The Turkey soils have redder subsoils and are on similar to slightly lower positions.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- During dry conditions, the sandy soil limits prescribed burning, seedling establishment, and tree growth because of droughtiness.
- The sandy surface texture severely limits the use for chemical site preparation because of excess permeability.

Minor limitations:

- The sandy surface texture limits the use of equipment during dry conditions.

Wildlife Habitat
Major limitations:

- During dry conditions, the sandy surface and subsoil limits the establishment, growth, and yield of plants used for food and cover because of droughtiness.

Urban Development
Major limitations:

- The sandy texture limits most urban uses.

Recreation
Major limitations:

- During dry conditions, the sandy soil limits the establishment and growth of plants.

Interpretive Groups

Land capability classification: 4s
Woodland group: 18

NdA—Nona-Dallardsville complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Nona—flats; Dallardsville—pimple mounds
Slope: Nearly level and very gently sloping
Shape of areas: Irregular
Size of areas: 50 to 300 acres

Typical Profile

Nona

Surface layer:
0 to 3 inches—crawfish disturbed, mottled grayish brown, extremely acid very fine sandy loam

Subsoil:
3 to 19 inches—crawfish disturbed, mottled gray and light brownish gray, very strongly acid very fine sandy loam
19 to 38 inches—crawfish disturbed, mottled gray, very strongly acid loam
38 to 80 inches—mottled, gray and light gray, very strongly acid to extremely acid clay loam and loam

Dallardsville

Surface layer:
0 to 7 inches—yellowish brown, extremely acid very fine sandy loam

Subsurface layer:
7 to 38 inches—mottled, pink and reddish yellow, extremely acid very fine sandy loam

Subsoil:
38 to 61 inches—mottled, light yellowish brown, brownish yellow, pink, and light gray, very strongly acid very fine sandy loam
61 to 75 inches—mottled, slightly brittle, brownish yellow and light gray, very strongly acid very fine sandy loam
75 to 80 inches—mottled, brittle reddish yellow, very strongly acid very fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Nona—poorly drained; Dallardsville—moderately well drained
Water table: Nona—a seasonal high water table exists from the surface to 1 foot below the surface during November to April; Dallardsville—a seasonal high water table exists from 3 to 4 feet below the surface during December to March.
Flooding: None
Runoff: Nona—negligible; Dallardsville—low
Permeability: Nona—slow; Dallardsville—moderately slow
Available water capacity: Nona—moderate; Dallardsville—high
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Nona soil and similar soils: 65 to 70 percent
The Dallardsville soil and similar soils: 20 to 25 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The moderately well drained Kirbyville soils are on ridges.
- The Jasco soils have a fragipan and are in depressions.
- The Plank soils have less clay in the subsoil and are on positions similar to those of Nona soils.
- The Waller soils have a lower exchangeable sodium percentage and are on positions similar to those of Nona soils.

Land Uses

Major land use: Wildlife habitat
Other land uses: Woodland, urban development, recreation

Management Concerns

Wildlife Habitat
Major limitations:
- The seasonal high water table in the Nona soils limits wildlife habitat management.
- The high exchangeable sodium percentage in the Nona soils limits the selection and growth of plants used for wildlife habitat.

Woodland
Major limitations:
- The seasonal high water table in the Nona soils limits woodland management.
- The high exchangeable sodium percentage in the Nona soils limits woodland management

Urban Development
Major limitations:
- The seasonal high water table in the Nona soils limits most urban uses.
- The high exchangeable sodium percentage in the Nona soils limits the selection and growth of plants used for landscaping.

Minor limitations:

- The seasonal high water table in Dallardsville soils limits the use for septic tank adsorption fields and for excavation of pits and trenches.

Recreation

Major limitations:

- The seasonal high water table in Nona soils limits the use for most recreational uses.
- The high exchangeable sodium percentage in the Nona soils limits the selection and growth of plants used for recreational uses.

Minor limitations:

- The seasonal high water table in Dallardsville soils limits playgrounds, picnic areas, and camp areas.

Interpretive Groups

Land capability classification: Nona soil—7w; Dallardsville soil—2w
Woodland group: Nona soil—17; Dallardsville soil—9

Oa—Oil-waste land

This unit consists of areas where oil and sulfur related products have accumulated from drilling activities. It includes active or abandoned areas. The mapped areas range from 15 to several hundred acres.

Oil-waste land is not suited to cropland, pasture, woodland, urban development, or woodland. Most areas have existed for many years and are difficult to reclaim.

Oil-waste land has not been assigned to a capability subclass, ecological site, or woodland group.

OeA—Olive silt loam, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Depressions
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 15 to 200 acres

Typical Profile

Surface layer:
0 to 14 inches—mottled, dark grayish brown, ultra acid silt loam

Subsurface layer:
14 to 22 inches—mottled, light gray, ultra to extremely acid silt loam

Subsoil:
22 to 65 inches—mottled, light gray, noncemented, extremely acid fine sandy loam
65 to 80 inches—mottled, light gray and light brownish gray, noncemented, extremely acid fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Very poorly drained
Water table: A seasonal high water table exists from the surface to 2 feet below the surface during January to December.
Ponding: From 0.5 foot to 1.5 feet above the surface during November to May

Flooding: None
Runoff: Negligible
Permeability: Very slow
Available water capacity: Low
Root zone: Moderately deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

Olive soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Babco soils have sandy surfaces and are on mounds.
- The Dallardsville soils do not have a fragipan and are on mounds.
- The Jayhawker soils have a fragipan below 60 inches and are on similar positions.
- The Jasco soils have a fragipan above 30 inches and are on similar positions.
- The poorly drained Sorter soils are on slightly higher positions.
- The Tyden soils do not have a fragipan and are on similar positions to Olive soils.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- Ponding or the seasonal high water table limits the use for woodland management.

Minor limitations:
- The rooting depth limits tree growth because of a restrictive layer.

Wildlife Habitat
Major limitations:
- Ponding or the seasonal high water table limits wildlife management.

Minor limitations:
- The rooting depth limits plant growth because of a restrictive layer.

Urban Development
Major limitations:
- Ponding or the seasonal high water table makes this soil unsuitable for most urban uses.

Recreation
Major limitations:
- Ponding or the seasonal high water table limits recreational uses.

Interpretive Groups

Land capability classification: Olive soil—6w
Woodland group: 12

OvA—Olive-Dallardsville complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Olive—depression; Dallardsville—pimple mounds
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 15 to 2,000 acres

Typical Profile

Olive

Surface layer:
0 to 14 inches—mottled, dark grayish brown, ultra acid silt loam

Subsurface layer:
14 to 22 inches—mottled, light gray, ultra to extremely acid silt loam

Subsoil:
22 to 65 inches—mottled, light gray, noncemented, extremely acid fine sandy loam
65 to 80 inches—mottled, light gray and light brownish gray, noncemented, extremely acid silt loam

Dallardsville

Surface layer:
0 to 7 inches—yellowish brown, extremely acid very fine sandy loam

Subsurface layer:
7 to 38 inches—mottled, pink and reddish yellow, extremely acid very fine sandy loam
Subsoil:
38 to 61 inches—mottled, light yellowish brown, brownish yellow, pink, and light gray, very strongly acid very fine sandy loam
61 to 75 inches—mottled, slightly brittle, brownish yellow and light gray, very strongly acid very fine sandy loam
75 to 80 inches—mottled, brittle reddish yellow, very strongly acid very fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Olive—very poorly drained; Dallardsville—moderately well drained
Water table: Olive—a seasonal high water table exists from the surface to 5 feet below the surface during January to December; Dallardsville—a seasonal high water table exists from 3 to 4 feet below the surface during December to March.
Ponding: Olive—from 0.5 foot to 1.5 feet above the surface during November to June; Dallardsville—none
Flooding: None
Runoff: Olive—negligible; Dallardsville—low
Permeability: Olive—very slow; Dallardsville—moderately slow
Available water capacity: Olive—low; Dallardsville—high
Root zone: Olive—moderately deep; Dallardsville—very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

Olive soil and similar soils: 45 to 55 percent
Dallardsville soil and similar soils: 35 to 40 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The Babco soils have sandy surface layers and are on positions similar to those of Dallardsville soils.
- The Jayhawker soils have a fragipan below 60 inches and are on positions similar to those of Olive soils.
- The Jasco soils have a fragipan above 30 inches and are on positions similar to those of Olive soils.
- The poorly drained Sorter soils are on slightly higher positions than those of Olive soils.
- The Tyden soils do not have a fragipan and are on positions similar to Olive soils.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- Ponding or the seasonal high water table in the Olive soils limits the use for woodland management.

Minor limitations:
- The rooting depth in the Olive soils limits tree growth because of a restrictive layer.

Wildlife Habitat
Major limitations:
- Ponding or the seasonal high water table in the Olive soils limits wildlife management.

Minor limitations:
- The rooting depth in the Olive soils limits plant growth because of a restrictive layer.

Urban Development
Major limitations:
- Ponding or seasonal high water table in the Olive soils makes this soil unsuitable for most urban uses.

Recreation
Major limitations:
- Ponding or the seasonal high water table in the Olive soils limits recreational uses.

Interpretive Groups

Land capability classification: Olive soil—6w; Dallardsville soil—2w
Woodland group: Olive soil—12; Dallardsville soil—9

OyB—Otanya fine sandy loam, 1 to 3 percent slopes

Setting

Landscape: Inland dissected Coastal Plain
Landform: Backslopes and shoulders
Slope: Very gently sloping
Shape of areas: Irregular
Size of areas: 15 to 200 acres

Typical Profile

Surface layer:
0 to 5 inches—very dark grayish brown, extremely acid fine sandy loam

Subsurface layer:
5 to 23 inches—brown, very strongly acid fine sandy loam

Subsoil:
23 to 44 inches—mottled, yellowish brown, extremely acid sandy clay loam
44 to 74 inches—mottled, brownish yellow, extremely acid sandy clay loam
74 to 80 inches—mottled, brownish yellow and light gray, extremely acid sandy clay loam

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: A seasonal high water table exists from 4.5 feet to 6 feet below the surface during January to March.
Flooding: None
Runoff: Very low
Permeability: Moderately slow
Available water capacity: Moderate
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Otanya soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The moderately well drained Kirbyville and Kountze soils are in lower positions.
- The very poorly drained Lelavale soils are in depressions.
- The Niwana soils are on mounds.
- The Silsbee soils have redder subsoils and are on similar positions.
- The poorly drained Waller soils are in lower positions.

Land Uses

Major land use: Woodland
Other land uses: Pasture, wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- There are no major limitations.

Pasture
Major limitations:
- There are no major limitations.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Urban Development
Major limitations:
- There are no major limitations.

Recreation
Major limitations:
- There are no major limitations.

Minor limitations:
- Slope limits the use for playgrounds because of difficulty leveling play areas and the erosion hazard under heavy foot traffic.

Interpretive Groups

Land capability classification: 2e
Woodland group: 6

OyC—Otanya fine sandy loam, 3 to 5 percent slopes

Setting

Landscape: Inland dissected Coastal Plain
Landform: Backslopes and shoulders
Slope: Gently sloping
Shape of areas: Irregular
Size of areas: 15 to 200 acres

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown, extremely acid fine sandy loam

Subsurface layer:
6 to 12 inches—brown, very strongly acid fine sandy loam
12 to 19 inches—yellowish brown, extremely acid fine sandy loam

Subsoil:
19 to 28 inches—mottled, yellowish brown, extremely acid sandy clay loam
28 to 80 inches—mottled, brownish yellow and light gray, extremely acid sandy clay loam

Soil Properties

Depth: Very deep
Drainage class: Well drained

Water table: A seasonal high water table exists from 4.5 feet to 6 feet below the surface from January to March.
Flooding: None
Runoff: Low
Permeability: Moderately slow
Available water capacity: Moderate
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Otanya soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The moderately well drained Kirbyville soils are in lower positions.
- The Niwana soils are on mounds.
- The Silsbee soils have redder subsoils and are on higher positions.

Land Uses

Major land use: Woodland
Other land uses: Pasture, wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- There are no major limitations.

Pasture
Major limitations:
- There are no major limitations.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Urban Development
Major limitations:
- There are no major limitations.

Recreation
Major limitations:
- There are no major limitations.

Minor limitations:
- Slope limits the use for playgrounds because of difficulty leveling play areas and the erosion hazard under heavy foot traffic.

Interpretive Groups

Land capability classification: 3e
Woodland group: 6

PkA—Plank silt loam, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Broad flats
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 5,000 acres

Typical Profile

Surface layer:
0 to 3 inches—mottled, crawfish disturbed, grayish brown, extremely acid silt loam

Subsoil:
3 to 35 inches—mottled, crawfish disturbed, light brownish gray and light gray, extremely acid silt loam
35 to 80 inches—mottled, crawfish disturbed, grayish brown and light brownish gray, extremely acid silt loam

Soil Properties

Depth: Very deep
Drainage class: Poorly drained
Water table: A seasonal high water table exists from 0 foot to 3.5 feet during November to May.
Flooding: None
Runoff: Low
Permeability: Slow
Available water capacity: Moderate
Root zone: Very deep
Salinity: Very slight
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Plank soil and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The moderately well drained Dallardsville soils are on mounds.
- The Jayhawker and Sorter soils with fragipans are on similar positions.
- The moderately well drained Kountze soils are on higher positions.
- The Olive soils with a fragipan are in depressions.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- The seasonal high water table limits the use for woodland management.
- Salinity in the subsoil severely limits woodland use.

Minor limitations:
- The loamy surface texture limits the use for log landings because of excess fines.

Wildlife Habitat
Major limitations:
- The seasonal high water table limits the use for wildlife habitat management.
- During dry conditions, droughtiness limits plant growth.
- Salinity severely limits the growth and yield of plants used for food and cover.

Urban Development
Major limitations:
- The seasonal high water table limits most urban uses.
- These soils are highly corrosive to steel and concrete.
- Salinity limits the growth of plants used for lawns, landscaping, and golf fairways.
- During dry conditions, droughtiness limits growth of plants used for lawns, landscaping, and golf fairways.

Recreation
Major limitations:
- The seasonal high water table limits recreational uses.
- During dry conditions, droughtiness limits growth of plants used for lawns, landscaping, and golf fairways.
- Salinity limits the growth of plants used in recreational landscaping.

Interpretive Groups

Land capability classification: 4w
Woodland group: 17

SbC—Silsbee fine sandy loam, 3 to 5 percent slopes

Setting

Landscape: Inland dissected Coastal Plain
Landform: Backslopes
Slope: Gently sloping
Shape of areas: Irregular
Size of areas: 20 to 200 acres

Typical Profile

Surface layer:
0 to 5 inches—brown, very strongly acid fine sandy loam

Subsurface layer:
5 to 15 inches—light yellowish brown and pale brown, very strongly acid fine sandy loam

Subsoil:
15 to 49 inches—yellowish red, strongly acid sandy clay loam
49 to 58 inches—strong brown, strongly acid sandy clay loam
58 to 80 inches—mottled, strong brown, strongly acid sandy clay loam

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: Greater than 6 feet
Flooding: None
Runoff: Low
Permeability: Moderate
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Silsbee soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Contrasting Inclusions

- The moderately well drained Kirbyville and Kountze soils are in lower positions.
- The Otanya soils have yellow subsoils and are on similar positions.

Land Uses

Major land use: Woodland
Other land uses: Pasture, wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:

- There are no major limitations.

Pasture
Major limitations:

- There are no major limitations.

Minor limitations:

- During dry conditions, doughtiness limits the growth of plants.

Wildlife Habitat
Major limitations:

- There are no major limitations.

Urban Development
Major limitations:

- There are no major limitations.

Minor limitations:

- Slope limits the use of these soils for buildings because of difficulty in leveling and excavation.

Recreation
Major limitations:

- There are no major limitations.

Minor limitations:

- Slope limits the use for playgrounds because of difficulty leveling play areas and the erosion hazard under heavy foot traffic.

Interpretive Groups

Land capability classification: 3e
Woodland group: 6

SbD—Silsbee fine sandy loam, 5 to 12 percent slopes

Setting

Landscape: Inland dissected Coastal Plain
Landform: Backslopes
Slope: Moderately sloping to strongly sloping
Shape of areas: Irregular
Size of areas: 20 to 500 acres

Typical Profile

Surface layer:
0 to 5 inches—brown, very strongly acid fine sandy loam

Subsurface layer:
5 to 15 inches—light yellowish brown and pale brown, very strongly acid fine sandy loam

Subsoil:
15 to 49 inches—yellowish red, strongly acid sandy clay loam
49 to 58 inches—strong brown, strongly acid sandy clay loam
58 to 80 inches—mottled, strong brown, strongly acid sandy clay loam

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: Greater than 6 feet
Flooding: None
Runoff: Medium
Permeability: Moderate
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Moderate

Composition

The Silsbee soil and similar soils: 95 to 100 percent
Contrasting inclusions: 0 to 5 percent

Contrasting Inclusions

- The moderately well drained Kirbyville soils are in lower positions.
- The Otanya soils have yellow subsoils and are on similar to higher positions.

Land Uses

Major land use: Woodland
Other land uses: Pasture, wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- There are no major limitations.

Minor limitations:
- Slope limits the use of equipment.

Pasture
Major limitations:
- There are no major limitations.

Minor limitations:
- During dry conditions, droughtiness limits plant growth.
- Slope limits the use of equipment.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Urban Development
Major limitations:
- There are no major limitations.

Minor limitations:
- Slope limits the use for buildings because of difficulty in leveling and excavation.

Recreation
Major limitations:
- There are no major limitations.

Minor limitations:
- Slope limits playgrounds because of difficulty leveling play areas and the erosion hazard under heavy foot traffic.

Interpretive Groups

Land capability classification: 6e
Woodland group: 6

SdA—Sorter-Dallardsville complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Sorter—intermound; Dallardsville—pimple mound
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 5,000 acres

Typical Profile

Sorter

Surface layer:
0 to 3 inches—mottled, dark grayish brown, extremely acid very fine sandy loam

Subsoil:
3 to 41 inches—mottled, crawfish disturbed, gray, very strongly acid very fine sandy loam
41 to 78 inches—mottled, crawfish disturbed, light gray and pink, very strongly acid very fine sandy loam
78 to 80 inches—mottled, brittle, pinkish gray and light brownish gray, strongly acid very fine sandy loam

Dallardsville
Surface layer:
0 to 7 inches—yellowish brown, extremely acid very fine sandy loam

Subsurface layer:
7 to 38 inches—mottled, pink and reddish yellow, extremely acid very fine sandy loam

Subsoil:
38 to 61 inches—mottled, light yellowish brown, brownish yellow, pink, and light gray, very strongly acid very fine sandy loam
61 to 75 inches—mottled, slightly brittle, brownish yellow and light gray, very strongly acid very fine sandy loam
75 to 80 inches—mottled, brittle, reddish yellow, very strongly acid very fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Sorter—poorly drained; Dallardsville—moderately well drained
Water table: Sorter—a seasonal high water exists from the surface to 1.5 feet below the surface during November to May; Dallardsville—a seasonal high water table exists from 3 to 5 feet below the surface during December to March.
Ponding: Sorter—from the surface to 0.5 foot above the surface during December to March; Dallardsville—none
Flooding: None
Runoff: Sorter—negligible; Dallardsville—low
Permeability: Slow
Available water capacity: Sorter—high; Dallardsville—high
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Sorter soil and similar soils: 50 to 55 percent
The Dallardsville soil and similar soils: 35 to 40 percent
Contrasting inclusions: 5 to 10 percent

Contrasting Inclusions

- The Kirbyville soils have heavier loamy subsoils than those of the Dallardsville soils and on very gently sloping broad ridges.
- The Olive soils have a fragipan at 22 inches and are on positions similar to those of Sorter soils.
- The Waller soils have heavier subsoils and are on positions similar to those of Sorter soils.

Land Uses

Major land use: Woodland (fig. 11)
Other land uses: Wildlife habitat, urban development, recreation

Figure 11.—A clear cut in an area of Sorter-Dallardsville complex, 0 to 1 percent slopes.

Management Concerns

Woodland

Major limitations:

- Ponding and the seasonal high water table in the Sorter soils limits woodland management.
- Salinity in the Sorter soils limits tree growth.

Wildlife Habitat

Major limitations:

- Ponding and the seasonal high water table in the Sorter soils limits wildlife habitat management.
- Salinity in the Sorter soils limits the growth of plants used for food and cover.

Urban Development

Major limitations:

- Ponding and the seasonal high water table limits most urban uses.
- Salinity in the Sorter soils limits the growth of plants used in landscaping.
- These soils are highly corrosive to steel and concrete.

Minor limitations:

- During dry conditions, droughtiness in the Dallardsville soils limits plant growth.

Recreation

Major limitations:

- Ponding and the seasonal high water table in the Sorter soils limits recreational uses.
- Salinity in the Sorter soils limits the growth of plants used in recreational landscaping.

Minor limitations:

- During dry conditions, droughtiness in the Dallardsville soils limits growth of plants used in recreational landscaping.

Interpretive Groups

Land capability classification: Sorter soil—4w; Dallardsville soil—2w
Woodland group: Sorter soil—16; Dallardsville soil—9

SpB—Spurger very fine sandy loam, 0 to 2 percent slopes

Setting

Landscape: River valley on flat Coastal Plain
Landform: Terrace riser
Slope: Very gently sloping
Shape of areas: Irregular
Size of areas: 15 to 400 acres

Typical Profile

Surface layer:
0 to 5 inches—brown, very strongly acid very fine sandy loam

Subsurface layer:
5 to 11 inches—mottled, light yellowish brown, very strongly acid very fine sandy loam

Subsoil:
11 to 58 inches—mottled, red, very strongly acid clay
58 to 74 inches—mottled, gray and strong brown, very strongly acid sandy clay loam
74 to 80 inches—mottled, brownish yellow and light gray, very strongly acid loamy fine sand

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: A seasonal high water table exists from a depth of 5 feet to more than 6 feet below the surface during December to February.
Flooding: None
Runoff: Low
Permeability: Slow
Available water capacity: Moderate
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Surface—low; Subsoil—high
Water erosion hazard: Slight

Composition

The Spurger soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The loamy Belrose soils are on similar positions.
- The very poorly drained Caneyhead soils are in depressions.
- The loamy Kenefick soils are on similar positions.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits the use of equipment.
- Plant competition limits the establishment of pine stands.

Wildlife Habitat
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits the growth and yield of plants used for food and cover.

Urban Development
Major limitations:
- The seasonal high water table limits septic tank absorption fields.
- These soils are highly corrosive to steel and concrete.

Minor limitations:
- The seasonal high water table limits excavation of pits and trenches.
- The moderate shrink-swell limits the use of the soils for buildings and roads.

Recreation
Major limitations:
- There are no major limitations.

Minor limitations:
- The seasonal high water table limits picnic areas, camp areas, and playgrounds.

Interpretive Groups

Land capability classification: 3e
Woodland group: 2

TuB—Turkey sand, 1 to 3 percent slopes

Setting

Landscape: River valley on Coastal Plain
Landform: Terrace riser
Slope: Very gently sloping
Shape of areas: Irregular
Size of areas: 15 to 300 acres

Typical Profile

Surface layer:
0 to 5 inches—very dark grayish brown, very strongly acid sand

Subsoil:
5 to 10 inches—dark brown, very strongly acid sand
10 to 80 inches—yellowish red and strong brown, very strongly acid sand

Soil Properties

Depth: Very deep
Drainage class: Somewhat excessively drained
Water table: Greater than 6 feet
Flooding: None
Runoff: Negligible
Available water capacity: Low
Root zone: Very deep

Permeability: Moderately rapid
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Turkey soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Contrasting Inclusions

- The loamy Belrose soils are on similar positions.
- The loamy Caneyhead soils are in depressions.
- The loamy Kenefick soils are in lower positions.
- The McNeely soils with yellow subsoils are on similar positions.

Land Uses

Major land use: Woodland (fig. 12)
Other land uses: Wildlife habitat, urban development, recreation

Woodland
Major limitations:
- During dry conditions, the sandy surface and subsoil limits prescribed burning, seedling establishment, and tree growth because of droughtiness.
- The sandy surface texture severely limits the use for chemical site preparation because of excess permeability.
- The sandy surface texture limits the use for equipment use during dry conditions.

Figure 12.—Christmas tree plantation in an area of Turkey sand, 1 to 3 percent slopes.

Wildlife Habitat
Major limitations:
- During dry conditions, the sandy surface and subsoil limits the establishment, growth, and yield of plants used for food and cover because of droughtiness and low fertility.

Urban Development
Major limitations:
- The sandy texture limits most urban uses.

Recreation
Major limitations:
- During dry conditions, the sandy soil limits the establishment and growth of plants.

Interpretive Groups

Land capability classification: 4s
Woodland group: 14

TyA—Tyden-Babco complex, 0 to 1 percent slopes

Setting

Landscape: River valley on Coastal Plain
Landform: Tyden—channels; Babco—ridges
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 200 acres

Typical Profile

Tyden

Surface layer:
0 to 6 inches—black, extremely acid silt loam
6 to 13 inches—very dark gray, extremely acid very fine sandy loam

Subsurface layer:
13 to 19 inches—dark gray and light brownish gray, extremely acid very fine sandy loam

Subsoil:
19 to 41 inches—mottled, grayish brown, dark grayish brown, and light brownish gray, extremely acid fine sandy loam
41 to 73 inches—mottled, light brownish gray, grayish brown, and pinkish gray, extremely acid fine sandy loam
73 to 80 inches—mottled, light brownish gray and pinkish gray, extremely acid loam

Babco

Surface layer:
0 to 8 inches—very dark gray, extremely acid loamy fine sand

Subsurface layer:
8 to 12 inches—light brownish gray, extremely acid loamy fine sand
12 to 16 inches—mottled, dark brown, extremely acid fine sandy loam
16 to 22 inches—mottled, brown, very strongly acid fine sandy loam
22 to 55 inches—mottled, very pale brown and light brownish gray, very strongly acid fine sandy loam

55 to 80 inches—mottled, light brownish gray and light gray, very strongly acid fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Tyden—very poorly drained; Babco—somewhat poorly drained
Water table: Tyden—a seasonal high water tables exists from the surface to 5 feet below the surface during January to December; Babco—a seasonal high water table exists from 2 to 3 feet below the surface during December to April.
Ponding: Tyden—from the surface to 1.5 feet above the surface during November to May; Babco—none
Flooding: None
Runoff: Low
Permeability: Tyden—slow; Babco—moderately slow
Available water capacity: Tyden—high; Babco—moderate
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Tyden soil and similar soils: 55 to 65 percent
The Babco soil and similar soils: 20 to 30 percent
Contrasting inclusions: 5 to 25 percent

Contrasting Inclusions

- The loamy Belrose soils are on positions similar to those of Babco soils.
- The sandy Turkey and Votaw soils are on higher positions than those of Tyden or Babco soils.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- Ponding and the seasonal high water table in the Tyden soils limits woodland management.

Wildlife Habitat
Major limitations:
- Ponding and the seasonal high water table in the Tyden soils limits wildlife habitat management.

Urban Development
Major limitations:
- Ponding and the seasonal high water table in the Tyden soils limits most urban uses.
- These soils are highly corrosive to steel and concrete.

Recreation

Major limitations:

- Ponding and the seasonal high water table in the Tyden soils limits recreational uses.

Interpretive Groups

Land capability classification: Tyden soil—4w; Babco soil—3s
Woodland group: Tyden soil—16; Babco soil—15

VaA—Vamont clay, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Flats
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 500 acres

Typical Profile

Surface layer:
0 to 5 inches—mottled, grayish brown, extremely acid clay

Subsoil:
5 to 19 inches—mottled, reddish yellow and light gray, extremely acid clay
19 to 80 inches—mottled, light gray, extremely acid and very strongly acid clay

Soil Properties

Depth: Very deep
Drainage class: Somewhat poorly drained
Water table: A seasonal high water table exists from the surface to 1.5 feet below the surface during November to March.
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: High
Salinity: None
Shrink-swell potential: Very High
Water erosion hazard: Slight

Composition

The Vamont soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Contrasting Inclusions

- The Bevil soils remain wetter for longer periods and are in lower positions.
- The loamy Evadale and Texla soils are on similar positions.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- The seasonal high water table limits woodland management.
- The clayey surface layer limits this soil during extremely wet or dry conditions.

Minor limitations:
- Plant competition limits the establishment of pine stands.

Wildlife Habitat
Major limitations:
- The clayey surface limits the use of equipment for establishing food and cover plants during extremely wet or dry conditions.
- The seasonal high water table limits plants grown for food and cover for wildlife.

Urban Development
Major limitations:
- The clayey texture, high shrink swell, compaction, and difficulty in excavation limits most urban uses.
- The seasonal high water table limits most urban uses.
- These soils are highly corrosive to steel.

Recreation
Major limitations:
- The seasonal high water table limits recreational uses.
- The clayey surface limits recreational uses during extremely wet or dry conditions because of compaction and low trafficability.

Interpretive Groups

Land capability classification: 4w
Woodland group: 10

VoA—Votaw fine sand, 0 to 1 percent slopes

Setting

Landscape: River valley on Coastal Plain
Landform: Broad flat terrace
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 500 acres

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown and light gray, very strongly acid fine sand

Subsoil:
4 to 29 inches—yellowish brown, moderately acid and strongly acid fine sand
29 to 63 inches—mottled, brownish yellow and light gray, moderately and strongly acid fine sand
63 to 80 inches—mottled, light gray, strongly acid fine sand

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: A seasonal high water table is at a depth of 2 to 3 feet below the surface during December to March.
Flooding: Rare from January to December
Runoff: Negligible
Permeability: Moderately rapid
Available water capacity: Low
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Votaw soil and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The Babco soils have loamy subsoils and are on mounds.
- The loamy Belrose and Kenefick soils are on ridges.
- The very poorly drained, loamy Caneyhead soils are in depressions.
- The loamy Tyden soils are in depressions.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- During dry conditions, the sandy surface layer limits prescribed burning because of droughtiness.
- The sandy surface texture severely limits the use for chemical site preparation because of moderately rapid permeability.

Minor limitations:
- The sandy surface texture limits the use of equipment during dry conditions.

Wildlife Habitat
Major limitations:
- During dry conditions, the sandy surface and subsoil limits the establishment, growth, and yield of plants used for food and cover because of droughtiness.

Minor limitations:
- The seasonal high water table limits the growth and yield of plants used for food and cover.

Urban Development
Major limitations:
- The sandy texture limits most urban uses.
- The seasonal high water table limits most urban uses.

Recreation

Major limitations:

- During dry conditions, the sandy surface and subsoil limits the establishment and growth of plants.

Minor limitations:

- The seasonal high water table limits picnic areas and paths and trails because of wetness.
- The seasonal high water table limits recreational use.

Interpretive Groups

Land capability classification: 3w
Woodland group: 7

W—Water

These areas are natural or constructed bodies of surface water.

WdA—Waller-Dallardsville complex, 0 to 1 percent slopes

Setting

Landscape: Flat Coastal Plain
Landform: Waller—flats; Dallardsville—pimple mound
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 500 acres

Typical Profile

Waller

Surface layer:
0 to 3 inches—dark grayish brown, very strongly acid very fine sandy loam

Subsurface layer:
3 to 30 inches—mottled, pinkish gray and gray, very strongly acid silt loam

Subsoil:
30 to 56 inches—mottled, gray and white, very strongly acid clay loam
56 to 65 inches—mottled, gray and light gray, very strongly acid clay loam
65 to 80 inches—mottled, gray, very strongly acid clay loam

Dallardsville

Surface layer:
0 to 7 inches—yellowish brown, extremely acid very fine sandy loam

Subsurface layer:
7 to 38 inches—mottled, pink and reddish yellow, extremely acid very fine sandy loam

Subsoil:
38 to 61 inches—mottled, light yellowish brown, brownish yellow, pink, and light gray, very strongly acid very fine sandy loam
61 to 75 inches—mottled, slightly brittle, brownish yellow and light gray, very strongly acid very fine sandy loam
75 to 80 inches—mottled, brittle reddish yellow, very strongly acid very fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Waller—poorly drained; Dallardsville—moderately well drained
Water table: Waller—a seasonal high water table exists from the surface to 3.5 feet below the surface during November to March; Dallardsville—a seasonal high water table exists from 3 to 5 feet during December to April.
Flooding: None
Runoff: Waller—Negligible; Dallardsville—Low
Permeability: Slow
Available water capacity: High
Root zone: Very deep
Salinity: Nonsaline
Shrink-swell potential: Low
Water erosion hazard: Slight

Composition

The Waller soil and similar soils: 50 to 55 percent
The Dallardsville soil and similar soils: 35 to 40 percent
Contrasting inclusions: 5 to 15 percent

Contrasting Inclusions

- The moderately well drained Kirbyville soils are on higher positions than those of Waller soils.
- The Nona soils have subsoils with less than 15 percent sands coarser than very fine sand and are on positions similar to those of Waller soils.
- The Sorter soils have a lower percentage of clay in the subsoil and are on positions similar to those of Waller soils.

Land Uses

Major land use: Woodland
Other land uses: Wildlife habitat, urban development, recreation

Management Concerns

Woodland
Major limitations:
- The seasonal high water table in the Waller soils limits woodland management.

Minor limitations:
- The mounded Dallardsville soils limits the use of equipment.

Wildlife Habitat
Major limitations:
- The seasonal high water table in the Waller soils limits the establishment and growth of plants used for food and cover.

Urban Development
Major limitations:
- The seasonal high water table in the Waller soils limits the use of the soils for most urban development.
- The seasonal high water table in the Dallardsville soils limits the use of the soils for septic tank absorption field.

Minor limitations:
- The seasonal high water table in the Dallardsville soils limits the use of the soil in excavating pits and trenches.

Recreation

Major limitations:

- The seasonal high water table in the Waller soil limits the use of the soil for recreational uses.

Minor limitations:

- The seasonal high water table in the Dallardsville soil limits the use of the soil for playgrounds, campgrounds, and picnic areas.

Interpretive Groups

Land capability classification: Waller soil—4w; Dallardsville soil—2w
Woodland group: Waller soil—12; Dallardsville soil—9

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

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

In 1995, beef cattle production was second to timber production for agricultural income in Hardin County. Many areas of cropland and forestland have been converted to pasture and hayland to support the beef cattle industry.

Pensacola bahiagrass and improved bermudagrass are the most widely grown pasture grasses. These grasses are adapted to the soils and climate of the area. Good pasture management practices include applying fertilizer, liming when necessary, maintaining proper grazing heights of plants, controlling weeds, and brush, rotational grazing, and maintaining adequate livestock water supplies. Applications of fertilizer and lime for all soils should be based on the results of soil tests, the needs of the crop, and on the expected level of yields. The local offices of the Texas Cooperative Extension and the Natural Resources Conservation Service can help to determine the kind, and amount of fertilizer, and lime to apply.

Hay is produced from improved bermudagrass, Pensacola bahiagrass, and forage sorghum. Soils with good natural drainage are best suited to pasture and hay production. These soils within the Western Gulf Coast Flatwoods MLRA suited to pasture and hay production include the Batson, Belrose, Kenefick, Kirbyville, Kountze, Otanya, and Silsbee series. Soils of the Gulf Coast Prairie MLRA suited to pasture and hay production include the Anahuac, Labelle, and League series. With proper drainage, the Beaumont and Aris series are capable of good pasture and hay production.

Cropland is of minor extent in Hardin County. In 1989, Hardin County had a total of 8,733 acres of cropland. By 1995, cropland acreage was less than 1,000 acres.

Rice (fig. 13) and soybeans are the dominant row crops and are grown if economic conditions are favorable. Soils suitable for crops are mostly confined to the Gulf Coast Prairie MLRA. Soils of the Western Gulf Coast Flatwoods MLRA are generally not suited to most crops because of wetness, low fertility, and soil acidity.

The main management concerns in areas of cropland are establishing drainage systems, maintaining tilth, and maintaining fertility. The hazard of erosion affects a few soils in the county. During the summer, moisture conservation is a management concern in years when rainfall is considerably below average.

In those areas suitable for cropland, surface runoff is very slow because the soils are nearly level, slowly permeable, or very slowly permeable. These soils remain wet for prolonged periods after rains. Farming operations such as preparing seedbeds, planting, and harvesting are difficult to accomplish because of the wetness. The prolonged wetness also delays germination, affects the growth of plants, and reduces productivity.

Properly installed drainage systems are needed to remove excess water from cropland. Many areas are not drained because adequate outlets are not available. Before a drainage system is installed, the availability of adequate outlets should be determined and the direction and arrangement of rows should be considered. Planning the system so that it does not hinder the operation of farm equipment is important.

Organic matter helps to maintain tilth and fertility. It increases the available water capacity, the rate of water infiltration, and improves aeration. It decreases the runoff rate and helps to control erosion. Organic matter also improves the conditions needed for seed germination. Good management of crop residue can maintain the content of organic matter.

Figure 13.—Rice in an area of League clay, 0 to 1 percent slopes.

Leaving crop residue on the surface helps to protect the soil against crusting and the impact of raindrops. A thick crust reduces the rate of water intake and interferes with the emergence of seedlings. Crop residue minimizes compaction caused by farm machinery.

In most areas, some form of conservation tillage is recommended. Conservation tillage reduces the number of trips over the field with farm equipment, leaves more crop residue on the surface than conventional tillage methods, and reduces tillage costs.

The hazard of water erosion impacts a few soils in the county. It is a management concern in these areas. The erosion removes the fertile upper part of the soil and results in sedimentation of ditches, bayous, creeks, and rivers. Sheet erosion by water, in areas of cropland, may not be apparent. Generally water erosion is underestimated. In nearly level areas, normal cropping sequences and tillage practices help to control erosion. In more sloping areas, intensive management reduces erosion. Because these areas are small and erosion-control practices are expensive, most landowners use these more sloping areas for pastureland and woodland, rather than cropland. Managing clayey soils, such as the League and Beaumont series, is difficult because they can only be tilled within a very narrow range in moisture content. Cultivation when the soils are too wet or too dry results in the formation of clods. Clods interfere with seedbed preparation. Plowing when the soils are too wet can also result in the formation of a plowpan. Plowpans are compacted layers that restrict penetration of roots and movement of air and water through the soil.

Although many of the soils in the county are wet for long periods, soil moisture needs to be conserved during years when summer rainfall is below normal. Moisture can be conserved through timely planting, appropriate tillage practices, and effective use of crop residue.

All of the soils in the county used for cultivated crops benefit from applications of commercial fertilizer. The kind and amount of fertilizer needed varies according to the type of soil, crop, expected level of yield, previous land use, and the season of the year. Additional applications of nitrogen fertilizer are needed if the amount of crop residue is abundant. Microorganisms decompose organic matter, convert it to humus, and use a large amount of nitrogen. The additional fertilizer ensures that enough nitrogen is available for both the microorganisms and the growing crop. Nitrogen used by these organisms is not lost but is released later in the season.

Most of the soils in Hardin County have a favorable reaction, or pH range, for commonly grown crops. Soils in areas where plants do well under alkaline conditions may benefit from the application of lime.

A rotational cropping system is a management practice used to improve soil tilth and protect the soil during heavy rains. It helps to control weeds, insects, and plant diseases. Crops that return small amounts of residue are grown in rotation with crops that return large amounts of residue. In Hardin County, rice is commonly grown in rotation with soybeans or pasture. The most common rotations are rice-soybeans, rice-pasture, and grain sorghum-soybeans. With good management, these cropping systems will produce goods yields indefinitely.

Many soils in the county are well suited to rice because they are nearly level and have a very slow permeable subsoil. Soils suited to rice production are the Aris, Beaumont, Labelle, and League series.

Management practices used in the production of rice differ from those used for other crops. Rice differs from other crops because rice is grown using controlled flooding. Soil aeration is important while the plants are young; therefore, fields are not flooded until the plants are about 6 inches tall. After plants have reached this height, the crop is continuously flooded until shortly before harvest. A good surface drainage system is needed for the early development of plants and during harvest.

When growing rice, landforming and constructing irrigation levees are common practices. Landforming smoothes the surface of the land by establishing a uniform grade so that a uniform water depth can be maintained between the levees. When properly designed and installed, landforming can make effective use of rainfall and improve surface drainage.

Because rice is continuously flooded from May until before harvest, aircraft are used to apply chemicals and fertilizer.

The specialty crops grown in the survey area are vegetables, blueberries, and nursery plants. Very deep soils that are characterized by good natural drainage are well suited to vegetable production. Those soils in the Gulf Coast Prairie MLRA suited to specialty crop production include the Anahuac and Spindletop series. With drainage, the Labelle and League soils can support these crops. The soils in the Western Gulf Coast Flatwoods MLRA suited to vegetables, blueberries, and nursery plants are the Batson, Belrose, Dallardsville, Gist, Kenefick, Kountze, Niwana, Otanya, and Silsbee series.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

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

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

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

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

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Texas Cooperative Extension can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

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, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

The acreage of soils in each capability class or subclass is shown in table 4. The capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Prime Farmland

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

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 303,600 acres in the survey area, or about 53 percent of the total acreage, meets the soil requirements for prime farmland and about 146,300 acres or about 25 percent of the total acreage, meets the requirement for prime farmland when drained.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in Table 6. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in Table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Woodland

Hardin County has about 468,043 acres of woodland, including areas of hardwoods on flood plains, and mixed pine and hardwoods on coastal plains. The woodland areas are used for producing commercial wood products, wildlife habitat, recreational activities, and represent a major source of income for Hardin County.

The largest areas of forestland are in the Western Gulf Coast Flatwoods MLRA. Although soils of the Gulf Coast Prairie MLRA are not forested, an encroachment of pine onto the prairie has occurred. Some of these soils are capable of commercial pine production.

Woodland managers can use this soil survey in planning the use of soils for wood products. Table 7 summarizes the forest and soil management relationships and rates the soils for a number of factors considered in management. Only those soils suitable for wood crops are listed and rated. A full explanation of these relationships is given below. For convenience, soils with similar production capabilities and limitations are grouped together in woodland groups.

Woodland Groups

Woodland Group 1. This group includes the Belrose, Gist, Kenefick, and Niwana series. These very deep loamy soils are on terraces and nearly level to gently sloping coastal plains (some occur as mounds). They have a very high potential for woodland management, both pine and hardwood. Common overstory trees include loblolly and occasionally shortleaf pine and longleaf pine; white oak, southern red oak, and water oak; sweetgum; white ash; and elm. Beech and sweetbay may also be found. The 50-year site index for loblolly pine averages 100 feet (70 feet on a 25-year curve), but ranges from 95 to 105 feet. The 50-year site index for longleaf pine averages 80 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 460 board feet (Doyle Rule) or 115 cubic feet per acre per year. Management can substantially increase this yield. The only problem associated with these soils is the somewhat limited access and equipment operability during wet periods when rutting can be a moderate concern. Short-term restrictions may be necessary at these times. These soils are well suited to roads and log landings and should have little erosion problems when adequate water control devices such as wing ditches and water bars are installed on the steeper slopes. They are well suited to most mechanical site preparation and tree planting methods.

Woodland Group 2. This group includes the Batson, Kirbyville, Kountze, and Spurger series. These very deep loamy soils occur on coastal plains and terraces and have very high potential for woodland management, both pine and hardwood. Common overstory trees include loblolly pine; water oak, white oak, willow oak, and cherrybark oak; green ash; blackgum; American elm and winged elm; and sweetgum. Magnolia and sweetbay may also be found. Shortleaf pine, longleaf pine, and red oak may be present on drier sites. The 50-year site index for loblolly pine ranges from 95 to 105 feet (approximately 62 to 72 feet on a 25-year curve). For bottomland oaks the site index averages 90 to 95 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 460 board feet (Doyle Rule) or 115 cubic feet per acre per year. Management can substantially increase this yield. Access and equipment operability on these soils is fair during wet periods. Harvesting and other operations may need to be suspended during such periods. Wetness will also cause some slight problems on these soils for log landings and roads. Raising and crowning the road surface may be necessary. Some problems with rutting may occur during wet periods. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the slow permeability of the Spurger soils. Applications should not be made during wet periods.

Woodland Group 3. This group includes the Iulus series. This very deep loamy soil occurs on flood plains and has a very high potential for woodland management, both pine and hardwood. Common overstory trees include loblolly pine; water oak, and cherrybark oak; green ash; American elm; sugarberry; and sweetgum. Shortleaf pine may occur on drier sites and willow oak may occur on wetter sites. The 50-year site index for loblolly pine ranges from 95 to 110 feet (approximately 62 to 75 feet on a 25-year curve). Oaks grown on flood plains have a site index average of 85 to 100 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 460 board feet (Doyle Rule) or 115 cubic feet per acre per year. Although management can substantially increase this yield, it should also include attention to streamside management zone considerations to protect water quality. Access and equipment operability on this soil is poor during wet periods because of flooding. Harvesting and other operations may need to be suspended during such periods. Flooding also makes this soil poorly suited to log landings and roads. Road construction should be limited. When this soil is wet, the low strength will lead to severe rutting problems and is poorly suited to road construction. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the possibility for flooding in order to prevent the contamination of surface waters. Wetness may cause a moderate loss in pine seedling survival.

Woodland Group 4. This group includes the Evadale series. This very deep loamy soil occurs on nearly level and depressional coastal plains. They have a very high potential for woodland management, both pine and hardwood. Common overstory trees include loblolly pine; water oak, laurel oak, and willow oak; green ash; blackgum; and sweetgum. The 50-year site index for loblolly pine averages 100 feet (approximately 70 feet on a 25-year curve) and ranges from 90 to 110 feet depending on drainage. The site index for bottomland hardwoods averages 90 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 460 board feet (Doyle Rule) or 115 cubic feet per acre per year. Management can substantially increase this yield. Access and equipment operability on this soil is poor during wet periods because of ponding and saturation of the soil. Harvesting and other operations may need to be suspended during such periods. Wetness also makes this soil poorly suited to log landings and roads. When this soil is wet, the low strength will lead to severe rutting problems and is poorly suited to road construction. Raising and crowning the roadbed will be necessary and care must be taken to avoid interrupting the natural drainage. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the poor drainage on this soil. Applications should not be made during wet periods. Wetness may cause a moderate loss in pine seedling survival. Bedding may be necessary.

Woodland Group 5. This group includes the Bleakwood and Manco series. These very deep loamy soils occur on flood plains and have a very high potential for woodland management, both pine and hardwood. Common overstory trees include water oak, willow oak, and laurel oak; green ash; American and cedar elm; sugarberry; blackgum; sweetgum; and scattered loblolly pine. Flooding greatly hinders pine production. The 50-year site index for loblolly pine ranges from 100 to 110 feet (approximately 70 to 75 feet on a 25-year curve). For bottomland oaks, the site index averages 95 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 460 board feet (Doyle Rule) or 115 cubic feet per acre per year. Although management can substantially increase this yield, it should also include attention to streamside management zone considerations to protect water quality. Access and equipment operability on these soils is poor during wet periods because of flooding. Flooding also makes these soils poorly suited to log landings and roads. Road construction should be limited. When these soils are wet, their low strength will lead to severe rutting problems. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the possibility of flooding in order to prevent the contamination of surface waters. Wetness may cause a moderate loss in pine seedling survival.

Woodland Group 6. This group includes the Otanya and Silsbee series. These very deep loamy soils are on very gently sloping to steeply sloping coastal plains and have a high potential for woodland management, both pine and hardwood. Common overstory trees include loblolly pine and occasionally shortleaf pine; white oak, southern red oak, and water oak; sweetgum; white ash; and winged elm. The 50-year site index for loblolly pine averages 90 feet (60 feet on a 25-year curve), but ranges from 85 to 100 feet. The 50-year site index for longleaf pine averages 80 feet. The yield from an unmanaged, natural stand of loblolly pine, over 50-year period, is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield. The only problem associated with these soils is the somewhat limited access and equipment operability during wet periods when rutting can be a moderate concern. Short-term restrictions may be necessary at these times. These soils are well suited to most mechanical site preparation and tree planting methods.

Woodland Group 7. This group includes the Votaw series. This very deep sandy soil is on terraces and has a high potential for pine management. Common overstory trees include loblolly pine, occasionally longleaf pine, and shortleaf pine; southern red oak and water oak; white ash; sweetgum and hickory. The 50-year site index for loblolly pine averages 90 feet (approximately 60 feet on a 25-year curve), but ranges from 85 feet to 95 feet depending on slope position. The yield from a natural, unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre year. Management can substantially increase this yield. This soil is loose when dry; therefore, access and equipment operability is poor during such periods when rutting is possible. It is however, well suited to access and equipment operability during wet periods. This soil is well suited to roads and log landings but can have erosion problems as slopes increase. Adequate water control devices for roads such as wing ditches and water bars should be installed. Seedling mortality may be slight to moderate.

Proper planting depth and compaction will be important. Herbaceous weed control may be needed. Leaching of fertilizers and of chemicals may occur when herbicides are used for site preparation. Choose appropriate chemicals and application methods to reduce the possibility of contaminating ground water.

Woodland Group 8. This group includes the Estes series. This very deep clayey soil occurs on flood plains and has a high potential for hardwood management. Common overstory trees include water oak and willow oak; green ash; sugarberry; and sweetgum. A few scattered loblolly pine may be found on drier sites. Overcup oak may be present on wetter sites. The 50-year site index for sweetgum and oaks on the flood plain averages 90 feet and ranges from 80 to 100 feet, depending on drainage. The yield from an unmanaged, natural stand of sweetgum, over a 50-year period, is approximately 210 board feet (Doyle Rule) per acre per year. Although management can substantially increase this yield, it should also include attention to streamside management zone considerations to protect water quality. Access and equipment operability on this soil is poor for long periods because of flooding and wetness. Harvesting and other operations may need to be suspended during these periods. Rutting during these operations can be severe because of low strength of these soils. Flooding causes this soil to be poorly suited to log landings and roads. Road construction should be limited. Planting will be made difficult because of wetness and the sticky nature of these soils. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the possibility for flooding to prevent the possible contamination of surface waters.

Woodland Group 9. This group includes the Dallardsville and Texla series. These very deep loamy soils occur as mounds on coastal plains. They have a high potential for both pine and hardwood management. Common overstory trees include loblolly pine and occasionally longleaf pine; water oak, post oak, and southern red oak; ash; blackgum; and sweetgum. The 50-year site index for loblolly pine ranges from 85 to 95 feet or approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. The 50-year site index for longleaf pine averages between 80 and 85 feet. Management can substantially increase this yield. Access and equipment operability on these soils is poor during wet periods. Harvesting and other operations may need to be suspended during such periods when rutting can be severe. Wetness and low strength will also cause moderate problems on these soils for log landings and roads. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the slow permeability and seasonal high water table on these soils. Applications should not be made during wet periods.

Woodland Group 10. This group includes the Vamont series. This very deep clayey soil occurs on coastal plains and has a high potential for both pine and hardwood management. Common overstory trees include loblolly pine; water, white, and cherrybark oak; green ash; blackgum; and sweetgum. Shortleaf pine, red oak, and post oak may occur on drier sites. The 50-year site index for loblolly pine averages 90 feet, but ranges from 85 to 95 feet (approximately 57 to 64 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield. Access and equipment operability on this soil is poor during wet periods. Harvesting and other operations may need to be suspended during such periods when rutting can be severe. Wetness and low strength will also cause moderate problems on this soil for log landings and roads. Site preparation during wet periods and tree planting operations will have moderate problems because of the sticky nature of this soil.

Woodland Group 11. This group includes the Anahuac, Labelle, and League series. Although this occurs as a prairie soil, trees have encroached or have been planted in some areas. However, because the soil reaction, clay content, and soil moisture characteristics are variable, reliable predictions cannot be made on tree planting success, production, or management potential. Common overstory trees include loblolly pine; water oak, laurel oak, and willow oak; green ash; American elm; and sweetgum. On sites growing pine, the 50-year site index for loblolly pine ranges from 90 to 95 feet (approximately 60 to 62 feet on a 25-year curve). For bottomland oaks the site index averages 75 to 80 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield. Access and equipment operability on these soils is poor during wet periods. Harvesting and other operations may need to be suspended during such periods, when rutting will occur. Wetness and low strength will also cause problems on these soils for log landings and roads. Raising and crowning the road surface will be necessary. Wetness may cause some mortality to pine seedlings. When planning the use of herbicides for site preparation, consider the slow permeability on these soils. Applications should not be made during wet periods.

Woodland Group 12. This group includes the Bevil, Olive, and Waller series. These very deep clayey and loamy soils occur on level to depressional coastal plains. They have a high potential for woodland management, both pine and hardwood. Common overstory trees include loblolly pine; water oak, willow oak, and cherrybark oak; green ash; winged elm; blackgum; and sweetgum. Magnolia, sweetbay, and swamp chestnut may also be present to a lesser extent. The 50-year site index for loblolly pine averages 90 feet (approximately 60 feet on a 25-year curve) but ranges from 85 to 95 feet. Oaks on flood plains have a site index that ranges from 75 to 85 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield. Access and equipment operability on these soils is poor during wet periods because of saturation of the soil. Harvesting and other operations may need to be suspended during such periods. Wetness also makes these soils poorly suited to log landings and roads. Wetness and low strength will lead to severe rutting problems and make them moderately suited to road construction. Raising and crowning the roadbed will be necessary and care must be taken to avoid interrupting the natural drainage. Stickiness and wetness will cause problems for site preparation and planting operations. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the poor drainage on these soils. Applications should not be made during wet periods. Wetness may cause a moderate loss in pine seedling survival. Bedding may be needed.

Woodland Group 13. This group includes the Aris, Beaumont, and Leton series. Although these occur as prairie soils, trees have encroached or have been planted in some areas. However, because their soil reaction, clay content, and soil moisture characteristics are available, reliable predictions cannot be made on tree planting success, production, or management potential. They occur as nearly level to depressional soils and common overstory trees include loblolly pine; water oak and willow oak; green ash; hickory; and sweetgum. Cherrybark oak and swamp chestnut oak may be found on drier sites. On sites growing pine, the 50-year site index for loblolly pine averages 90 feet (approximately 60 feet on a 25-year curve), but ranges from 85 to 95 feet. For bottomland oaks the site index averages 75 to 80 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield. Access and equipment operability on these soils is poor during wet periods. Harvesting and other operations may need to be suspended during such periods. Wetness and low strength will also cause problems for log landings and roads. Low strength and wetness makes them moderately suited to road construction material and rutting will occur during wet periods. Raising and crowning the road surface may be necessary, but natural drainage must not be interrupted. Stickiness and wetness will cause problems for site preparation and planting operations. These practices should be planned for the drier part of the year and planting season. The slow permeability will cause moderate pine seedling mortality. Bedding may be necessary. When planning the use of herbicides for site preparation, consider the slow permeability and seasonal high water table in these soils. Applications should be avoided during wet periods.

Woodland Group 14. This group includes the McNeely and Turkey series (fig. 14). These very deep sandy soils are on stream terraces and have a moderate potential for pine management. Common overstory trees include loblolly pine, shortleaf pine, and longleaf pine; southern red oak, post oak, and white oak; sweetgum and hickory. Beech and magnolia may also be found. The 50-year site index for loblolly pine averages 85 feet (57 feet on a 25-year curve) but ranges from 80 feet to 95 feet, depending on slope position. The yield from a natural, unmanaged stand of loblolly pine, over a 50-year period, is approximately 280 board feet (Doyle Rule) or 80 cubic feet per acre per year. Management can substantially increase this yield. Because these soils are loose when dry, access and equipment operability is poor during such periods when rutting is possible. They are well suited to roads and log landings but can have erosion problems as slopes increase. Adequate water control devices for roads, such as wing ditches and water bars, should be installed on the steeper slopes. Seedling mortality may be slight to moderate. Proper planting depth and compaction will be important. Herbaceous weed control may be needed. Leaching of fertilizers and of chemicals may occur when herbicides are used for site preparation. Choose appropriate chemicals and application methods to prevent the possible contamination of ground water.

Woodland Group 15. This group includes the Babco series. This very deep sandy soil occurs on terraces and has a moderate potential for both pine and hardwood management. Common overstory trees include loblolly pine and longleaf pine; water oak and white oak; green ash; and sweetgum. Magnolia and sweetbay may also be found.

Figure 14.—A three-year old pine plantation in an area of Turkey sand, 1 to 3 percent slopes.

The 50-year site index for loblolly pine averages 80 feet (approximately 55 feet on a 25-year curve) but ranges from 70 to 85 feet. For oaks on flood plains, the site index averages 70 to 75 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 280 board feet (Doyle Rule) or 80 cubic feet per acre per year. Management can substantially increase this yield. Access and equipment operability on this soil is poor during wet periods. Harvesting and other operations may need to be suspended during such periods when rutting can be severe. Wetness and low strength will also cause moderate to severe problems on this soil for log landings and roads. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the slow permeability and seasonal high water table on these soils. Applications should be avoided during wet periods. Wetness may also cause moderate mortality to pine seedlings.

Woodland Group 16. This group includes the Camptown, Jayhawker, Sorter, and Tyden series. These very deep loamy soils occur as nearly level to depressional coastal plains. Ponding of water is common during wet months. They have a moderate potential for woodland management, both pine and hardwood. Common overstory trees include loblolly pine; willow oak; green ash; blackgum, red maple, sweetbay, and sweetgum. Magnolia and cypress may also be found. The 50-year site index for loblolly pine averages between 80 and 85 feet (approximately 55 to 57 feet on a 25-year curve), but can range from 75 to 95 feet depending on drainage. The 50-year site index for bottomland oaks ranges from 70 to 80 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 250 board feet (Doyle Rule) or 80 cubic feet per acre per year. Management can substantially increase this yield. Ponding and wetness hinders management on these soils. Access and equipment operability on these soils is poor during wet periods, when rutting will occur because of saturation of the soil. Harvesting and other operations may need to be suspended during such periods. Wetness also makes these soils poorly suited to log landings and roads. Low strength makes them moderately to poorly suited to road construction. Raising and crowning the roadbed will be necessary and care must be taken to avoid interrupting the natural drainage. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the poor drainage and seasonal high water table on these soils. Wetness may cause a moderate loss in seedling survival. Bedding may be needed. Slash pine may be suited to these soils.

Woodland Group 17. This group includes the Nona and Plank series. These very deep loamy soils occur as nearly level to depressional coastal plains. They have a moderate potential for woodland management, both pine and hardwood. Common overstory trees include loblolly pine; water oak, laurel oak, and willow oak; green ash; blackgum, red maple, sweetbay, and sweetgum. Longleaf pine may also be found on the Nona soils. Cherrybark oak may be found on drier sites. The 50-year site index for loblolly pine averages between 75 and 80 feet (approximately 55 feet on a 25-year curve) but ranges from 70 to 85 feet. The site index for flood plain oaks ranges from 65 to 75 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 230 board feet (Doyle Rule) or 75 cubic feet per acre per year. Management can substantially increase this yield. Access and equipment operability on these soils is poor during wet periods because of saturation of the soil. Harvesting and other operations may need to be suspended during such periods, when rutting will occur. Wetness also makes these soils poorly suited to log landings and roads. Low strength makes them moderately suited to road construction material. Road layout should avoid these soils whenever possible. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the poor drainage on these soils. Applications should not be made during wet periods. Wetness may cause a moderate loss in pine seedling survival. Slash pine may be suited to these soils.

Woodland Group 18. This group includes the Angelina and Caneyhead series. These very deep loamy soils are on flood plains or occur on depressional areas along poorly defined drainageways on terraces. They have a low potential for hardwood management. Common overstory trees include scattered green ash; tupelo; red maple; and overcup oak. The 50-year site indexes for overcup oak averages 65 to 70 feet. Although management can substantially improve yields, management opportunities will be severely restricted because of flooding and the presence of a year-round seasonal high water table. Wetness and flooding makes these soils poorly suited to roads and log landings. Few high value species are suited to these soils. Seedling mortality will be severe.

Woodland Group 19. This group includes the Jasco series. This loamy soil occurs on depressional coastal plains and has a low potential for woodland management, both pine and hardwood. Common overstory trees include loblolly pine; willow oak and laurel oak; green ash; blackgum; and sweetgum. The 50-year site index for loblolly pine averages between 70 and 75 feet (approximately 50 to 53 feet on a 25-year curve). The site index for bottomland oaks averages approximately 60 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 130 board feet (Doyle Rule) or 50 cubic feet per acre per year. Although management can substantially increase this yield, ponding and the wet nature of this soil will impact management practices. Access and equipment operability on this soil is poor for much of the year because of a seasonal high water table. Harvesting and other operations may need to be suspended during such periods, when rutting will occur. Wetness also makes this soil poorly suited to log landings and roads. The soil's low strength makes it moderately suited to road construction material. Raising and crowning the road surface will be necessary. Site preparation operations should be limited to the dry months and planting should be planned for the drier part of the planting season. When planning the use of herbicides for site preparation, consider the poor drainage and seasonal high water table on this soil. Applications should not be made during wet periods. Wetness may cause a moderate loss in pine seedling survival. Bedding may be needed. Slash pine may be suited to this soil.

Woodland Group 20. This group includes the Cypress and Lelavale series. These clayey and loamy soils occur as depressional areas on terraces and coastal plains, and are ponded for much of the year. Under normal conditions, this soil does not grow commercial stands of timber that are feasible to manage. Common overstory trees include red maple, tupelo, cypress, and, occasionally, willow oak. The extreme moisture conditions make growth slow and erratic and thus undependable. Access and operability are poor and road construction should be avoided whenever possible.

Forest Management and Productivity

The tables in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forest management.

Forest Management

In Table 8, *slight, moderate*, and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may limit stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

Forest Productivity

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The *site index* is the average height, in feet, that dominant and co-dominant trees of a given species attain in a specified number of years (50 years). The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. The productivity of the soils in this survey generally is based on loblolly pine for all sites suited to pine.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Suggested trees to plant are those that are suitable for commercial wood production. The first species listed under S*uggested trees to plant* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Woodland Understory Vegetation

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

The density of the canopy determines the amount of light that reaches the understory plants. Canopy cover is a major factor affecting the production of vegetation that is within reach of livestock and large game animals. Livestock management and good silvicultural practices such as thinning of timber stands, removal of cull trees, and controlled burning are necessary to maintain moderate to good production of understory vegetation. Without the proper management practices, the canopy cover increases drastically because of the growth of shrubs and hardwoods in the midstory. A site that has a closed canopy of 75 percent or more may not have sufficient carrying capacity for a profitable livestock operation. Use of the area by large game animals will be limited because sufficient browse plants are not available.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter.

In addition to proper woodland management, the following practices can help achieve high levels of forage production.

Proper woodland grazing is grazing at an intensity that maintains or improves the quantity and quality of desirable plants. It is generally thought to be grazing of no more than half, by weight, of the annual growth of key forage plants in preferred grazing areas. Proper grazing increases the vigor and reproductive capacity of key forage plants, conserves soil and water, improves the condition of the vegetation, increases forage production, maintains natural beauty, and reduces the hazard of wildfire.

Deferred grazing consists of postponing grazing or resting the grazing land for a prescribed period. The rest period promotes the growth of natural vegetation by permitting the vigor of the forage to increase and by allowing desirable plants to seed. Deferred grazing provides feed reserves for fall and winter, improves the appearance of land by having more vegetative cover, and reduces the hazard of erosion.

Planned grazing systems are systems in which two or more grazing units are rested in a planned sequence throughout the year or during the growing season of key forage plants. These systems improve the production of desirable forage plants and trees.

Prescribed burning is the use of fire under controlled conditions. It can be used to control undesirable vegetation, increase production by removal of part of the organic layer, reduce the hazard of wildfire, and remove old, unpalatable forage plants.

Recreation

Ricky E. Lambert, Soil Scientist, Natural Resources Conservation Service, helped prepare this section.

Hardin County has access to many natural areas ideally suited to a variety of recreational activities. The United States Department of Interior's Big Thicket Natural Preserve and the Texas Parks and Wildlife's Village Creek State Park are situated within the county. These parks offer visitors a myriad of activities throughout the year. The Big Thicket Natural Preserve is a unique natural area that contains dense impenetrable forest, bottomland hardwoods, and sand hills that support cacti and yucca.

Situated along Village Creek between Silsbee and Kountze is the Roy E. Larsen Sandyland Sanctuary, which is owned and operated by the Nature Conservancy. The sanctuary is intensively managed to provide visitors a glimpse of Hardin County as it looked prior to settlement.

With Hardin County's abundant forested areas and adequate sources of water, it is an excellent area of wildlife habitat. Private and public lands offer hunting for deer, squirrels, and other game.

Hardin County is within a 2-hour drive of some of Texas' largest lakes. Lake Sam Rayburn, Toledo Bend, Lake Livingston, and B.A. Steinhagen Lake offer year-round fishing, boating, and swimming. In addition, these lakes have many campgrounds, resorts, and marinas that service the lake area.

The county is about 50 miles from the Texas Gulf Coast. Sabine Lake and the coastal area nearby are well known for excellent sport fishing and their abundance of wildlife.

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

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

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

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

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

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

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use.

They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Bill Deauman, Wildlife Biologist, Natural Resources Conservation Service, helped prepare this section.

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

Hardin County is home to some of the unique ecological areas in the United States. Wildlife habitat in Hardin County includes areas of mixed pine and hardwoods, areas of cropland and pastureland, and areas along the flood plains of the county's major waterways. Each area supports a variety of plants and wildlife and diversity occurs most in areas where different habitat types merge.

The soils of the flatwoods support areas of loblolly pine plantations to areas of mixed forests of hardwoods and pines. Understory vegetation includes yaupon, American beautyberry, greenbriar, rattan, and longleaf uniola. The flatwoods have numerous intermittent and perennial streams and small depressions that hold water in most years. The major game species include white-tailed deer, squirrels, and feral hogs. Armadillos, coyotes, fox, opossums, rabbits, and raccoons are of lesser extent. The mixed forests provide a resting and feeding place for migratory songbirds.

The soils of the coast prairie are primarily used as pasture with some areas as cropland. The dominant acreage of pasture is planted to perennial forage grasses, while the cropland is rice or soybeans. The presence of water on the coast prairie is mostly confined to man-made ponds and canals or creeks in the adjacent woods. The major game species include white-tailed deer, ducks, geese, and feral hogs.

The soils of the flood plains support a variety of oaks, blackgum, ash, and cypress. Understory plants include hornbeam, hawthorn, arrowwood, yaupon, dwarf palmetto, switchcane, and savannah panicum. Oxbow lakes, buttonbush swamps, and cypress swamps are mostly along the Neches River and, to a lesser extent, the major creeks and bayous. These areas are periodically flooded for just a few hours to several weeks at a time. The wildlife found on the flood plains is similar to that found in the flatwoods. Wetland areas support a variety of nongame species, such as water snakes, frogs, turtles, fish, herons, and egrets. The American alligator may inhabit some wetland areas.

Hardin County has many small damless (or pit-type) ponds and many of the soils are suited to their construction. These ponds and lakes are stocked and managed for largemouth bass, channel and blue catfish, crappie, and bluegill. Species found in streams and rivers include freshwater drum, flathead catfish, bull head catfish, carp, gar, bowfin, buffalofish, white bass, gizzard shad, various sunfish species, and crappie. Although aquaculture is on a small scale in Hardin County, the conditions for catfish and crawfish production are excellent.

Sound management practices are important in maintaining or improving the potential for various kinds of wildlife. Proper livestock grazing management prescribes burning to improve the quality of browse plants. Planting and maintaining woody and herbaceous species can improve the habitat for deer. Maintaining small areas of hardwoods in pine forests improves the habitat for deer and squirrels. The many rice fields found in the area are important overwintering areas for ducks and geese and the maintenance of these areas are vital for these species.

In Table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

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

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are rice and soybeans.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are bluestem, panicum, paspalum, and clover.

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

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

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

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

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

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

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

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

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

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

Hydric Soils

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology. (4) (14) (8) (13) Criteria for each of the characteristics must be met for areas to be identified as wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (5). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (6). The criteria are used to identify a phase of a soil series that normally is also a hydric soil. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (11) and "Keys to Soil Taxonomy" (10) and in the "Soil Survey Manual" (9).

If soils are wet enough for a long enough period to be considered hydric, they generally exhibit certain properties that can be observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (7).

For information regarding hydric soils in the soil survey area, refer to the USDA Natural Resources Conservation Service Soil Data Mart at http://soildatamart.nrcs.usda.gov.

Engineering

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

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because *of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.*

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

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

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

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

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

Building Site Development

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

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

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

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

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

Sanitary Facilities

Table 11 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *Trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soils have in a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an a*rea sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

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

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

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

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

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

25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

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

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

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

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

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

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

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

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

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

Water Management

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

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

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. The underlying material is not rated and should be evaluated during an onsite investigation. Excessive slope can affect the storage capacity of the reservoir area.

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

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

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

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

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

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

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

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

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

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

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 14 provides the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

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

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

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

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

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

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

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

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

Physical Soil Properties

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

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In Table 15, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In Table 15, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In Table 15, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

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

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

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

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in Table 15 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

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

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Soil Properties

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

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

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

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Water Features

Table 17 shows estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Piezometers (fig. 15) are used to measure the water table levels at various depths throughout the years. Table 17 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 17 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Figure 15.—A piezometer site in an area of Plank silt loam, 0 to 1 percent slopes. Piezometers are used to measure the water table depths.

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

Duration and *frequency* are estimated. Duration is expressed as extremely brief if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); occasional that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 18 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

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

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

Physical and Chemical Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in Table 20 and the results of chemical analysis in Table 19. The data are for soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by National Soil Survey Laboratory, U.S. Department of Agriculture, Natural Resources Conservation Service and the Soil Characterization Laboratory, Soil and Crop Sciences Department, Texas Agricultural Experiment Station.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (15).

Sand—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).
Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).
Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1).
Linear extensibility—change in clod dimension based on whole soil (4D).
Bulk density—of less than 2 mm material, saran-coated clods field moist (4A1a), 1/3-bar (4A1d), ovendry (4A1h).
Water retained—pressure extraction, natural clods, (0.06, 0.1, 1/3- or 1-bar); (4B1c).
Organic carbon—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c).
Reaction (pH)—1:1 water dilution (4C1a2a1).
Extractable cations—ammonium acetate pH 7.0, ICP; calcium (6N2e, 6N2f), magnesium (6O2d, 6O2e), sodium (6P2b, 6P2c), potassium (6Q2b, 6Q2c).
Aluminum—potassium chloride extraction (6G9c).
Total acidity—barium chloride-triethanolamine IV (6H5a).
Effective cation-exchange capacity—sum of extractable cations plus aluminum (5A3b).
Base saturation—ammonium acetate, pH 7.0 (5C1).
Exchangeable sodium percentage (ESP)—ammonium acetate, pH 7.0 (5D2).
Aluminum saturation—Bases plus Aluminum (5G1).
Ratios and estimates—Total clay (8D1).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (9, 10). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

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

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

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

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

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

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (9). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (11) and in "Keys to Soil Taxonomy" (10). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Anahuac Series

The Anahuac series consists of very deep, moderately well drained, very slowly permeable soils. These nearly level soils formed in loamy and clayey alluvial sediments on coastal plains of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Anahuac series are fine, mixed, active, hyperthermic Oxyaquic Glossudalfs.

Typical pedon of Anahuac very fine sandy loam in an area of Anahuac-Aris complex, 0 to 1 percent slopes; from the intersection of Texas Highway 105 and Farm Road 770 in Batson; 1.2 miles south on Farm Road 770 to Grimes Road; 0.5 mile southwest on Grimes Road to pasture road; 0.5 mile west on pasture road; 50 feet south on meander ridge in pasture; USGS Thorson Gully topographic quadrangle; lat. 30 degrees 13 minutes 28 seconds N. and lat. 94 degrees 37 minutes 16 seconds W.

A1—0 to 8 inches; very dark grayish brown (10YR 3/2) very fine sandy loam; weak fine and medium granular structure; soft, friable; many very fine and fine roots; common fine tubular pores; very strongly acid; clear smooth boundary.

A2—8 to 19 inches; brown (10YR 4/3) very fine sandy loam; weak fine granular structure; soft, friable; many very fine and fine roots; common fine tubular pores; 1 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with sharp boundaries along roots and pores; very strongly acid; clear smooth boundary.

E—19 to 24 inches; pale brown (10YR 6/3) very fine sandy loam; weak medium prismatic structure parting to weak fine and medium subangular blocky; soft, friable; common very fine roots; common fine tubular pores; 3 percent fine and medium distinct brownish yellow (10YR 6/6) iron concentrations with sharp boundaries along roots and pores; very strongly acid; abrupt smooth boundary.

E/Bt—24 to 32 inches; pale brown (10YR 6/3) (E) loam; 20 percent grayish brown (10YR 5/2) (Bt); weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; common very fine roots; common fine tubular pores; 3 percent fine and medium distinct brownish yellow (10YR 6/6) iron concentrations with clear boundaries along roots and pores; very strongly acid; abrupt smooth boundary.

Btg1—32 to 49 inches; grayish brown (10YR 5/2) clay; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; extremely hard, extremely firm; common very fine and fine roots; common very fine tubular pores; very few faint gray (10YR 5/1) clay films on surfaces of peds; 12 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 5 percent fine prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries on surfaces of peds; 8 percent fine and medium faint light gray (10YR 7/1) iron depletions with clear boundaries along surfaces of prisms; 5 percent streaks and pockets of pale brown (10YR 6/3) (E) loam; strongly acid; gradual smooth boundary.

Btg2—49 to 72 inches; light brownish gray (2.5Y 6/2) clay; moderate medium prismatic structure parting to weak fine and medium angular blocky; extremely hard, extremely firm; common very fine roots; common fine interstitial pores; very few faint gray (10YR 5/1) clay films; few distinct pressure faces; 15 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 8 percent fine prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; moderately acid; gradual wavy boundary.

Btg3—72 to 80 inches; light brownish gray (2.5Y 6/2) clay loam; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; few distinct gray (10YR 5/1) clay films; very few distinct pressure faces; 20 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 8 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; moderately acid.

Solum thickness is more than 80 inches. Combined thickness of the A and E horizons is 22 to 36 inches. Average clay content of the particle-size control section is 38 to 50 percent. Base saturation is less than 50 percent in some subhorizons below the mollic epipedon and typically ranges from 35 to 45 percent. These soils are saturated at a depth of 24 to 32 inches from December to March in most years.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Areas with value of 3 and chroma of 2 or 3 are less than 10 inches thick and have base saturation lower than 50 percent. Texture is very fine sandy loam or silt loam. Iron concentrations in the A2 are in shades of yellow or brown and range from 1 to 3 percent. Reaction is very strongly acid or strongly acid.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. Texture is very fine sandy loam or silt loam. Iron concentrations in shades of yellow or brown range from 2 to 8 percent. Reaction is very strongly acid or strongly acid.

The E part of the E/Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The Bt part has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. Texture is very fine sandy loam, loam, or silt loam. Iron concentrations in shades of yellow and brown range from 2 to 20 percent. Reaction is very strongly acid or strongly acid.

The Btg horizon has hue 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is clay in the upper part and ranges to clay loam in the lower part. Iron concentrations in shades of red, yellow, or brown range from 5 to 30 percent. Some pedons have few fine hard-pitted concretions of calcium carbonate at depths greater than 55 inches. Reaction ranges from strongly acid to slightly acid. Some pedons have Btg/E horizons at depths below 50 inches with similar colors and textures as the Btg.

Angelina Series

The Angelina series consists of very deep, very poorly drained, slowly permeable soils that formed in acid stratified loamy sediments. These soils are on flood plains and are ponded for long periods of time. Slopes are 0 to 1 percent. Soils of the Angelina series are fine-loamy, siliceous, active, acid thermic Typic Fluvaquents.

Typical pedon of Angelina fine sandy loam in an area of Estes-Angelina complex, 0 to 1 percent slopes, frequently flooded; from the intersection of Farm Road 92 and Farm Road 2937, 7.6 miles north on Farm Road 2937, 0.85 mile east on county road, 4.3 miles east on park road; 40 feet north of road in slough; USGS Franklin Lake topographic quadrangle; lat. 30 degrees 29 minutes 48.6 seconds N. and lat. 94 degrees 05 minutes 59.5 seconds W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; massive; soft, friable; many fine to coarse roots; many very fine and fine interstitial pores; 8 percent fine and medium prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries along roots and pores; extremely acid; abrupt smooth boundary.

Cg1—5 to 14 inches; light gray (10YR 7/1) loam; massive; loose, very friable; many fine and medium roots; common very fine and fine interstitial pores; 1 percent fine prominent light reddish brown (2.5YR 6/3) iron concentrations with clear boundaries; 5 percent fine and medium prominent yellow (10YR 7/8) iron concentrations with clear boundaries; 5 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 3 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; very strongly acid; clear smooth boundary.

Cg2—14 to 29 inches; bluish gray (5B 5/1) sandy clay loam; massive; hard, firm; common fine and medium roots; common very fine and fine interstitial and tubular pores; 4 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries between peds; 20 percent fine and medium prominent olive (5Y 5/6) iron concentrations with clear boundaries; 3 percent fine faint greenish gray (5BG 6/1) iron depletions with diffuse boundaries along roots; very strongly acid; clear smooth boundary.

Cg3—29 to 46 inches; greenish gray (5BG 6/1) clay loam; massive; hard, firm; common fine and medium roots; common very fine and fine interstitial and tubular pores; few strata 1 to 1 1/2 inches thick of medium sand; 3 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries on surfaces of peds; 5 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries on surfaces of peds; 3 percent medium faint grayish green (5G 5/2) iron depletions with diffuse boundaries along roots; very strongly acid; clear smooth boundary.

Cg4—46 to 67 inches; 60 percent gray (10YR 6/1) and 30 percent brownish yellow (10YR 6/6) clay loam; massive; hard, firm; few fine roots; common very fine and fine interstitial and tubular pores; 3 percent fine irregular reddish brown (2.5YR 4/4) iron-manganese concentrations with clear boundaries; 3 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries; 2 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; 1 percent fine and medium prominent greenish gray (10G 6/1) iron depletions with diffuse boundaries along roots; very strongly acid; clear smooth boundary.

Cg5—67 to 80 inches; greenish gray (10BG 6/1) clay loam; massive; hard, firm; common fine roots; common very fine and fine interstitial and tubular pores; few strata 1 to 1 1/2 inches wide of medium sand; 1 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries; extremely acid; clear smooth boundary.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 25 to 35 percent. These soils remain ponded from September to July in most years.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Texture is fine sandy loam or loam. Iron concentrations in shades of yellow and brown range from 3 to 15 percent. Reaction is extremely acid or very strongly acid. Most pedons have 1 to 4 inches of partially decomposed organic material on the surface.

The Cg horizon has hue of 10YR to 10BG, value of 5 to 7, and chroma of 0 to 2. Texture is sandy clay loam, loam, or clay loam. Horizons have thin strata of sand, fine sandy loam, loam, or silt loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Iron depletions in shades of gray, blue, or green range from 1 to 5 percent. Reaction is extremely acid or very strongly acid.

Aris Series

The Aris series consists of very deep, poorly drained, very slowly permeable soils. These nearly level soils formed in loamy and clayey sediments of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Aris series are fine, smectitic, hyperthermic, Typic Glossaqualfs

Typical pedon of Aris silt loam in an area of Aris-Levac complex, 0 to 1 percent slopes; from the intersection of Texas Highway 105 and Texas Highway 326; 5.4 miles west on Texas Highway 105 to county road; 0.9 mile south on county road to field road; 0.3 mile west and 0.2 mile north, then 0.5 mile west on field road; 300 feet north in pasture; USGS Thorson Gully topographic quadrangle; lat. 30 degrees 09 minutes 15.0 seconds N. and lat. 94 degrees 30 minutes 18.8 seconds W.

Ap—0 to 6 inches; grayish brown (10YR 5/2) silt loam; moderate fine and medium granular structure; slightly hard, friable; many fine and medium roots; common fine interstitial pores; 3 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries along roots and pores; 15 percent fine and medium faint light brownish gray (10YR 6/2) iron depletions with diffuse boundaries; very strongly acid; clear smooth boundary.

Eg—6 to 15 inches; light brownish gray (10YR 6/2) silt loam; moderate medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; common very fine and fine roots; common fine interstitial pores; 5 percent crawfish krotovinas; few distinct grayish brown (10YR 5/2) organic stains on surfaces of peds; 5 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with diffuse boundaries along roots and pores; 3 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with diffuse boundaries on surfaces of peds; very strongly acid; gradual smooth boundary.

Eg/Btg—15 to 24 inches; 60 percent light brownish gray (10YR 6/2) (Eg) silty clay loam; 30 percent gray (10YR 5/1) (Btg); moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; common very fine and fine roots; common fine tubular pores; 5 percent crawfish krotovinas; very few distinct dark gray (10YR 4/1) clay films on surfaces of peds and in pores; 5 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with diffuse boundaries; 3 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries along roots and pores; very strongly acid; gradual smooth boundary.

Btg/Eg1—24 to 43 inches; 65 percent gray (10YR 5/1) (Btg) clay loam; 20 percent light brownish gray (10YR 6/2) (Eg); moderate medium prismatic structure parting to weak medium subangular blocky; very hard, very firm; common very fine roots; common fine tubular pores; 5 percent crawfish krotovinas; very few distinct gray (10YR 5/1) clay films on surfaces of peds and in pores; 8 percent fine and medium prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries; 5 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries; very strongly acid; gradual wavy boundary.

Btg/Eg2—43 to 61 inches; 65 percent gray (10YR 6/1) (Btg) clay loam; 25 percent light gray (10YR 7/1) (Eg); weak coarse prismatic structure; very hard, very firm; common very fine roots; common very fine tubular pores; 5 percent crawfish krotovinas; very few prominent gray (10YR 5/1) clay films on surfaces of peds and in pores; 1 percent fine rounded yellowish brown (10YR 5/8) iron-manganese concretions; 6 percent fine and medium prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries; 4 percent fine prominent red (2.5YR 4/8) iron concentrations with sharp boundaries on surfaces of peds; very strongly acid; gradual wavy boundary.

Btg/Eg3—61 to 80 inches; 50 percent gray (10YR 6/1) (Btg) clay loam; 30 percent light gray (10YR 7/1) (Eg); weak coarse prismatic structure; very hard, very firm; common very fine roots; common very fine tubular pores; very few distinct gray (10YR 5/1) clay films on surfaces of peds and in pores; 20 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; very strongly acid.

Solum thickness is more than 80 inches. Average clay content in the particle-size control section is 35 to 40 percent. These soils remain saturated with aquic conditions from December to April in most years.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Iron concentrations in shades of yellow or brown range from 2 to 5 percent. Reaction is very strongly acid or strongly acid.

The Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Iron concentrations in shades of yellow or brown range from 2 to 8 percent. Reaction is very strongly acid or strongly acid.

The Eg part of the Eg/Btg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. The Btg part has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Iron concentrations in shades of yellow or brown range from 8 to 20 percent. Reaction is very strongly acid or strongly acid.

The Btg part of the Btg/Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1. The Eg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is clay loam, silty clay loam, and clay. Iron concentrations in shades of red, yellow, or brown ranges from 10 to 25 percent. Iron depletions in shades of gray, blue, or green range from 1 to 3 percent. Some pedons have Btg horizons with similar colors and textures. Some pedons have few fine hard-pitted concretions of calcium carbonate at depths greater than 55 inches. Reaction ranges from very strongly acid to moderately acid.

Babco Series

The Babco series consists of very deep, somewhat poorly drained, moderately slow permeable soils. These soils formed in sandy and loamy alluvial sediments on nearly level terraces of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Babco series are coarse-loamy, siliceous, semiactive, thermic Oxyaquic Alorthods

Typical pedon of Babco loamy fine sand (fig. 16) in an area of Tyden-Babco complex, 0 to 1 percent slopes; from the intersection of U.S. Highway 69 and Farm Road 326 in Kountze; 7.8 miles north on U.S. Highway 69 to the intersection with Farm Road 420; 3.8 miles east on Farm Road 420 to the intersection with county road; 1.3 miles north and east on county road to forest road; 0.6 mile north and east on forest road to pipeline; 30 feet north of pipeline on mound; USGS Kountze North topographic quadrangle; lat. 30 degrees 28 minutes 51 seconds N. and lat. 94 degrees 18 minutes 54.4 seconds W.

A—0 to 8 inches; very dark gray (10YR 3/1) loamy fine sand; weak fine subangular blocky structure; slightly hard, friable; many very fine and fine, and common medium roots; common fine and medium pores; 2 inches of slightly decomposed leaf litter on surfaces; 30 percent white (10YR 8/1) sand grains; extremely acid; clear smooth boundary.

E—8 to 12 inches; light brownish gray (10YR 6/2) loamy fine sand; weak medium subangular blocky structure; slightly hard, friable; common very fine and fine roots; common fine and medium pores; few very dark gray (10YR 3/1) organic stains on surfaces of peds; extremely acid; abrupt wavy boundary.

Bhs—12 to 16 inches; dark brown (7.5YR 3/2) fine sandy loam; weak medium subangular blocky structure; hard, firm; few very fine roots between peds; common very fine and fine pores; 10 percent weakly cemented dark brown (7.5YR 3/2), dark grayish brown (10YR 4/2), black (7.5YR 2/1), very dark grayish brown (10YR 3/2), and brown (7.5YR 5/3) nodules; 10 percent spots of light brown (7.5YR 6/4) fine sandy loam in the upper part; extremely acid; clear wavy boundary.

Bs—16 to 22 inches; brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; slightly hard, friable; few very fine roots between peds; common very fine discontinuous pores; 15 percent moderately cemented strong brown (7.5YR 5/8), brownish yellow (10YR 6/6), yellowish brown (10YR 5/8), brown (7.5YR 5/3), and yellowish red (5YR 5/6) nodules; 2 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries on surfaces of peds; 2 percent fine and medium distinct dark yellowish brown (10YR 4/4) iron concentrations with sharp boundaries along roots and pores; 3 percent fine and medium light gray (10YR 7/2) iron depletions with diffuse boundaries; very strongly acid; clear wavy boundary.

E'—22 to 43 inches; very pale brown (10YR 7/3) fine sandy loam; weak coarse prismatic structure parting to weak medium subangular blocky; hard, firm; common very fine roots between peds; many fine and medium pores; 1 percent fine distinct yellowish brown (10YR 5/6) iron concentrations with diffuse boundaries on surfaces of prisms; 3 percent fine distinct gray (10YR 5/1) iron depletions with diffuse boundaries; very strongly acid; gradual wavy boundary.

E/Btg—43 to 55 inches; 60 percent very pale brown (10YR 7/3) (E) fine sandy loam; 20 percent light brownish gray (10YR 6/2) (Btg); weak coarse prismatic structure parting to weak medium subangular blocky; hard, firm; few very fine roots between peds; common fine pores; few faint light brownish gray (10YR 6/2) clay films on surfaces of peds; 8 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries on surfaces of prisms; 2 percent fine prominent yellowish red (5YR 5/6) iron concentrations with clear boundaries on surfaces of peds in the Btg; 10 percent brittle material; very strongly acid; gradual wavy boundary.

Btg/Eg1—55 to 67 inches; 45 percent light brownish gray (10YR 6/2) (Btg) fine sandy loam; 40 percent light gray (10YR 7/2) (Eg1); weak coarse prismatic structure parting to weak medium subangular blocky; hard, firm; common very fine roots between peds; common very fine pores; few faint grayish brown (10YR 5/2) clay films on surfaces of peds; 10 percent medium and coarse distinct brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries on surfaces of peds; 5 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries on surfaces of peds in the Btg; the E part consists of streaks and pockets of albic material 1/8 to 1 inch wide between prisms and is a clay depletion resulting from aquic conditions; 10 percent brittle material; very strongly acid; gradual wavy boundary.

Btg/Eg2—67 to 80 inches; 50 percent light brownish gray (10YR 6/2) (Btg) fine sandy loam; 40 percent light gray (10YR 7/2) (Eg2); weak coarse prismatic structure parting to weak medium subangular blocky; very hard, firm; common very fine pores; few faint grayish brown (10YR 5/2) clay films on surfaces of peds; 8 percent fine and medium distinct brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries on surfaces of peds; 2 percent fine prominent strong brown (7.5YR 4/6) iron concentrations with clear boundaries on surfaces of peds in the Btg; the E part consists of streaks and pockets of albic material 1/8 to 1 inch wide between prisms and is a clay depletion because of aquic conditions; 25 percent brittle material; very strongly acid; gradual wavy boundary.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 2 to 8 percent. Aluminum saturation ranges from 70 to 100 percent throughout. CEC to clay ratio of the particle-size control section ranges from 0.30 to 0.40. Reaction is extremely acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. Slightly decomposed leaf litter on the surfaces ranges from 1 to 4 inches thick.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2.

The Bhs horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. Weakly to moderately cemented nodules in shades of red, yellow, brown, and black range from 5 to 25 percent. The percent of iron by ammonium oxalate ranges from 0.04 to 0.09.

The Bs horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 or 4. Texture is loamy very fine sand or fine sandy loam. Iron concentrations in shades of yellow or brown range from 1 to 4 percent. Iron depletions in shades of gray range from 0 to 5 percent. Weakly to moderately cemented nodules in shades of brown, yellow, and red range from 10 to 40 percent. The percent of iron by ammonium oxalate ranges from 0.04 to 0.08.

The E' horizon has hue of 10YR, value of 7 or 8, and chroma of 3 or 4. Texture is loamy fine sand or fine sandy loam. Iron concentrations in shades of brown range from 2 to 5 percent. Iron depletions in shades of gray range from 1 to 4 percent.

The E part of the E/Btg horizon has hue of 10YR, value of 7 or 8, and chroma of 3 or 4. The Btg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is loamy fine sand or fine sandy loam. Iron concentrations in shades of brown range from 8 to 15 percent. Iron depletions in shades of gray range from 2 to 10 percent.

The Btg part of the Btg/Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The Eg part of the horizon has hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 1 or 2. Texture is fine sandy loam or loam. Iron concentrations in shades of red, yellow, or brown range from 8 to 15 percent. Iron depletions in shades of gray, blue, and, green range from 2 to 10. Iron features are mostly in the Btg. Brittle material makes up 10 to 40 percent of the horizon.

Figure 16.—Profile of Babco loamy fine sand in an area of Tyden-Babco complex, 0 to 1 percent slopes.

Batson Series

The Batson series consists of very deep, moderately well drained, moderately permeable soils. These soils formed in nearly level, loamy and clayey alluvial sediments of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Batson series are fine-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs

Typical pedon of Batson very fine sandy loam, 0 to 1 percent slopes; from the intersection of Farm Road 770 and Texas Highway 105 in Batson; 1.7 miles south to Cemetery Road; 1.3 miles southeast on Cemetery Road to intersection with county road; 0.6 mile east and 2 miles south county road to private road; 0.4 mile northeast on private road; 40 feet west in woodland; USGS Thorson Gully topographic quadrangle; lat. 30 degrees 11 minutes 22 seconds N. and lat. 94 degrees 34 minutes 40 seconds W.

A—0 to 6 inches; very dark grayish brown (10YR 3/2) very fine sandy loam; weak fine subangular blocky structure; soft, friable; many very fine to coarse roots; many fine and medium interstitial and tubular pores; 1 percent distinct dark brown (7.5YR 3/3) organic stains along roots and pores; common worm and insect casts; moderately acid; clear smooth boundary.

E1—6 to 13 inches; light yellowish brown (10YR 6/4) very fine sandy loam; weak medium and coarse prismatic structure parting to weak medium subangular blocky; soft, friable; many very fine and fine, and common medium and coarse roots; common fine tubular pores; 1 percent distinct dark brown (7.5YR 3/3) organic stains along roots and pores; few ironstone nodules; common worm and insect casts; 1 percent fine distinct strong brown (7.5YR 5/6) iron concentrations with sharp boundaries on surfaces of peds; moderately acid; clear smooth boundary.

E2—13 to 29 inches; brownish yellow (10YR 6/6) very fine sandy loam; weak medium and coarse prismatic structure parting to weak medium subangular blocky; soft, friable; many very fine and fine roots; many fine and medium tubular pores; 2 percent fine distinct strong brown (7.5YR 5/6) iron concentrations with clear boundaries on surfaces of peds; 2 percent fine prominent strong brown (7.5YR 4/6) iron concentrations with sharp boundaries along roots; 1 percent fine black (7.5YR 2/1) masses of iron-manganese; 1 percent fine black (7.5YR 2/1) iron-manganese concretions; 2 percent ironstone nodules; 10 percent is light yellowish brown (10YR 6/4) very fine sandy loam; moderately acid; gradual wavy boundary.

E/Bt—29 to 35 inches; 65 percent yellowish brown (10YR 6/4) (E) very fine sandy loam; 20 percent brownish yellow (10YR 6/6) (Bt); moderate medium prismatic structure parting to weak fine and medium angular blocky; soft, friable; common very fine and fine roots; many fine tubular pores; few faint brownish yellow (10YR 6/6) clay films on surfaces of peds; 2 percent red (2.5YR 5/8) plinthite; common fine ironstone nodules; 1 percent black (2.5Y 2/1) iron-manganese concretions; 3 percent fine distinct brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 2 percent fine prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 10 percent is light yellowish brown (10YR 6/4) very fine sandy loam; moderately acid; clear smooth boundary.

Bt/Eg1—35 to 55 inches; 75 percent brownish yellow (10YR 6/6) (Bt) sandy clay loam; 20 percent light gray (10YR 7/2) (Eg); moderate medium prismatic structure parting to moderate medium angular blocky; hard, firm; common very fine and fine roots; common fine tubular pores; few prominent brownish yellow (10YR 6/6) clay films on surfaces of peds and in pores; 2 percent red (10R 4/8) plinthite; 3 percent fine ironstone nodules; 2 percent black (N 2.5/) iron-manganese concretions; 4 percent fine distinct yellowish brown (10YR 5/8) iron concentrations with sharp boundaries; 2 percent fine and medium prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; 5 percent of the E are gray (10YR 6/1) clay depletions with diffuse boundaries; extremely acid; gradual wavy boundary.

Bt/Eg2—55 to 78 inches; 65 percent brownish yellow (10YR 6/6) (Bt) very fine sandy loam; 25 percent very pale brown (10YR 8/2) (Eg); moderate medium prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm; common very fine roots; common fine tubular pores; few prominent brownish yellow (10YR 6/6) clay films on surfaces of peds and in pores; 2 percent red (10R 4/8) plinthite; 4 percent fine and medium prominent red (2.5YR 4/8) iron concentrations with clear boundaries; 5 percent medium prominent yellowish red (5YR 5/6) iron concentrations with clear boundaries; extremely acid; gradual wavy boundary.

Bt/Eg3—78 to 80 inches; 85 percent yellow (10YR 7/8) (Bt) very fine sandy loam; 15 percent very pale brown (10YR 8/2) (Eg); weak coarse prismatic structure; hard, firm; common very fine and fine roots; common fine tubular pores; few prominent reddish yellow (7.5YR 6/6) clay films on surfaces of peds and in pores and few distinct brownish yellow (10YR 6/6) clay films on surfaces of peds and in pores; 2 percent prominent very dark brown (7.5YR 2/2) iron-manganese stains on surfaces of peds and in pores; 3 percent red (10R 4/8) plinthite; 5 percent fine and medium prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries; 5 percent fine and medium prominent reddish yellow (5YR 6/8) iron concentrations with clear boundaries on surfaces of peds; 3 percent medium and coarse prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; extremely acid.

Solum thickness is more than 80 inches. Combined thickness of the A and E horizons ranges from 22 to 35 inches. Average clay content of the particle-size control section is 18 to 30 percent. Base saturation ranges from 40 to 60 percent. These soils remain saturated at a depth of 25 to 35 inches from December to March in most years. CEC to clay ratio of the particle-size control section ranges from 0.30 to 0.40. Reaction ranges from extremely acid to moderately acid throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Areas with value of 3 are less than 10 inches thick. Texture is very fine sandy loam or fine sandy loam.

The E horizons have hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 to 6. Texture is very fine sandy loam or fine sandy loam. Iron concentrations in shades of yellow and brown range from 1 to 5 percent. Ironstone nodules range from 2 to 5 percent.

The E part of the E/Bt horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 3 or 4. The Bt part has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. Texture is very fine sandy loam or fine sandy loam. Iron concentrations in shades of yellow or brown range from 2 to 5 percent. Ironstone nodules range from 3 to 8 percent.

The Bt part of the Bt/Eg horizons has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The Eg part has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. Texture in the upper part of the Bt/Eg horizons is very fine sandy loam, loam, or sandy clay loam. Texture in the lower part of the Bt/Eg horizons is very fine sandy loam, sandy clay loam, or clay loam. Plinthite ranges up to 2 percent. Iron concentrations in shades of red, yellow, or brown range from 10 to 25 percent.

Beaumont Series

The Beaumont series consists of very deep, poorly drained, very slowly permeable soils on flat coastal plains. They formed in clayey sediments of late Pleistocene age. These nearly level soils are on the Coast Prairie. Slopes are 0 to 1 percent. Soils of the Beaumont series are fine, smectitic, hyperthermic Chromic Dystraquerts

Typical pedon of Beaumont clay, 0 to 1 percent slopes, from the intersection of Texas Highway 105 and Texas Highway 326 in Sour Lake; 3.0 miles east on Texas Highway 105 to ranch road; 0.3 mile north, then 0.8 mile northeast; USGS Bevil Oaks topographic quadrangle; lat. 30 degrees 09 minutes 10.6 seconds N. and lat. 94 degrees 21 minutes 20.1 seconds W.

Ap—0 to 6 inches; dark gray (10YR 4/1) clay; moderate medium subangular blocky structure; extremely hard, extremely firm; many very fine and fine roots; common fine interstitial and tubular pores; 7 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries along roots and pores; very strongly acid; clear smooth boundary.

A—6 to 15 inches; dark gray (10YR 4/1) clay; moderate medium subangular blocky structure; extremely hard, extremely firm; common very fine and fine roots; common fine interstitial and tubular pores; few fine black (10YR 2/1) iron-manganese concretions; 5 percent fine prominent reddish yellow (7.5YR 6/6) iron concentrations with diffuse boundaries on surfaces of peds; 2 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries along roots and pores; very strongly acid; gradual smooth boundary.

Bg—15 to 38 inches; gray (10YR 5/1) clay; moderate medium prismatic structure parting to strong fine and medium angular blocky; extremely hard, extremely firm; common very fine and fine roots; common fine interstitial and tubular pores; few dark gray (10YR 4/1) organic coats on vertical surfaces of peds; few distinct pressure faces; few distinct intersecting slickensides; 1 percent fine black (10YR 2/1) iron-manganese concretions; 15 percent fine and medium prominent reddish yellow (7.5YR 6/6, 6/8) iron concentrations with sharp boundaries; very strongly acid; gradual wavy boundary.

Bssg1—38 to 55 inches; gray (10YR 6/1) clay; moderate medium prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine roots; common fine tubular pores; few distinct pressure faces; common distinct intersecting slickensides; 1 percent fine brown (10YR 4/3) and black (10YR 2/1) iron-manganese concretions; 25 percent fine and medium prominent brownish yellow (10YR 6/6, 6/8) iron concentrations with clear boundaries; moderately acid; gradual wavy boundary.

Bssg2—55 to 80 inches; gray (10YR 6/1) clay; weak medium and coarse prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine roots; common distinct intersecting slickensides; 1 percent fine black (10YR 2/1) iron-manganese concretions; 25 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; 5 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries; neutral.

Solum thickness is more than 80 inches. Weighted average clay content in the particle-size control section is 45 to 60 percent. When dry, cracks 1/2 inch to 1 1/2 inches wide extend from the surface to a depth of 12 inches or more. Cracks remain open for less than 60 cumulative days in most years. These soils remain saturated from the surface to 0.5 foot below the surface with aquic conditions from December to April in most years.

The Ap and A horizons have hue of 10YR, value of 4 or 5, chroma of 1 or 2. Iron concentrations in shades of brown range from 3 to 12 percent. Some pedons have Ap and A horizons with a reaction from pH 5.0 to 6.0 and occur mostly in the microknolls.

The Bg horizon has hue of 10YR or 2.5Y, value of 5 or 6, chroma of 1 or 2. Iron concentrations in shades of yellow or brown range from 5 to 15 percent. Reaction is very strongly or strongly acid. This horizon is absent in some pedons.

The Bssg horizon has hue of 10YR to 2.5Y, or N, value of 5 to 7, and chroma of 0 or 2. Iron concentrations in shades of red, yellow, or brown range from 15 to 30 percent. Some pedons have few fine hard-pitted concretions of calcium carbonate at depths more than 52 inches. Reaction ranges from strongly acid to neutral.

Belrose Series

The Belrose series consists of very deep, moderately well drained, moderately permeable soils. These soils are formed in loamy alluvial sediments on nearly level and very gently sloping terraces of late Pleistocene age. Slope ranges from 0 to 3 percent. Soils of the Belrose series are coarse-loamy, siliceous, superactive, thermic Oxyaquic Paleudults

Typical pedon of Belrose loamy very fine sand (fig. 17), 1 to 3 percent slopes; from the intersection of Farm Road 92 and Texas Highway 327 in Silsbee; 3.3 miles south on Farm Road 92; 0.5 mile east on county road; 0.8 mile east on forest road; 50 feet north in forest; USGS Silsbee topographic quadrangle; lat. 30 degrees 17 minutes 49.0 seconds N. and lat. 94 degrees 09 minutes 52.0 seconds W.

A—0 to 5 inches; brown (10YR 4/3) loamy very fine sand; weak fine subangular blocky structure; soft, very friable; many very fine to coarse roots; many fine and medium pores; few ant tubules; very strongly acid; clear smooth boundary.

Bw1—5 to 13 inches; yellowish brown (10YR 5/4) loamy very fine sand; moderate medium subangular blocky structure; soft, very friable; many very fine to coarse roots; many fine and medium pores; few ant tubules; very strongly acid; gradual wavy boundary.

Bw2—13 to 20 inches; yellowish brown (10YR 5/4) loamy very fine sand; moderate medium subangular blocky structure; soft, very friable; many very fine to coarse roots; many fine and common medium pores; few ant tubules; 5 percent very pale brown

(10YR 8/3) albic material in pockets along roots channels and in pores; strongly acid; gradual wavy boundary.

Bw/E1—20 to 31 inches; 85 percent yellowish brown (10YR 5/6) (Bw) loamy very fine sand; 15 percent very pale brown (10YR 8/3) (E); moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; many fine and medium roots; many fine and common medium pores; few ant tubules; the E part of this horizon consists of pockets of albic material 1/8 to 1/4 inch wide along root channels and in pores; strongly acid; diffuse wavy boundary.

Bw/E2—31 to 44 inches; 60 percent brownish yellow (10YR 6/6) (Bw) loamy very fine sand; 30 percent very pale brown (10YR 8/3) (E); moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common fine and medium roots; common fine and medium pores; 1 percent yellowish red (5YR 5/8) lamella that is 1/8 to 1/4 inch thick; few ant tubules; 6 percent fine distinct yellowish brown (10YR 5/4) iron concentrations with diffuse boundaries; 2 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries on surfaces of peds; the E part of this horizon consists of pockets of albic material 1/8 to 1/2 inch wide along root channels and in pores; strongly acid gradual wavy boundary.

E/Bt—44 to 63 inches; 50 percent very pale brown (10YR 8/3) (E) loamy very fine sand; 25 percent brownish yellow (10YR 6/6) (Bt); weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common fine and medium roots; common fine and medium pores; few ant tubules; common faint brownish yellow (10YR 6/6) (Bt) clay films on surfaces of prisms; 8 percent fine and medium distinct yellowish brown (10YR 5/4) iron concentrations with diffuse boundaries; 5 percent fine and medium prominent brownish yellow (10YR 6/8) (Bt) iron concentrations with diffuse boundaries; the E part of the horizon consists of streaks and pockets 1/2 inch to 4 inches wide; 10 percent of the total volume is very pale brown (10YR 8/2) (E) albic material in the interior; strongly acid; gradual wavy boundary.

Bt/E—63 to 75 inches; 55 percent brownish yellow (10YR 6/8) (Bt) very fine sandy loam; 35 percent very pale brown (10YR 8/3) (E); moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, firm; common fine and medium roots; common fine and medium pores; few prominent dark yellowish brown (10YR 4/6) clay films on surfaces of peds and in pores; 5 percent fine and medium distinct yellow (10YR 7/6) iron concentrations with diffuse boundaries; 3 percent fine prominent red (2.5YR 4/8, 5/8) iron concentrations with clear boundaries on surfaces of peds; 2 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries; the E part of the horizon consists of streaks and pockets of albic material 1/4 to 1/2 inch wide between peds; strongly acid; diffuse wavy boundary.

E'/Bt—75 to 80 inches; 50 percent very pale brown (10YR 8/3) (E') loamy fine sand; 30 percent reddish yellow (7.5YR 6/8) (Bt); moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common fine roots; common fine pores; few faint strong brown (7.5YR 5/8) clay films between sand grains in Bt; 10 percent fine and medium prominent brown (7.5YR 5/4) iron concentrations with diffuse boundaries; the E part of the horizon consists of streaks and pockets of albic material 1/4 to 1/2 inch wide between peds; 10 percent very pale brown (10YR 8/2) albic materials in vertical streaks in the E part; very strongly acid.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 4 to 10 percent. Depth to the argillic horizon ranges from 45 to 65 inches. Base saturation ranges from 20 to 30 percent. CEC to clay ratio ranges from 0.70 to 1.50. Reaction ranges from extremely acid to strongly acid throughout.

The A horizon has hue 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is loamy very fine sand or fine sandy loam.

The Bw horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 6. Texture is loamy very fine sand or fine sandy loam. Albic material as streaks and pockets or pockets range from 1 to 5 percent.

The Bw part of the Bw/E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma 4 to 6. The E part has hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 3 or 4. Texture is loamy very fine sand or fine sandy loam. Iron concentrations in shades of red, yellow, or brown range from 3 to 8 percent.

The E part of the E/Bt horizon has hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 3 or 4. The Bt part has hue of 7.5YR or 10YR, value 5 or 6, and chroma 4 to 6. Texture is loamy very fine sand or fine sandy loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 15 percent.

The Bt part of the Bt/E horizon has hue of 7.5YR or 10YR, value 5 to 7, and chroma 6 to 8. Texture is fine sandy loam, very fine sandy loam, or loam. The E part has hue of 7.5YR or 10YR, value of 7 or 8, and chroma of 2 or 3. Iron concentrations in shades of red, yellow, or brown range from 8 to 20 percent.

The E' part of the E'/Bt horizon has hue of 7.5YR or 10YR, value of 7 or 8, and chroma of 2 or 3. Texture is loamy fine sand or fine sandy loam. The Bt part has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 to 8. Iron concentrations in shades of red, yellow, or brown range from 8 to 20 percent.

Figure 17.—Profile of Belrose loamy very fine sand, 1 to 3 percent slopes.

Bevil Series

The Bevil series consists of very deep, poorly drained, very slowly permeable soils. These soils formed in clayey sediments on nearly level coastal plains of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Bevil series are fine, smectitic, thermic Chromic Dystraquerts.

Typical pedon of Bevil clay, 0 to 1 percent slopes; from the intersection of Texas Highway 787 and Texas Highway 770 in Saratoga; 1.5 miles southwest on Texas Highway 770 to forest road; 0.2 mile west on forest road; 50 feet south in forest; USGS Saratoga topographic quadrangle; lat. 30 degrees 16 minutes 12 seconds N. and lat. 94 degrees 33 minutes 17 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) clay; strong medium and coarse granular structure; very hard, very firm; many fine and medium roots; many fine and medium interstitial pores; 10 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries along roots and pores; very strongly acid; clear smooth boundary.

Bg—4 to 10 inches; grayish brown (2.5Y 5/2) clay; moderate medium subangular blocky structure; very hard, very firm; many fine roots; common fine and medium tubular pores; few distinct pressure faces; few faint slickensides; 15 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries along roots and pores; very strongly acid; clear smooth boundary.

Bssg1—10 to 22 inches; gray (N 5/) clay; moderate fine and medium angular blocky structure; extremely hard; extremely firm; common very fine and fine roots; common fine tubular pores; common distinct pressure faces; common distinct intersecting slickensides; 13 percent fine and medium prominent reddish yellow (7.5YR 6/6) iron concentrations with diffuse boundaries; 10 percent fine and medium prominent strong brown (7.5YR 4/4) iron concentrations with clear boundaries along roots and pores; very strongly acid; gradual wavy boundary.

Bssg—22 to 37 inches; light brownish gray (10YR 6/2) clay; moderate medium angular blocky structure; extremely hard; extremely firm; few very fine and fine roots; few fine tubular pores; common distinct pressure faces; common distinct intersecting slickensides; 20 percent fine and medium prominent reddish yellow (7.5YR 6/6) iron concentrations with diffuse boundaries; 10 percent fine and medium prominent strong brown (7.5YR 4/4) iron concentrations with clear boundaries along roots and pores; very strongly acid; gradual wavy boundary.

Bssg3—37 to 60 inches; gray (N 5/) clay; moderate medium angular blocky structure; extremely hard; extremely firm; few very fine and fine roots; few fine tubular pores; common distinct pressure faces; many prominent intersecting slickensides; 3 percent fine and medium rounded black (10YR 2/1) iron-manganese concretions; 10 percent fine and medium prominent reddish yellow (7.5YR 6/6) iron concentrations with diffuse boundaries; 10 percent fine and medium prominent yellowish red (5YR 5/6) iron concentrations with sharp boundaries; 30 percent yellowish brown (10YR 5/8) iron concentrations with diffuse boundaries; very strongly acid; gradual wavy boundary.

Bssg—60 to 80 inches; light gray (N 7/) clay; moderate medium angular blocky structure; extremely hard; extremely firm; few very fine roots; few fine tubular pores; common distinct pressure faces; many prominent intersecting slickensides; 2 percent fine and medium rounded black (10YR 2/1) iron-manganese concretions; 5 percent fine and medium prominent reddish yellow (7.5YR 6/6) iron concentrations with diffuse boundaries; 10 percent fine and medium prominent yellowish red (5YR 5/6) iron concentrations with sharp boundaries; 30 percent light yellowish brown (2.5Y 6/4) iron concentrations with diffuse boundaries; strongly acid; gradual wavy boundary.

Solum thickness is more than 80 inches. Texture is clay or silty clay throughout. Weighted average clay content of the particle-size control section is 45 to 60 percent.

When dry, cracks 0.5 to 1 inch wide occur at the surface and extend to a depth of 12 inches or more. Cracks remain open for less than 60 cumulative days in most years. These soils will have a water table at the surface to a depth of 1 foot from November to March and have aquic soil conditions in most years.

The A horizon has hue of 10YR, 2.5Y, or N, value of 4 or 5, and chroma of 0 to 2. Iron concentrations in shades of yellow and brown range from 2 to 20 percent. Reaction is extremely acid or very strongly acid.

The Bg horizon has hue of 10YR, 2.5Y, or N, value of 5 to 7, and chroma of 0 to 2. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Reaction is extremely acid or very strongly acid.

The Bssg horizon has hue of 10YR to 5Y, or N, value of 5 to 7, and chroma of 0 to 2. Iron concentrations in shades of red, yellow, or brown range from 7 to 50 percent. Reaction ranges from very strongly acid to moderately acid.

Bleakwood Series

The Bleakwood series consists of very deep, poorly drained, moderately permeable soils on flood plains. These nearly level soils formed in loamy alluvial sediments. Slopes are 0 to 1 percent. Soils of the Bleakwood are fine-loamy, siliceous, active, acid thermic Typic Endoaquepts

Typical pedon of Bleakwood fine sandy loam in an area of Iulus-Bleakwood complex, 0 to 1 percent slopes; from the intersection of U.S. Highway 69 and Farm Road 418 in Kountze; 4.0 miles east on Farm Road 418 to about 450 feet west of Village Creek; 75 feet south on meander swale; USGS Kountze North topographic quadrangle; lat. 30 degrees 23 minutes 52.0 seconds N. and lat. 94 degrees 15 minutes 55.7 seconds W.

A—0 to 3 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure; slightly hard, friable; many fine and medium, and common coarse roots; many fine and medium pores; 1 percent crawfish krotovinas; 3 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries; 3 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries along roots and in pores; very strongly acid; clear smooth boundary.

Bg1—3 to 14 inches; light brownish gray (10YR 6/2) loam; moderate medium subangular blocky structure; slightly hard, friable; many fine and medium, and common coarse roots; many fine and medium pores; 1 percent crawfish krotovinas; few thin strata of very pale brown (10YR 7/4) sand; 1 percent fine iron-manganese nodules; 20 percent fine and medium prominent brown (7.5YR 4/4) iron concentrations with sharp boundaries on surfaces of peds; 5 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries along roots and in pores; very strongly acid; clear smooth boundary.

Bg2—14 to 25 inches; gray (10YR 6/1) clay loam; moderate medium subangular blocky structure; hard, firm; common fine and medium roots; common fine pores; 1 percent crawfish krotovinas; few thin strata of very pale brown (10YR 7/4) and light brownish gray (10YR 6/2) sand; 2 percent fine iron-manganese nodules; 15 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; 5 percent fine prominent red (2.5YR 5/8) iron concentrations with sharp boundaries on surfaces of peds; very strongly acid; gradual smooth boundary.

Bg3—25 to 44 inches; gray (10YR 6/1) clay loam; weak coarse subangular blocky structure; very hard, very firm; common fine roots; common fine pores; 1 percent crawfish krotovinas; 8 percent medium and coarse prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; 5 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries; very strongly acid; gradual smooth boundary.

Bg4—44 to 58 inches; gray (10YR 6/1) clay loam; weak coarse subangular blocky structure; very hard, very firm; common fine roots; few thin strata of greenish gray (5B 6/1) and light gray (10YR 7/2) sand; 12 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; 5 percent fine prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries; 3 percent common fine prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; very strongly acid; gradual smooth boundary.

Bg5—58 to 80 inches; gray (10YR 6/1) loam; massive; hard, firm; 10 percent medium and coarse prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; 10 percent medium and coarse prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries; very strongly acid.

Solum thickness is more than 80 inches. Average clay content in the particle-size control section is 18 to 30. Reaction is very strongly acid or strongly acid throughout.

The A horizon has hue of 10YR, value of 4 to 5, and chroma of 2 to 4. Texture is fine sandy loam or loam. Iron concentrations in shades of brown range from 1 to 8 percent.

The Bg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is fine sandy loam, loam, or clay loam. Iron concentrations in shades of red, yellow, or brown range from 10 to 25 percent. Strata of loamy and sandy materials in shades of gray, blue, or green range from none to common.

Camptown Series

The Camptown series consists of very deep, very poorly drained and ponded, very slowly permeable soils. These nearly level soils formed in loamy and clayey sediments of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Camptown series are fine-silty, siliceous, active, thermic Typic Glossaqualfs.

Typical pedon of Camptown silt loam, 0 to 1 percent slopes; from the intersection of Texas Highway 105 and Texas Highway 326 in Sour Lake; 2.9 miles east on Texas Highway 105 to forest road; 0.8 mile south on forest road, then 0.7 mile east on forest road; 150 feet north in pine plantation; USGS Bevil Oaks topographic quadrangle; lat. 30 degrees 07 minutes 39.9 seconds N. and lat. 94 degrees 20 minutes 36.1 seconds W.

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam; weak coarse prismatic structure; hard, friable; many fine and common medium roots; many fine and medium interstitial pores; 20 percent crawfish krotovinas; 1 percent fine distinct yellowish brown (10YR 5/6) iron concentrations with clear boundaries along roots and pores; very strongly acid; clear smooth boundary.

Eg—4 to 13 inches; light gray (10YR 7/2) silt loam; weak medium prismatic structure parting to weak medium and coarse subangular blocky; hard, firm; common fine and medium roots; many fine and medium vesicular and tubular pores; 40 percent crawfish krotovinas; 3 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with diffuse boundaries along roots and pores; 2 percent fine prominent dark yellowish brown (10YR 4/4) iron concentrations with clear boundaries along roots and pores; 3 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries; 15 percent brittle material; very strongly acid; clear wavy boundary.

Btg/Eg1—13 to 24 inches; 50 percent light gray (10YR 7/1) (Btg) silt loam; 40 percent light gray (10YR 7/1) (Eg); weak medium and coarse prismatic structure; hard, firm; common very fine and fine roots; many fine and medium vesicular pores; 40 percent crawfish krotovinas; 8 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries throughout; 2 percent fine prominent dark yellowish brown (10YR 4/6) iron concentrations with clear boundaries along roots and pores; 1 percent fine prominent light bluish gray (10B 7/1) iron depletions with diffuse boundaries along roots; 2 percent fine rounded black (N 2.5/) iron-manganese concretions throughout; 15 percent brittle material; moderately acid; gradual wavy boundary.

Btg/Eg2—24 to 35 inches; 45 percent gray (10YR 6/1) (Btg) silt loam; 40 percent light gray (10YR 7/1) (Eg); weak medium prismatic structure; hard, firm; common fine roots; common fine tubular pores; very few faint gray (10YR 6/1) clay films on surfaces of peds and in pores; 1 percent fine irregular black (N 2.5/) iron-manganese concentrations with clear boundaries; 2 percent fine rounded black (N 2.5/) iron-manganese concretions; 35 percent crawfish krotovinas; 8 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 5 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries; 2 percent fine and medium prominent light bluish gray (10B 7/1) iron depletions with diffuse boundaries along roots; 2 percent brittle material; slightly acid; gradual wavy boundary.

Btg/Eg3—35 to 46 inches; 65 percent gray (10YR 6/1) (Btg) loam; 20 percent light gray (10YR 7/1) (Eg); weak medium prismatic structure parting to weak medium subangular blocky; very hard, very firm; common fine roots; common fine tubular pores; very few distinct gray (10YR 6/1) clay films on surfaces of peds and in pores; 1 percent fine irregular black (N 2.5/) iron-manganese concentrations with clear boundaries; 2 percent fine and medium rounded black (N 2.5/) iron-manganese concretions; 20 percent crawfish krotovinas; 10 percent fine and medium prominent brownish yellow (10YR 6/8) concentrations with diffuse boundaries; 3 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries; 2 percent fine and medium prominent light bluish gray (10B 7/1) iron depletions with diffuse boundaries along roots; slightly acid; gradual wavy boundary.

Btg/Eg4—46 to 69 inches; 55 percent light gray (2.5Y 7/1) (Btg) loam; 15 percent light gray (10YR 7/1) (Eg); weak medium and coarse prismatic structure; very hard, very firm; common very fine roots; common very fine and fine tubular pores; 10 percent crawfish krotovinas; few prominent gray (10YR 5/1) clay films on surfaces of peds and in pores; 2 percent fine rounded black (N 2.5/) iron-manganese concretions; 8 percent fine and medium rounded yellowish brown (10YR 5/8) iron concentrations with clear boundaries; 20 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 3 percent fine and medium prominent light bluish gray (10B 7/1) iron depletions with diffuse boundaries along roots and pores; few fine irregular masses of barite throughout; neutral; gradual wavy boundary.

Btg—69 to 80 inches; light gray (2.5Y 7/1) clay loam; weak coarse prismatic structure; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; 5 percent crawfish krotovinas; few prominent gray (10YR 5/1) clay films on surfaces of peds and in pores; 1 percent prominent black (N 2.5/) stains on surfaces of peds and in pores; 5 percent fine and medium irregular black (N 2.5/) iron-manganese concentrations with clear boundaries; 3 percent medium and coarse rounded black (N 2.5/) iron-manganese concretions; 20 percent medium and coarse prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 5 percent fine and medium prominent light bluish gray (10B 7/1) iron depletions with diffuse boundaries between peds; neutral; gradual wavy boundary.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 20 to 35 percent, and the percent of sand greater than very fine sand ranges from 10 to 15 percent. These soils remain ponded from December to May in most years and have aquic conditions during this period.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Crawfish bioturbation ranges from 10 to 30 percent. Iron concentrations in shades of yellow or brown range from 1 to 5 percent. Reaction is extremely acid or very strongly acid.

The Eg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Crawfish bioturbation ranges from 30 to 50 percent. Iron concentrations in shades of red, yellow, or brown range from 2 to 10 percent. Reaction is extremely acid or very strongly acid.

The Btg/Eg horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1. Eg part has similar colors as the Btg part. Texture is silt loam, loam, clay loam, or silty clay loam. Crawfish bioturbation ranges from 10 to 40 percent, with the greatest amount in the upper Btg/Eg horizons and decreases with depth. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent. Iron depletions in shades of gray, blue, or green range from 1 to 7 percent. Reaction ranges from strongly acid to neutral.

The Btg horizon has hue of 10YR or 2.5Y, value of 7, and chroma of 1. Texture is clay loam, silty clay, or clay. Crawfish bioturbation ranges from 5 to 15 percent. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent. Iron depletions in shades of gray, blue, or green range from 1 to 7 percent. Reaction ranges from strongly acid to neutral. This horizon is absent in some pedons.

Caneyhead Series

The Caneyhead series consists of very deep, very poorly drained, slowly permeable soils. These soils formed in loamy sediments on nearly level terraces of late Pleistocene age. Slopes range from 0 to 1 percent slopes. Soils of the Caneyhead series are fine-silty, siliceous, active, thermic Typic Glossaqualfs

Typical pedon of Caneyhead silt loam (fig. 18) in an area of Kenefick-Caneyhead complex, 0 to 1 percent slopes; from the intersection of U.S. Highway 96 and Texas Highway 327 in Silsbee; 3.3 miles south on U.S. Highway 96 to intersection with county road; 0.5 mile east on county road to forest road; 2.5 miles east on forest road, 400 feet east of road in forest; USGS Silsbee topographic quadrangle; lat. 30 degrees 17 minutes 45.0 seconds N. and lat. 94 degrees 08 minutes 21.0 seconds W.

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam; weak fine subangular blocky structure; slightly hard, friable; many fine, common medium, and few coarse roots; many fine and medium pores; 20 percent crayfish krotovinas; krotovinas are filled with a mixture of grayish brown (10YR 5/2) very fine sand, and light gray (10YR 7/1) and light brownish gray (10YR 6/2) silt loam; 2 percent fine distinct dark yellowish brown (10YR 4/6) iron concentrations with clear boundaries along roots and pores; very strongly acid; abrupt smooth boundary.

Eg/Btg—4 to 18 inches; 40 percent light gray (10YR 7/1) (Eg) silt loam; 30 percent light brownish gray (10YR 6/2) (Btg); moderate medium prismatic structure; hard, firm; common fine and medium and few coarse roots; many fine and medium pores; few faint clay films on surfaces of prisms in Btg; 30 percent crayfish krotovinas; krotovinas are filled with a mixture of light gray and light brownish gray silt loam; 15 percent fine and medium prominent reddish yellow (7.5YR 6/8) and 2 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries; 10 percent fine and medium prominent strong brown (7.5YR 5/6) iron concentrations with diffuse boundaries; the Eg part consists of albic material 1/2 inch to 3 inches wide between peds and is a clay depletion resulting from aquic conditions; 10 percent is brittle; very strongly acid; gradual wavy boundary.

Btg/Eg1—18 to 29 inches; 35 percent gray (10YR 6/1) (Btg) silt loam; 30 percent light gray (10YR 7/1) (Eg); moderate coarse prismatic structure; hard, firm; common fine and medium roots; few fine and medium pores; few faint gray (10YR 6/1) clay films on surfaces of peds; 30 percent crayfish krotovinas; 25 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with diffuse boundaries; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries; 7 percent fine prominent yellow (10YR 7/6) iron concentrations with diffuse boundaries; the Eg part consists of albic material 1/4 inch to 2 inches wide on surfaces of prisms and is a clay depletion resulting from aquic conditions; 10 percent is brittle; extremely acid; gradual wavy boundary.

Btg/Eg2—29 to 46 inches; 35 percent gray (10YR 6/1) (Btg) clay loam; 15 percent gray (10YR 6/1) (Eg); moderate coarse prismatic structure; hard, firm; common fine and medium roots; few fine and medium pores; common faint gray (10YR 6/1) clay films on surfaces of peds; 25 percent crayfish krotovinas; few fine threads and masses of barite; 25 percent medium and coarse prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries in matrix;15 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with diffuse boundaries; 8 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries; the Eg part consists of albic material of silt loam texture 1/4 inch to 1 inch wide on surfaces of prisms and is a clay depletion resulting from aquic conditions; extremely acid; diffuse wavy boundary.

Btg/Eg3—46 to 63 inches; 65 percent gray (2.5Y 6/1) (Btg) clay loam; 15 percent gray (10YR 6/1) (Eg); moderate coarse prismatic structure; hard, firm; common fine and few medium roots; few fine and medium pores; common distinct gray (10YR 6/1) clay films on surfaces of peds; 15 percent crayfish krotovinas; 2 percent fine masses of black (N 2.5/) iron-manganese; 20 percent medium and coarse prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries in matrix; 2 percent fine prominent grayish green (5G 5/2) iron depletions with clear boundaries; the Eg part consists of albic material of silt loam texture 1/4 to 1 inch wide on surfaces of prisms and is a clay depletion resulting from aquic conditions; very strongly acid; diffuse irregular boundary.

E'g/Btg—63 to 80 inches; 55 percent greenish gray (10GY 5/1) (E'g) very fine sandy loam; 20 percent greenish gray (10GY 5/1) (Btg); weak coarse prismatic structure; hard, firm; few fine roots; few fine and medium pores; few prominent gray (10YR 6/1) clay films on surfaces of prisms; few crayfish krotovinas; 2 percent fine masses of black (N 2.5/) iron-manganese; 12 percent fine prominent brown (7.5YR 5/4) and 10 percent fine prominent yellowish red (5YR 5/6) iron concentrations with diffuse boundaries in Btg; 5 percent fine and medium distinct grayish green (5G 5/2) iron depletions with diffuse boundaries; very strongly acid.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 20 to 35 percent, and the percentage of sand coarser than very fine sand is 3 to 14. CEC to clay ratio ranges from 0.40 to 0.50 in the particle-size control section. Aluminum saturation ranges from 35 to 65 percent throughout. ESP ranges from 0 to 5 percent throughout. Reaction is extremely acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Texture is very fine sandy loam or silt loam. Crayfish krotovinas range from 10 to 20 percent. Iron concentrations in shades of brown range from 2 to 10 percent.

The Eg part of the Eg/Btg horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. Texture is very fine sandy loam, silt loam, or loam. The Btg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Crayfish krotovinas range from 10 to 40 percent. Iron concentrations in shades of red, yellow, or brown, mainly in the Bt horizon, range from 5 to 20 percent.

The Btg part of the Btg/Eg horizons has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. Texture is silt loam, loam, clay loam, or silty clay loam. The Eg part has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 or 2. Crayfish krotovinas range from 15 to 40 percent. Iron concentrations in shades of red, yellow, or brown range from 10 to 35 percent. Iron depletions in shades of gray, green, or blue range from 2 to 10 percent. Iron concentrations are mainly in the Bt horizon.

The E'g part of the E'g/Btg horizon has hue of 2.5Y, 5BG, or 10GY, value of 5 to 7, and chroma of 1 or 2. Texture is very fine sandy loam or silt loam. The Btg part has hue 10YR, 2.5Y, or 10GY, value of 6 or 7, and chroma of 1 or 2. Crayfish krotovinas range from 1 to 15 percent. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent. Iron depletions in shades of gray, green, or blue range from 2 to 10 percent. Iron concentrations are mainly in the Btg horizon.

Figure 18.—Profile of Caneyhead silt loam in an area of Belrose-Caneyhead complex, 0 to 1 percent slopes.

Cypress Series

The Cypress series consists of very deep, very poorly drained, very slowly permeable soils on submerged areas. These soils formed in acidic, clayey alluvial sediments in lake beds, oxbows, and stream channels. Slopes are 0 to 1 percent. Soils of the Cypress series are fine, mixed, superactive, acid thermic Typic Fluvaquents.

Typical pedon of Cypress mucky clay, 0 to 1 percent slopes, frequently flooded; from the intersection of Texas Highway 92 and Farm Road 2937 in Silsbee; 3.3 miles north on Farm Road 2937 to county road; 0.5 mile east on county road to oil field service road; 0.5 mile north on oil field service road; 50 feet north in slough; USGS Deserter Baygall topographic quadrangle; lat. 30 degrees 26 minutes 54.0 seconds N. and lat. 94 degrees 09 minutes 42.3 seconds W.

A—0 to 12 inches; very dark grayish brown (10YR 3/2) mucky clay; massive; extremely hard, extremely firm; many very fine and fine, and common medium roots; common fine interstitial pores; 2 percent crawfish krotovinas; 3 percent distinct dark grayish brown (10YR 4/2) iron-manganese stains on surfaces of peds; extremely acid; clear smooth boundary.

Cg1—12 to 17 inches; dark gray (10YR 4/1) clay; massive; extremely hard, extremely firm; common very fine and fine roots; common very fine and fine interstitial pores; 5

percent crawfish krotovinas; 7 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries along roots and pores; 5 percent fine faint gray (10YR 6/1) iron depletions with diffuse boundaries; extremely acid; gradual smooth boundary.

Cg2—17 to 35 inches; gray (10YR 5/1) clay; massive; extremely hard, extremely firm; common very fine to medium roots; common very fine tubular pores; 5 percent crawfish krotovinas; 15 percent distinct dark gray (10YR 4/1) organic coats on surfaces of peds; 10 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries; extremely acid; gradual smooth boundary.

Cg3—35 to 43 inches; gray (2.5Y 6/1) clay; massive; extremely hard, extremely firm; common very fine to medium roots; common very fine tubular pores; 10 percent crawfish krotovinas; 2 percent prominent dark gray (10YR 4/1) organic coats on surfaces of peds; few thin strata 1/4 to 1/2 inch thick of silty clay loam; 12 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 6 percent fine prominent reddish brown (5YR 4/4) iron concentrations with clear boundaries; extremely acid; gradual wavy boundary.

Cg4—43 to 64 inches; gray (10YR 6/1) clay; massive; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; 10 percent crawfish krotovinas; 2 percent prominent dark gray (10YR 4/1) organic coats on surfaces of peds; 10 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 5 percent fine prominent brown (7.5YR 4/4) iron concentrations with clear boundaries; extremely acid; gradual wavy boundary.

Cg5—64 to 80 inches; gray (10YR 6/1) clay; massive; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; 2 percent crawfish krotovinas; 2 percent prominent dark gray (10YR 4/1) organic coats on surfaces of peds; 20 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 5 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries; extremely acid.

Solum thickness is more than 80 inches. Weighted average clay content in the particle-size control section is 40 to 50 percent. These soils are in sloughs and oxbow lakes associated with the Neches River and remain inundated from September to July in most years. Reaction is extremely acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. Texture is mucky clay, silty clay, or clay. Iron concentrations in shades of yellow or brown range from 2 to 10 percent.

The Cg horizon has hue of 10YR to 5Y or N, value of 5 or 6, and chroma 0 to 1. Texture is clay loam, clay, or silty clay. Thin strata of silt loam, silty clay loam, or clay loam range from few to common. Iron concentrations in shades of yellow or brown range from 5 to 20 percent. Iron depletions in shades of gray, green, or blue range from 0 to 5 percent.

Dallardsville Series

The Dallardsville series consists of very deep, moderately well drained, slowly permeable soils. These nearly level coastal plain soils formed in loamy sediments of the Lissie Formation of early to mid Pleistocene age. Slopes are 0 to 1 percent. Soils of the Dallardsville series are coarse-loamy, siliceous, semiactive, thermic Oxyaquic Paleudults.

Typical pedon of Dallardsville very fine sandy loam in an area of Waller-Dallardsville complex, 0 to 1 percent slopes; from the intersection of Texas Farm Road 92 and Texas Farm Road 1122 in Silsbee; 4.3 miles north on Texas Farm Road 92 to Gore Store Road; 2.75 west on Gore Store Road to county road; 0.85 mile north on county road, and 0.5 mile east on county road to forest road; 0.3 mile south and 0.7 mile east on forest road; 300 feet northwest on pipeline; 250 feet west of pipeline in forest; USGS Deserter Baygall topographic quadrangle; lat. 30 degrees 29 minutes 05 seconds N. and lat. 94 degrees 12 minutes 31 seconds W.

A—0 to 7 inches; yellowish brown (10YR 5/4) very fine sandy loam; weak medium subangular blocky structure; slightly hard, very friable; many very fine to coarse roots; many fine pores and medium pores; common masses of grayish brown (10YR 5/2); few wormcasts; 2 percent fine and medium rounded ironstone nodules; extremely acid; clear smooth boundary.

E—7 to 21 inches; pink (7.5YR 7/3) very fine sandy loam; weak coarse subangular blocky structure; slightly hard, very friable; many very fine to coarse; many fine and medium pores; few wormcasts; 2 percent fine rounded ironstone nodules; 4 percent fine distinct reddish yellow (7.5YR 6/8, 7/8) iron concentrations with sharp boundaries; extremely acid; clear smooth boundary.

E/Bt1—21 to 31 inches; 65 percent pink (7.5YR 7/3) (E) very fine sandy loam; 30 percent reddish yellow (7.5YR 6/8) (Bt); weak coarse prismatic structure parting to weak medium subangular blocky; hard, friable; many very fine and fine, and common medium roots; many fine and medium pores; few faint reddish yellow (7.5YR 6/6) clay films on surfaces of peds and in pores in the Bt part; few wormcasts; 2 percent fine rounded ironstone nodules; 3 percent fine and medium distinct reddish yellow (7.5YR 6/6) and 2 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with sharp boundaries between peds; extremely acid; clear irregular boundary.

E/Bt2—31 to 38 inches; 55 percent pink (7.5YR 7/3) (E), very fine sandy loam; 35 percent reddish yellow (7.5YR 6/6) (Bt); weak medium prismatic structure parting to weak fine and medium angular blocky; hard, friable; common very fine roots between peds; many fine and medium pores; few faint reddish yellow (7.5YR 6/8) clay films on surfaces of peds and in pores in the Bt part; 4 percent fine rounded ironstone nodules; 7 percent fine and medium prominent reddish yellow (7.5YR 6/8, 5YR 6/8) iron concentrations with clear boundaries between peds in the Bt part; 1 percent fine distinct light gray (10YR 7/2) iron depletions in the of E part; extremely acid; clear smooth boundary.

Bt/E—38 to 47 inches; 55 percent brownish yellow (10YR 6/6) (Bt), very fine sandy loam; 30 percent pink (7.5YR 7/3) (E); weak medium prismatic structure parting to weak fine and medium angular blocky; hard, firm; common very fine and fine roots between peds; common fine and medium pores; few distinct brownish yellow (10YR 6/6) clay films on surfaces of peds and in pores; 3 percent fine rounded ironstone nodules; 3 percent medium prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; 4 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries on surfaces of peds and in pores; 7 percent fine and medium distinct yellow (10YR 7/8) iron concentrations with diffuse boundaries on surfaces of peds in the Bt horizon; 1 percent fine faint light gray (10YR 7/2) clay depletions in the E part; 20 percent slightly brittle material 1 to 3 inches wide; very strongly acid; gradual wavy boundary.

Bt/Eg—47 to 61 inches; 75 percent brownish yellow (10YR 6/6) (Bt) very fine sandy loam; 15 percent light gray (10YR 7/1) (Eg); weak coarse prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm; common very fine roots between peds; many fine and medium and common coarse pores; few distinct reddish yellow (7.5YR 6/6) clay films on surfaces of peds and in pores; 2 percent fine red (2.5YR 4/8) plinthite; 5 percent medium prominent red (2.5YR 4/8) iron concentrations with abrupt boundaries on surfaces of peds; 3 percent medium prominent reddish yellow (5YR 6/8) iron concentrations with clear boundaries on surfaces of peds and in pores; 2 percent fine faint yellow (2.5Y 7/6) iron concentrations with diffuse boundaries on surfaces of peds in Bt; the E part of this horizon consists of albic material that is 1/8 to 1/2 wide on surfaces of prisms and is a clay depletion resulting from aquic conditions; 35 percent is brittle material 1 to 5 inches wide; very strongly acid; gradual wavy boundary.

Btx/Eg1—61 to 75 inches; 70 percent brownish yellow (10YR 6/6) (Btx) very fine sandy loam; 20 percent light gray (10YR 7/1) (Eg); moderate coarse prismatic structure parting to moderate medium and coarse angular blocky; very hard, very firm; common very fine roots in nonbrittle material; many fine and medium and common coarse pores; few distinct reddish yellow (7.5YR 6/6) clay films on surfaces of peds and in pores; 3 percent fine red (2.5YR 4/8) plinthite; 2 percent fine prominent red (2.5YR 4/6) iron concentrations with abrupt boundaries; 8 percent medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; 2 percent fine faint brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries on surfaces of peds; the Eg part consists of albic material 1/8 inch to 2 inches wide on surface of prisms and is a clay depletion resulting from aquic conditions; 60 percent is brittle; very strongly acid; gradual wavy boundary.

Btx/Eg2—75 to 80 inches; 65 percent reddish yellow (7.5YR 6/8) (Btx) very fine sandy loam; 25 percent light gray (10YR 7/1) (Eg); moderate very coarse prismatic structure parting to moderate coarse angular blocky; very hard, very firm; many fine to coarse pores; few distinct brownish yellow (10YR 6/8) clay films on surfaces of peds; 5 percent medium prominent yellowish red (5YR 5/8) iron concentrations on surfaces of peds; the E part consists of albic material 1/8 inch to 1 inch wide on surfaces of prisms with 5 percent fine faint very pale brown (10YR 8/2) and 1 percent fine prominent bluish gray (5B 6/1) iron depletions with clear boundaries in interior of the E part; the E part is a clay depletion resulting from aquic conditions; 65 percent of the horizon is brittle to very brittle; very strongly acid.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 10 to 18 percent. Depth to fragipan ranges from 50 to 65 inches. Base saturation ranges from 15 to 25 percent. CEC to clay ratio ranges from 0.30 to 0.40. Reaction ranges from extremely acid to strongly acid throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Where the value and chroma are 3 or less, the thickness of the A horizon is less than 7 inches. Texture is very fine sandy loam, fine sandy loam, or silt loam.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 or 4. Texture is very fine sandy loam, fine sandy loam, or silt loam. Iron concentrations in shades of yellow or brown range from 0 to 8 percent.

The E part of the E/Bt horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 3 or 4. Texture is very fine sandy loam, fine sandy loam, or silt loam. The Bt part has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 or 8. Iron concentrations in shades of yellow or brown range from 5 to 25 percent in the Bt part. Iron depletions in shades of gray range from 0 to 2 percent in the E part. Ironstone concretions range from 0 to 5 percent.

The Bt part of the Bt/E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 to 8. Texture is fine sandy loam, very fine sandy loam, silt loam, or loam. The E part has hue of 7.5YR or 10YR, value of 7 or 8, and chroma of 3. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent in the Bt part. Iron depletions in shades of gray, blue, or green range from 0 to 2 percent in the E part. Plinthite ranges from 0 to 3 percent. Brittle material ranges from 20 to 45 percent.

The Bt part of the Bt/Eg horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. Texture is fine sandy loam, very fine sandy loam, or loam. The Eg part has hue of 7.5YR or 10YR, value of 7 or 8, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from 10 to 25 percent in the Bt part. Iron depletions in shades of gray, blue, or green, range from 0 to 2 percent in the E part. Plinthite ranges from 0 to 3 percent. Brittle material ranges from 20 to 45 percent.

The Btx part of the Btx/Eg horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The Eg part has hue of 7.5YR or 10YR, value of 7 or 8, and chroma of 1 or 2. Texture is fine sandy loam, very fine sandy loam, loam, or silt loam. Iron concentrations in shades of red, yellow, or brown ranges from 10 to 25 percent. Iron depletions in shades of gray, blue, or green range from 1 to 5 percent. Plinthite ranges from 0 to 3 percent. Brittle material ranges from 60 to 85 percent.

Estes Series

The Estes series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in acid clayey and loamy alluvium on coastal plains. These flood plain soils have slopes ranging from 0 to 1 percent. Soils of the Estes series are fine, smectitic, thermic Aeric Dystraquerts.

Typical pedon of Estes clay, 0 to 1 percent slopes, frequently flooded; from the intersection of Texas Highway 326 and Texas Highway 105 in Sour Lake; 2.7 miles south on Texas Highway 326 to highway bridge over Pine Island Bayou; 300 feet east in woodland; USGS Franklin Lake topographic quadrangle; lat. 30 degrees 06 minutes 00 seconds N. and lat. 94 degrees 24 minutes 21 seconds W.

A—0 to 8 inches; brown (10YR 4/3) clay; strong fine and medium subangular blocky structure; extremely hard, extremely firm; many fine and medium, and common coarse roots; many very fine interstitial pores; 2 percent crawfish krotovinas; 3 percent fine rounded black (N 2.5/) iron-manganese concretions; 3 percent fine prominent strong brown (7.5YR 4/6) iron concentrations with clear boundaries along roots and pores; very strongly acid; clear smooth boundary.

Bw—8 to 23 inches; brown (10YR 5/3) clay; moderate medium prismatic structure parting to strong fine and medium angular blocky; extremely hard, extremely firm; common very fine to medium roots; common fine interstitial and tubular pores; 2 percent crawfish krotovinas; few distinct pressure faces; 1 percent fine rounded black (N 2.5/) iron-manganese concretions; 12 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries along roots and pores; 8 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with sharp boundaries on surfaces of peds; very strongly acid; gradual smooth boundary.

Bssg1—23 to 31 inches; light brownish gray (2.5Y 6/2) clay; weak medium prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine and fine roots; common fine tubular pores; 2 percent crawfish krotovinas; few distinct pressure faces; common distinct light brownish gray (2.5Y 6/2) intersecting slickensides; 20 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries on surfaces of peds; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries on surfaces of peds; very strongly acid; gradual wavy boundary.

Bssg2—31 to 45 inches; 50 percent light gray (2.5Y 7/1) clay; weak medium prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; 1 percent crawfish krotovinas; few distinct pressure faces; common distinct light gray (5Y 7/1) intersecting slickensides; 30 percent medium and coarse prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries in matrix; 20 percent fine prominent yellowish red (5YR 5/6) iron concentrations with sharp boundaries in matrix; 1 percent fine prominent light bluish gray (10B 7/1) iron depletions with clear boundaries along roots; very strongly acid; gradual wavy boundary.

Bssg3—45 to 62 inches; light gray (2.5Y 7/1) clay; weak medium prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; few distinct pressure faces; common distinct light gray (5Y 7/1) intersecting slickensides; 25 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 5 percent fine and medium prominent yellowish red (5YR 4/6) iron concentrations with sharp boundaries; 2 percent fine distinct light bluish gray (10B 7/1) iron depletions along roots; moderately acid; gradual wavy boundary.

Bssg4—62 to 80 inches; light gray (2.5Y 7/2) clay; weak medium and coarse prismatic structure parting to moderate medium subangular blocky; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; few distinct pressure faces; common prominent intersecting slickensides; 20 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 2 percent fine distinct light bluish gray (10B 7/1) iron depletions with clear boundaries along roots; common fine gypsum crystals; moderately acid.

Solum thickness is more than 80 inches. Average clay content of the particle-size control section is 40 to 50 percent. Cracks more than 1/2 inch wide extend from the surface to a depth of more than 12 inches when the soil is dry. The cracks remain open for less than 60 cumulative days in most years. Reaction is very strongly acid to moderately acid throughout. These soils are frequently flooded for periods from 7 days to 14 days on Pine Island and Little Pine Island Bayous to as long as 3 months on the Neches River.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Iron concentrations in shades of yellow and brown range from 1 to 5 percent. Some pedons have iron depletions in shades of gray in the microlow.

The Bw horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. Iron concentrations in shades of yellow and brown range from 5 to 20 percent. Some pedons have iron depletions in shades of gray in the microlow. Some pedons have Bg horizons that have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2.

The Bssg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from 8 to 30 percent. Iron depletions in shades of gray, blue, or green range from 1 to 5 percent. Some pedons have clay loam or silty clay loam stratification.

Evadale Series

The Evadale series consists of very deep, poorly drained, very slowly permeable soils. They formed in loamy and clayey sediments of Pleistocene age. These nearly level soils are on flats on the coastal plain. Slopes are less than 1 percent. The soils of the Evadale series are fine, smectitic, thermic Typic Glossaqualfs.

A typical pedon of Evadale silt loam, in an area of Evadale-Texla complex, 0 to 1 percent slopes; from the intersection of Texas Highway 326 and Texas Highway 105 in Sour Lake; 6.35 miles east on Texas Highway 105 to forest road; 3.1 miles north and 0.1 mile east on forest road; 50 feet south of road in forest; USGS Bevil Oaks topographic quadrangle; lat. 30 degrees 10 minutes 57.0 seconds N. and lat. 94 degrees 17 minutes 43.9 seconds W.

A—0 to 5 inches; grayish brown (10YR 5/2) silt loam; weak fine and medium granular structure; slightly hard, firm; many very fine and fine, and common medium and coarse roots; many fine and medium interstitial pores; 5 percent crawfish krotovinas; common fine wormcasts; 2 percent fine distinct yellowish brown (10YR 5/6) iron concentrations with clear boundaries along roots and pores; 2 percent fine distinct brownish yellow (10YR 6/6) iron concentrations with clear boundaries along roots and pores; 1 percent fine faint light brownish gray (10YR 6/2) iron depletions with sharp boundaries between peds; very strongly acid; abrupt smooth boundary.

Eg—5 to 16 inches; light brownish gray (10YR 6/2) silt loam; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, firm; many very fine and fine and common medium and coarse roots; common fine tubular pores and many medium tubular pores; 5 percent crawfish krotovinas; 5 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries along roots and pores; 2 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries along roots and pores and between peds; 5 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries; 3 percent fine prominent brown (7.5YR 4/4) iron concentrations with clear boundaries on surfaces of peds; very strongly acid; gradual wavy boundary.

Eg/2Btg—16 to 25 inches; 50 percent light gray (10YR 7/1) (E) silt loam; 20 percent gray (10YR 6/1) (Btg); weak medium and coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine to coarse roots throughout; common fine and medium tubular pores; 5 percent crawfish krotovinas; very few faint gray (10YR 6/1) clay films on surfaces of peds and in pores; 1 percent fine rounded black (10YR 2/1) iron-manganese concretions; 8 percent fine and medium prominent yellowish red (5YR 4/6) iron concentrations with sharp boundaries along roots and pores; 20 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; extremely acid; gradual wavy boundary.

2Btg/Eg—25 to 41 inches; 55 percent gray (10YR 5/1) (Btg) silty clay loam; 15 percent light gray (10YR 7/1) (Eg); moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; common very fine to coarse roots; common fine and medium tubular pores; 5 percent crawfish krotovinas; few distinct gray (10YR 5/1) clay films on surfaces of peds and in pores; few pressure faces; 1 percent fine cylindrical black (10YR 2/1) iron-manganese concretions; 8 percent medium prominent yellowish red (5YR 4/6) iron concentrations with sharp boundaries; 12 percent fine and medium prominent strong brown (7.5YR 5/8) with clear boundaries; 10 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries; extremely acid; gradual wavy boundary.

2Bssg1—41 to 59 inches; gray (2.5Y 6/1) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine to medium roots; common fine tubular pores; 5 percent crawfish krotovinas; few pressure faces; common intersecting slickensides; 5 percent fine and medium prominent yellowish red (5YR 4/6) iron concentrations with sharp boundaries; 15 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries; 8 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries on surfaces of peds; 2 percent fine prominent greenish gray (5G 6/1) iron depletions along roots; 5 percent streaks and pockets of light gray (10YR 7/1) albic material on surfaces of prisms; extremely acid; gradual wavy boundary.

2Bssg2—59 to 80 inches; gray (2.5Y 6/1) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine and fine roots; common fine tubular pores; 2 percent crawfish krotovinas; few pressure faces; common intersecting slickensides; 1 percent fine prominent light yellowish brown (2.5Y 6/4) iron stains on surfaces of peds and in pores; 1 percent fine rounded very dark gray (2.5Y 3/1) iron-manganese concretions; 2 percent fine and medium distinct very dark gray (2.5Y 3/1) iron-manganese concentrations; 15 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 8 percent fine prominent olive yellow (2.5Y 6/6) iron concentrations with clear boundaries; 3 percent fine and medium prominent greenish gray (5G 6/1) iron depletions with diffuse boundaries between peds; 2 percent fine and medium faint bluish gray (10B 6/1) iron depletions with diffuse boundaries between peds; strongly acid.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 35 to 45 percent. These soils remain saturated with aquic conditions from December to May in most years.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. Texture is silt loam or very fine sandy loam. Iron concentrations in shades of yellow or brown range from 2 to 10 percent. Reaction ranges from extremely acid to strongly acid.

The Eg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture is silt loam or loam. Iron concentrations in shades of yellow or brown range from 5 to 20 percent. Reaction ranges from extremely acid to strongly acid.

The Eg part of the Eg/2Btg horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. The 2Btg part has hue of 10YR, value of 6, and chroma of 1 or 2. Texture is silt loam or loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 20 percent. Iron concentrations are mostly in the Btg. Reaction is extremely acid or very strongly acid.

The 2Btg part of the Btg/Eg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1. The Eg part has hue of 10YR, value of 6 or 7, and chroma of 1. Texture is silty clay loam, silty clay, or clay. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent. Iron depletions in shades of gray or green range from 1 to 5 percent. Reaction ranges from extremely acid to moderately acid.

The 2Bssg horizon has hue of 10YR, 2.5Y, value of 5 or 6, and chroma of 1. Texture is silty clay loam, silty clay, or clay. Intersecting slickensides range from 15 to 40 percent. Iron-manganese concentrations and concretions in shades of brown and black range from 1 to 10 percent. Albic material ranges from 2 to 10 percent. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent. Iron depletions in shades of gray, green, or blue range from 1 to 5 percent. Reaction ranges from extremely acid to moderately acid.

Gist Series

The Gist series consists of very deep, moderately well drained, very slowly permeable soils on flats on coastal plains. They formed in loamy materials overlying clayey unconsolidated sediments. These soils are on nearly level areas. Slopes are 0 to 1 percent. These soils are on mounds 50 to 200 feet in diameter 1 to 3 feet above the intermound landscape. The soils of the Gist series are coarse-silty, siliceous, superactive, thermic Oxyaquic Glossudalfs.

Typical pedon of Gist silt loam in an area of Evadale-Gist complex, 0 to 1 percent slopes; from the intersection of Texas Highway 105 and Texas Highway 326 in Sour Lake; 6.4 miles east on Texas Highway 105 to oilfield service road; 0.9 mile south on service road and 0.2 mile west on forest road to pipeline; 0.1 mile south on forest road; 100 feet west on mound in forest; USGS China topographic quadrangle; lat. 30 degrees 07 minutes 23.2 seconds N. and lat. 94 degrees 18 minutes 08.5 seconds W.

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam; moderate medium granular structure; slightly hard, very friable; many very fine to coarse roots; many very fine to medium pores; few distinct dark gray (10YR 4/1) organic coats on surfaces of peds; extremely acid; clear smooth boundary.

E—4 to 11 inches; pale brown (10YR 6/3) silt loam; moderate medium subangular blocky structure; slightly hard, very friable; many very fine to coarse roots; many very fine and fine pores; 5 percent medium faint light yellowish brown (10YR 6/4) iron concentrations with sharp boundaries on surfaces of peds; 5 percent brittle material; extremely acid; clear smooth boundary.

E/Bt—11 to 15 inches; 70 percent pale brown (10YR 6/3) (E) silt loam; 25 percent yellowish brown (10YR 5/6) (Bt); moderate medium subangular blocky structure; slightly hard, friable; many very fine and fine, and common medium roots; many very fine and fine pores; 3 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with sharp boundaries on surfaces of peds; 2 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with sharp boundaries along roots; 10 percent brittle material; extremely acid; gradual wavy boundary.

Bt/E1—15 to 26 inches; 50 percent yellowish brown (10YR 5/6) (Bt) silt loam; 40 percent pale brown (10YR 6/3) (E); moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common very fine to medium roots; common very fine and fine pores; few distinct strong brown (7.5YR 5/6) clay films on surfaces of peds; 8 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries; 25 percent brittle material; extremely acid; gradual wavy boundary.

Bt/E2—26 to 41 inches; 65 percent yellowish brown (10YR 5/6) (Bt) silt loam; 20 percent pale brown (10YR 6/3) (E); moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common very fine and fine roots;

common very fine and fine pores; few distinct strong brown (7.5YR 5/6) clay films on surfaces of peds; 8 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries on surfaces of peds and along roots; 5 percent fine and medium distinct light brownish gray (10YR 6/2) iron depletions with diffuse boundaries on surfaces of peds; 30 percent brittle material; very strongly acid; gradual smooth boundary.

Btg1—41 to 53 inches; light brownish gray (10YR 6/2) clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; extremely hard, extremely firm; common very fine and fine roots; few distinct light brownish gray (2.5Y 6/2) clay films on surfaces of peds; 20 percent fine and medium prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; 3 percent fine prominent brownish yellow (10YR 6/6) iron concentrations with sharp boundaries; 2 percent streaks and pockets of light gray (10YR 7/2) albic material on vertical surfaces of peds; very strongly acid; gradual wavy boundary.

Btg2—53 to 80 inches; 50 percent light gray (10YR 7/1), 35 percent red (2.5YR 4/6), and 15 percent brownish yellow (10YR 6/6) clay loam; weak coarse subangular blocky structure; extremely hard, extremely firm; common very fine roots; few faint light brownish gray (2.5Y 7/2) clay films on surfaces of peds; very strongly acid.

Solum thickness is more than 80 inches. The average clay content in the particle-size control section is 10 to 15 percent and the percent of coarser than very fine sand is 5 to 10. These soils are saturated from December to March at a depth of 36 inches in most years. These soils are mounds 50 to 100 feet across and 2 to 3 feet higher than the intermound. Reaction is extremely acid or very strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2. Texture is very fine sandy loam or silt loam.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 4. Texture is very fine sandy loam, loam, or silt loam. Iron concentrations in shades of brown range from 1 to 8 percent. Brittle material ranges from 10 to 25 percent.

The E part of the E/Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. The Bt part has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. Texture is very fine sandy loam, loam, or silt loam. Iron concentrations in shades of yellow or brown range from 2 to 15 percent. Brittle material ranges from 25 to 35 percent.

The Bt part of the Bt/E horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. The E part has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is silt loam or loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Iron depletions in shades of gray range from 1 to 5 percent. Brittle material ranges from 25 to 40 percent.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is clay loam, silty clay loam, or clay. Iron concentrations in shades of red, yellow, or brown range from 5 to 30 percent.

Iulus Series

The Iulus series consists of very deep, moderately well drained, moderately permeable soils on flood plains. These soils formed in recent alluvium derived from coastal plain sediments. Slopes are 0 to 1 percent. Soils of the Iulus series are coarse-loamy, siliceous, active, thermic Fluvaquentic Dystrochrepts.

Typical pedon of Iulus loam in an area of Iulus-Bleakwood complex, 0 to 1 percent slopes, frequently flooded; from the intersection of U.S. Highway 69 and Farm Road 418 in Kountze; 4.0 miles east on Farm Road 418 to about 450 feet west of Village Creek; 75 feet south on natural levee; USGS Kountze North topographic quadrangle; lat. 30 degrees 23 minutes 52.0 seconds N. and lat. 94 degrees 15 minutes 55.7 seconds W.

A—0 to 4 inches; brown (10YR 5/3) loam; weak fine and medium granular structure; slightly hard, friable; many very fine to medium roots; common very fine and fine interstitial pores; extremely acid; clear smooth boundary.

Bw1—4 to 18 inches; yellowish brown (10YR 5/4) loam; weak coarse prismatic structure; hard, firm; common very fine to medium roots; common fine and medium tubular pores; extremely acid; gradual smooth boundary.

Bw2—18 to 31 inches; yellowish brown (10YR 5/6) fine sandy loam; weak coarse prismatic structure; slightly hard, very friable; common very fine roots; common very fine tubular pores; 2 percent fine distinct light brownish gray (10YR 6/2) iron depletions with clear boundaries; extremely acid; gradual smooth boundary.

Bw3—31 to 45 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak coarse prismatic structure; loose, very friable; common very fine roots; common very fine tubular pores; 5 percent fine distinct light gray (10YR 7/2) iron depletions with clear boundaries; extremely acid; gradual smooth boundary.

Bw4—45 to 58 inches; yellowish brown (10YR 5/4) fine sandy loam; weak coarse prismatic structure; slightly hard, very friable; common very fine roots; common very fine tubular pores; 7 percent fine distinct brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 5 percent fine distinct light gray (10YR 7/2) iron depletions; extremely acid; gradual smooth boundary.

Bg—58 to 80 inches; light gray (10YR 7/2) fine sandy loam; single grain; loose, very friable; common very fine roots; common very fine tubular pores; 20 percent medium and coarse prominent yellow (10YR 7/6) iron concentrations with clear boundaries; 8 percent fine prominent yellowish red (5YR 5/8) with clear boundaries; extremely acid.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 8 to 16 percent. Reaction is extremely acid or very strongly acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Texture is fine sandy loam or loam. Some pedons have few iron concentrations in shades of brown.

The Bw horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. Texture is fine sandy loam or loam. Iron concentrations in shades of red, yellow, or brown range from 1 to 10 percent. Iron depletions in shades of gray range from 1 to 5 percent.

The Bg horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. Texture is fine sandy loam, loam, or sandy clay loam. Iron concentrations in shades of red, yellow, or brown range from 2 to 20 percent. Some pedons have few thin strata of sand or loamy fine sand.

Jasco Series

The Jasco series consists of very deep, very poorly drained, very slowly permeable soils. These soils formed in loamy sediments of early to mid Pleistocene age. Slopes are 0 to 1 percent. Soils of the Jasco series are coarse-silty, siliceous, semiactive, thermic Vermic Fragiaqualfs.

A typical pedon of Jasco silt loam, 0 to 1 percent slopes; from the intersection of Farm Road 770 and Texas Highway 326; 1.0 mile west on Farm Road 770 to county road; 1.1 mile north on county road to forest road; 0.1 mile west on forest road; 40 feet North in woodland; USGS Kountze North topographic quadrangle; lat. 30 degrees 21 minutes 22.0 seconds N. and lat. 94 degrees 21 minutes 44.0 seconds W.

A—0 to 4 inches; light brownish gray (10YR 6/2) silt loam; weak medium and coarse prismatic structure parting to moderate fine granular; slightly hard, friable; many very fine and fine, and common medium roots; many fine and medium interstitial and tubular pores; 45 percent crawfish krotovinas; many fine rounded wormcasts; 8 percent fine distinct brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries along roots and pores; 5 percent fine and medium distinct very pale brown (10YR 8/3) iron concentrations with clear boundaries; 5 percent fine and medium distinct light gray (10YR 7/2) iron depletions with clear boundaries; very strongly acid; clear smooth boundary.

Eg—4 to 15 inches; light brownish gray (10YR 6/2) silt loam; moderate fine and medium subangular blocky structure; slightly hard, friable; many fine and medium roots; common fine vesicular and interstitial pores; 45 percent crawfish krotovinas; many fine rounded wormcasts; 1 percent fine rounded strong brown (7.5YR 5/6) iron-manganese concretions; 10 percent fine distinct brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries; 8 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with diffuse boundaries along roots and pores; 3 percent fine distinct very pale brown (10YR 8/3) iron concentrations with clear boundaries; 10 percent brittle material; strongly acid; gradual smooth boundary.

Exg—15 to 25 inches; light gray (10YR 7/2) silt loam; moderate fine and medium platy structure parting to strong fine angular blocky; hard, firm, moderately cemented, moderately strong; common very fine and fine roots in cracks; many fine to coarse vesicular pores; 25 percent crawfish krotovinas; common fine rounded wormcasts; 20 percent fine faint very pale brown (10YR 7/3) iron concentrations with clear boundaries; 15 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries along roots and pores; 8 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries; 70 percent brittle material; strongly acid; gradual wavy boundary.

Exg/Btxg—25 to 44 inches; 60 percent pinkish gray (7.5YR 7/2) (Exg) silt loam; 20 percent light gray (10YR 7/2) (Btxg); moderate medium platy structure parting to strong fine angular blocky; hard, firm, moderately cemented, moderately strong; common very fine roots in cracks; many fine to coarse vesicular pores; very few distinct gray (10YR 6/1) clay films; 10 percent fine prominent yellowish brown (10YR 5/4) iron concentrations with clear boundaries; 8 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries; 60 percent brittle material; strongly acid; gradual wavy boundary.

Btg/Eg—44 to 61 inches; 60 percent light gray (10YR 7/1) (Btg) silt loam; 33 percent light gray (10YR 7/2) (Eg); moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; common very fine roots; common fine and medium vesicular and tubular pores; very few distinct gray (10YR 6/1) clay films on surfaces of peds; 1 percent fine prominent black (10YR 2/1) stains on surfaces of peds and in pores; 1 percent fine rounded black (10YR 2/1) iron-manganese concretions; 12 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 5 percent fine distinct very pale brown (10YR 8/3) iron concentrations with clear boundaries; 25 percent brittle material; strongly acid; gradual wavy boundary.

E'xg/Btxg—61 to 80 inches; 60 percent pinkish gray (7.5YR 7/2) (E’xg) silt loam; 30 percent light brownish gray (2.5Y 6/2) (Btxg); moderate fine and medium platy structure parting to moderate fine and medium subangular blocky; hard, firm, moderately cemented, moderately strong; common very fine roots in cracks; common fine and medium vesicular pores; 5 percent crawfish krotovinas; very few faint gray (10YR 6/1) clay films on surfaces of peds; 2 percent fine rounded black (10YR 2/1) iron-manganese concretions; 10 percent fine prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; 60 percent brittle material; strongly acid.

Solum thickness is more than 80 inches. Depth to fragipan ranges from 15 to 25 inches. Average clay content of the particle-size control section is 8 to 12 percent, and the percent of sands larger than very fine sand ranges from 8 to 15 percent. Crawfish bioturbation ranges from 25 to 50 percent in the upper 25 inches. These soils are ponded from September to May with aquic conditions in most years. Reaction is extremely acid to strongly acid throughout.

The A horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Iron concentrations in shades of yellow or brown range from 1 to 8 percent.

The Eg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Iron concentrations in shades of yellow or brown range from 1 to 15 percent.

The Exg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is very fine sandy loam or silt loam. Iron concentrations in shades of yellow or brown range from 8 to 30 percent. Brittle material ranges from 60 to 70 percent of the horizon.

The Exg part of the Exg/Btxg horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 1 or 2. The Btxg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from 8 to 30 percent. Brittle material ranges from 60 to 85 percent of the horizon.

The Btg part of the Btg/Eg horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 1 or 2. The Eg part has hue of 10YR, value of 7 or 8, and chroma of 1 or 2. Texture is loam or silt loam. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent. This horizon is absent some pedons. Some pedons have Btxg/Exg horizons with similar colors and textures.

The E'xg part of the E'xg/Btxg horizon has hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 1 or 2. The Btxg part has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Brittle material ranges from 60 to 70 percent of the horizon.

Jayhawker Series

The Jayhawker series consists of very deep, poorly drained, very slowly permeable soils. These soils formed in loamy alluvial sediments on nearly level coastal plains of early to mid Pleistocene age. Slopes are 0 to 1 percent. Soils of the Jayhawker series are coarse-silty, siliceous, active, thermic Typic Paleaquults

Typical pedon of Jayhawker silt loam (fig. 19), 0 to 1 percent slopes; from the intersection of Farm Road 1003 and Farm Road 943 in Honey Island; 1.5 miles northwest on Farm Road 943 to forest road; 0.1 mile north, 0.6 mile east, and 0.6 mile north on forest road; 25 feet east in forest; USGS Village Mills topographic quadrangle; lat. 30 degrees 26 minutes 32 seconds N. and lat. 94 degrees 24 minutes 36 seconds W.

A—0 to 6 inches; grayish brown (10YR 5/2) silt loam; weak coarse subangular blocky structure; hard, firm; many very fine to medium roots mainly at top of horizon; many fine and medium pores; 20 percent is crawfish krotovinas; few wormcasts; 4 percent fine prominent strong brown and brown (7.5YR 5/8, 4/4) iron concentrations with sharp boundaries in root channels and pores; 1 percent fine prominent reddish yellow (7.5YR 6/6) iron concentrations with diffuse boundaries on surfaces of peds; very strongly acid; clear smooth boundary.

Eg—6 to 20 inches; light brownish gray (10YR 6/2) silt loam; moderate coarse prismatic structure parting to weak medium and coarse subangular blocky; slightly hard, friable; common fine and medium roots; common fine and medium pores; 20 percent is crawfish krotovinas filled with pinkish gray (7.5YR 7/2) very fine sand; 12 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with diffuse boundaries on surfaces of peds; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries in root channels and in pores; 10 percent of the total volume is brittle; very strongly acid; gradual wavy boundary.

Eg/Btg—20 to 36 inches; 50 percent gray (10YR 6/1) (Eg) silt loam; 30 percent gray (10YR 6/1) (Btg); moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine roots in nonbrittle material; common fine and medium pores; 15 percent is crawfish krotovinas filled with pinkish gray (7.5YR 7/2) very fine sand; 1 percent ironstone nodules; 15 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries on surfaces of peds in the Btg part; 5 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries on surfaces of peds; the Eg part is streaks and pockets of albic material 1/2 inch to 4 inches wide and is a clay depletion resulting from aquic conditions; 35 percent of the total volume is brittle;

brittle material is coarse prisms 4 to 14 inches wide; extremely acid; diffuse irregular boundary.

Btg/Eg—36 to 69 inches; 40 percent gray (10YR 6/1) (Btg) silt loam; 20 percent pinkish gray (7.5YR 7/2) (Eg); moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, very firm; common fine and medium roots in nonbrittle material; common fine and many medium pores; few faint light brownish gray (10YR 6/2) clay films on surfaces of peds and in pores; 10 percent is crawfish krotovinas filled with pinkish gray (7.5YR 7/2) and white (10YR 8/1) very fine sand and few krotovinas cupped with dark gray (10YR 4/1) clay; 12 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries; 18 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations on surfaces of peds; 10 percent fine reddish yellow (7.5YR 6/8) iron concentrations with diffuse boundaries in the Btg part; the Eg part is streaks and pockets of albic material 1/2 inch to 2 inches wide on vertical surfaces of prisms and is a clay depletion resulting from aquic conditions; 40 percent of the total volume is brittle; brittle material is coarse prisms 3 to 14 inches wide; extremely acid; clear wavy boundary.

Exg/Btxg—69 to 80 inches; 60 percent light gray (10YR 7/1) (Exg) silt loam; 20 percent light brownish gray (10YR 6/2) (Btxg); strong coarse prismatic structure; extremely hard, extremely firm, brittle; few very fine roots in nonbrittle material; many medium and coarse pores; few faint light brownish gray (10YR 6/2) clay films on horizontal surfaces of prisms in the Btxg part; few crawfish krotovinas; 15 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries; 2 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with sharp boundaries; 2 percent fine yellowish red (5YR 5/8) iron concentrations with sharp boundaries on surfaces of peds in the Btxg part; the Exg part is streaks and pockets of albic material 1 to 4 inches wide with white (10YR 8/1) very fine sand in interior and is a clay depletion resulting from aquic conditions; 70 percent of the total volume is brittle; very strongly acid.

Solum thickness is more than 80 inches. Depth to the fragipan ranges from 55 to 75 inches. Weighted average clay content of the particle-size control section is 8 to 15 percent and the sand content greater than very fine sand is 5 to 12 percent. Aluminum saturation ranges from 65 to 90 percent throughout. Exchangeable sodium percentage ranges from 0 to 4 percent. CEC to clay ranges from 0.50 to 0.60. Reaction is extremely acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2. Texture is very fine sandy loam or silt loam. Crawfish bioturbation ranges from 15 to 50 percent. Iron concentrations in shades of yellow or brown range from 2 to 10 percent.

The Eg horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 2. Texture is very fine sandy loam or silt loam. Crawfish bioturbation ranges from 15 to 50 percent. Iron concentrations shades of red, yellow, or brown range from 5 to 20 percent.

The Eg part of the Eg/Btg horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 1 or 2. The Btg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is very fine sandy loam or silt loam. Crawfish bioturbation ranges from 10 to 40 percent. Iron concentrations in shades of red, yellow, or brown range from 15 to 25 percent.

The Btg part of the Btg/Eg horizon has hue of 10YR, 2.5Y, or N/, value of 6, and chroma of 1 or 2. The Eg part has hue of 7.5YR, value of 7, and chroma of 2 or 3. Texture is very fine sandy loam or silt loam. Crawfish bioturbation ranges from 1 to 25 percent. Iron concentrations in shades of red, yellow, or brown range from 15 to 35 percent.

The Exg part of the Exg/Btxg horizon has hue of 10YR or 7.5YR, value of 7 or 8, and chroma of 1 or 2. The Btxg part has hue of 10YR, 2.5Y, or N/, value of 6, chroma of 1 or 2. Texture is silt loam or very fine sandy loam. Iron concentrations in shades of red

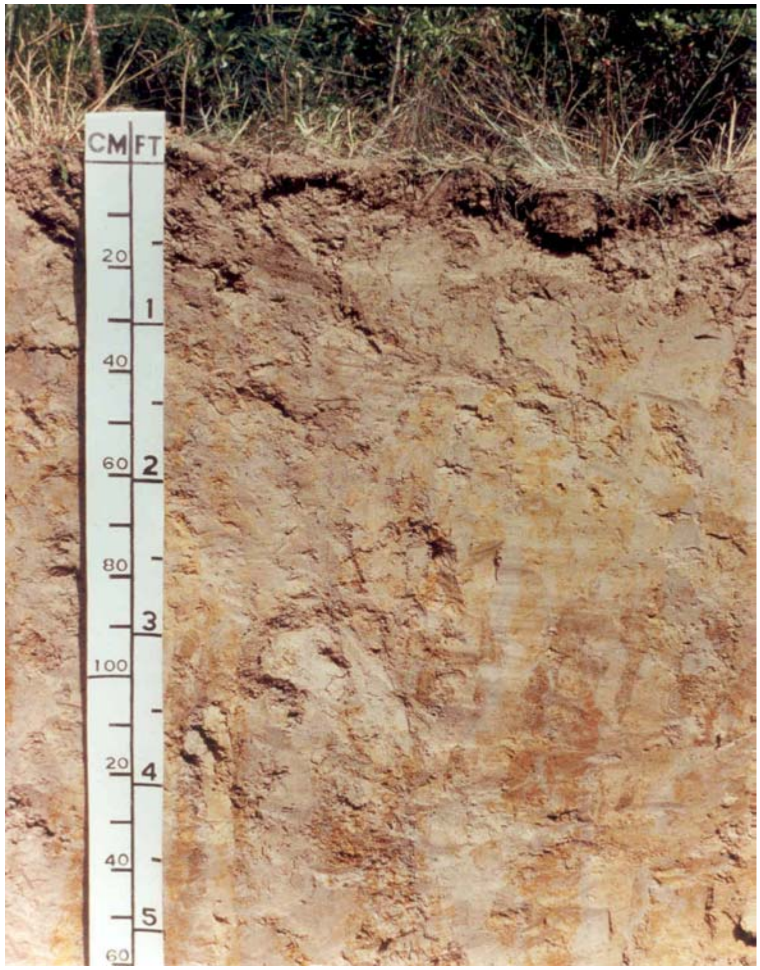


Figure 19.—Profile of Jayhawker silt loam, 0 to 1 percent slopes.

yellow, or brown ranges from 15 to 30 percent. Iron depletions in shades of gray, blue, and green range from 2 to 8 percent. Brittle material ranges from 60 to 80 percent and is slightly to very brittle.

Kenefick Series

The Kenefick series consists of very deep, well drained, moderately permeable soils. These nearly level to gently sloping soils formed in sandy and loamy alluvium of late Pleistocene age. Slope ranges from 0 to 3 percent. The soils of the Kenefick series are fine-loamy, siliceous, active, thermic Ultic Hapludalfs.

Typical pedon of Kenefick fine sandy loam, 1 to 3 percent slopes; from the intersection of U.S. Highway 96 and Texas Highway 327 in Silsbee; 3.3 miles south on U.S. Highway 96 to county road; 0.5 mile east on county road to forest road; 2 miles east on forest road 100 feet northwest in forest; USGS Silsbee topographic quadrangle; lat. 30 degrees 17 minutes 45 seconds N. and lat. 94 degrees 08 minutes 49.5 seconds W.

A—0 to 3 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; hard, friable; many very fine to medium roots; many fine and medium pores; strongly acid; clear smooth boundary.

E—3 to 18 inches; pale brown (10YR 6/3) fine sandy loam; weak fine and medium subangular blocky structure; hard, friable; many very fine to medium roots; many fine and medium pores; strongly acid; clear smooth boundary.

EB—18 to 26 inches; strong brown (7.5YR 5/6) fine sandy loam; weak coarse prismatic structure parting to weak medium and coarse angular blocky; hard, friable; common very fine and fine roots; common very fine and fine pores; strongly acid; clear smooth boundary.

Bt1—26 to 36 inches; red (2.5YR 4/6) clay loam; weak coarse prismatic and moderate medium and coarse angular blocky structure; hard, firm; common very fine and fine roots; common fine pores; few faint red (2.5YR 4/6) clay films on surfaces of peds and in pores; 3 percent fine prominent brownish yellow (10YR 6/6) iron concentrations with sharp boundaries on surfaces of peds; strongly acid; gradual smooth boundary.

Bt2—36 to 48 inches; red (2.5YR 4/8) clay loam; weak coarse prismatic structure parting to moderate medium and coarse angular blocky; hard, firm; few fine roots; common fine pores; few faint red (2.5YR 4/8) clay films on surfaces of peds and in pores; 1 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with sharp boundaries on surfaces of peds; very strongly acid; gradual smooth boundary.

Bt3—48 to 55 inches; yellowish red (5YR 5/8) loam; weak coarse prismatic structure parting to weak medium and coarse angular blocky; hard, firm; few fine roots; few fine pores; common prominent red (2.5YR 4/8) clay films on surfaces of peds and in pores; 1 percent distinct red (2.5YR 4/8) iron concentrations with sharp boundaries; 1 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with sharp boundaries on surfaces of peds; very strongly acid; gradual smooth boundary.

Bt4—55 to 61 inches; strong brown (7.5YR 5/8) fine sandy loam; weak coarse prismatic and weak coarse subangular blocky structure; hard, firm; few very fine roots; few fine pores; common prominent yellowish red (5YR 5/8) and red (2.5YR 4/8) clay films on surfaces of peds and in pores; 3 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with sharp boundaries on surfaces of peds; 2 percent streaks and pockets of very pale brown (10YR 7/3) (E) fine sandy loam along faces of prisms; very strongly acid; gradual smooth boundary.

Bt5—61 to 75 inches; strong brown (7.5YR 5/8) fine sandy loam; weak coarse prismatic structure parting to weak coarse subangular blocky; slightly hard, friable; common prominent strong brown (7.5YR 5/8) clay films on surfaces of peds and in pores; 2 percent fine distinct yellowish red (5YR 5/8) iron concentrations with sharp boundaries; 2 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with sharp boundaries on surfaces of peds; 5 percent streaks and pockets of very pale brown (10YR 7/3) (E) fine sandy loam along faces of prisms; very strongly acid; gradual smooth boundary.

Bt6—75 to 80 inches; brownish yellow (10YR 6/8) fine sandy loam; weak coarse prismatic structure parting to weak coarse subangular blocky; hard, friable; few continuous strong brown (7.5YR 5/8) clay films on surfaces of peds and in pores; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries on surfaces of peds; 2 percent fine prominent gray (10YR 6/1) iron depletions with sharp boundaries along pores; 5 percent streaks and pockets of very pale brown (10YR 7/3) (E) fine sandy loam along faces of prisms; very strongly acid.

Solum thickness is more than 80 inches. Base saturation ranges from 35 to 50 percent at 50 inches below the top of the argillic horizon. Average clay content ranges from 20 to 34 percent in the control section, and decreases by 20 percent or more from the maximum within 60 inches of the soil surface.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. Thickness is less than 7 inches when the value and chroma are less than 4. Reaction ranges from very strongly acid to moderately acid.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 or 4. Reaction ranges from very strongly acid to moderately acid.

The EB horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 or 8. Texture is very fine sandy loam or fine sandy loam. Reaction ranges from very strongly acid to moderately acid.

The upper Bt horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 6 or 8. Texture is loam, sandy clay loam, or clay loam. Iron concentrations range in shades of yellow or brown range from 0 to 8 percent. Iron-manganese concretions are none to few in shades of black or brown. Reaction ranges from very strongly acid to moderately acid.

The lower Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 6 or 8. Texture is fine sandy loam, loam, or sandy clay loam. Iron concentrations range in shades of red, yellow, or brown range from 1 to 10 percent. Streaks and pockets of albic material ranges from 0 to 5 percent. Some pedons have few siliceous pebbles, ironstone nodules, or plinthite segregations. Reaction ranges from very strongly acid to moderately acid. Some pedons are stratified with layers of fine sandy loam or loamy fine sand.

Kirbyville Series

The Kirbyville series consists of very deep, moderately well drained, moderately permeable soils. These nearly level and very gently sloping soils formed in loamy coastal plain sediments of mid Pleistocene age. Slopes are dominantly 1 to 2 percent but range from 0 to 2 percent. Soils of the Kirbyville series are fine-loamy, siliceous, semiactive, thermic Oxyaquic Paleudults.

Typical pedon of Kirbyville very fine sandy loam (fig. 20) in an area of Kirbyville-Niwana complex, 0 to 1 percent slopes in woodland; from the intersection of Texas Highway 92 and Farm Road 1122 in Silsbee; 4.3 miles north on Texas Highway 92 to Gore Store Road; 2.8 miles west on Gore Store Road to county road; 0.9 mile north on county road, then 1.0 mile east on county road to pipeline; 300 feet southwest in forest; USGS Deserter Baygall topographic quadrangle; lat. 30 degrees 29 minutes 23.0 seconds N. and lat. 94 degrees 12 minutes 41.1 seconds W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) very fine sandy loam; moderate medium granular structure; slightly hard, friable; many fine and very fine and common medium and coarse roots; common very fine and fine tubular pores; very few crawfish krotovinas filled with brown (7.5YR 5/3) fine sandy loam; few fine rounded wormcasts; few fine rounded iron-manganese nodules; 2 percent fine prominent strong brown (7.5YR 4/6) iron concentrations with sharp boundaries; 2 percent fine distinct dark brown (7.5YR 3/4) iron concentrations with sharp boundaries between peds; very strongly acid; clear smooth boundary.

E—5 to 11 inches; light yellowish brown (10YR 6/4) loam; weak medium prismatic structure; slightly hard, friable; many very fine and fine and common medium roots; common very fine and fine tubular pores; very few crawfish krotovinas filled with grayish brown (10YR 5/2) fine sandy loam; 1 percent fine rounded ironstone nodules; 2 percent fine distinct brown (7.5YR 4/4) iron concentrations with clear boundaries; 3 percent fine distinct light brownish yellow (10YR 6/4) iron concentrations with clear boundaries; 2 percent fine distinct strong brown (7.5YR 4/6) iron concentrations with clear boundaries between peds; very strongly acid; clear wavy boundary.

E/Bt—11 to 18 inches; 70 percent light yellowish brown (10YR 6/4) (E) loam; 30 percent brownish yellow (10YR 6/6) (Bt); weak medium prismatic structure parting to weak medium and coarse subangular blocky; hard, firm; many very fine and fine and common medium roots; few root channels filled with grayish brown (10YR 5/2) loam; common fine tubular pores; 5 percent crawfish krotovinas filled with grayish brown (10YR 5/2) loam; very few faint yellowish brown (10YR 5/6) clay films on surfaces of peds and in pores; 3 percent fine rounded ironstone nodules; 5 percent fine distinct yellowish brown (10YR 5/8) iron concentrations with clear boundaries; 3 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries between peds; very strongly acid; gradual wavy boundary.

Bt/E—18 to 25 inches; 50 percent yellowish brown (10YR 5/6) (Bt) loam; 25 percent light yellowish brown (10YR 6/4) (E); weak medium prismatic structure parting to weak medium subangular blocky; hard, firm; common very fine and fine roots; common fine and medium tubular pores; 4 percent crawfish krotovinas filled with gray (10YR 6/1) loam; few distinct yellowish brown (10YR 5/8) clay films on surfaces of peds and in pores; 5 percent fine rounded ironstone nodules; 2 percent fine plinthite segregations; 8 percent fine distinct strong brown (7.5YR 5/8) iron concentrations with clear boundaries between peds; 5 percent fine prominent yellowish red (5YR 5/6) iron concentrations with clear boundaries between peds; 12 percent fine and medium distinct light brownish gray (10YR 6/2) iron depletions with sharp boundaries in the E; strongly acid; gradual wavy boundary.

Btv/Eg1—25 to 33 inches; 60 percent brownish yellow (10YR 6/8) (Btv) loam; 15 percent light brownish gray (10YR 6/2) and 15 percent pale brown (10YR 6/3) (Eg); weak coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine and fine roots; common fine and medium vesicular and tubular pores; 6 percent crawfish krotovinas filled with gray (10YR 6/1) loam; few distinct yellowish brown (10YR 5/8) clay films on surfaces of peds and in pores; 5 percent fine rounded ironstone nodules; 7 percent fine red (2.5YR 5/8) plinthite segregations; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries between peds; 5 percent fine distinct strong brown (7.5YR 5/8) iron concentrations with clear boundaries between peds; very strongly acid; gradual wavy boundary.

Btv/Eg2—33 to 60 inches; 65 percent yellowish brown (10YR 5/8) (Btv) loam; 15 percent gray (10YR 6/1) (Eg); moderate medium prismatic structure parting to weak fine and medium angular blocky; hard, firm; common very fine and fine roots; many fine tubular pores and common medium coarse tubular pores; very few crawfish krotovinas filled with gray (10YR 6/1) loam; few distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/8) clay films on surfaces of peds and in pores; 5 percent fine rounded ironstone nodules; 8 percent fine and medium red (2.5YR 5/8) plinthite segregations; 8 percent fine distinct strong brown (7.5YR 5/8) iron concentrations with clear boundaries between peds; 12 percent fine prominent red (2.5YR 4/8) iron concentrations with sharp boundaries between peds; 5 percent brittle material; very strongly acid; gradual irregular boundary.

Btv/Eg3—60 to 80 inches; 50 percent brownish yellow (10YR 6/6) (Btv) clay loam; 35 percent light gray (10YR 7/1) (Eg); moderate medium prismatic structure parting to weak medium angular blocky; hard, firm; common very fine roots; common fine vesicular and tubular pores; few distinct yellowish brown (10YR 5/8) clay films on surfaces of peds and in pores; 7 percent fine rounded ironstone nodules; 8 percent fine and medium red (2.5YR 4/6 and 4/8) plinthite segregations; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries between peds; 2 percent fine prominent red (2.5YR 4/8) iron concentrations with sharp boundaries between peds; 10 percent fine and medium prominent gray (10YR 6/1) iron depletions with clear boundaries between peds; strongly acid.

Solum thickness is more than 80 inches. The weighted average clay content of the particle-size control section ranges from 18 to 30 percent. A perched water table occurs at a depth of 40 inches during December to March in most years. Base saturation ranges from 10 to 25 percent.

The A horizon has hue of 10YR, value 4 or 5, and chroma of 2 or 3. Texture is very fine sandy loam or loam. Iron concentrations in shades of brown range from 0 to 2 percent. Reaction is extremely acid or very strongly acid.

Figure 20.—Profile of Kirbyville very fine sandy loam in an area of Kirbyville-Niwana complex, 0 to 1 percent slopes.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. Texture is very fine sandy loam or fine sandy loam. Ironstone nodules range from 1 to 5 percent. Iron concentrations in shades of yellow or brown range from 2 to 10 percent. Reaction is extremely acid or very strongly acid.

The E part of the E/Bt has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. The Bt part has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is very fine sandy loam, fine sandy loam, or loam. Ironstone nodules range from 1 to 8 percent. Iron concentrations in shades of red, yellow, or brown range from 2 to 10 percent and occur mostly in the Bt part. Reaction is extremely acid or very strongly acid.

The Bt part of the Bt/E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The E part has hue of 10YR or 7.5YR, value of 6 to 8, and chroma of 3 or 4. Texture is loam or sandy clay loam. Ironstone nodules range from 1 to 8 percent. Plinthite segregations range from 1 to 4 percent. Iron concentrations in shades of red, yellow, and brown range from 2 to 20 percent. Iron depletions in shades of gray range from 0 to 5 percent. Iron concentrations occur mostly in the Bt part and the iron depletions are in the E part. Reaction is very strongly acid or strongly acid.

The Bt part of the upper Btv/Eg horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The E part has hue of 10YR, value of 6 to 8, and chroma of 1 or 2.

Texture is loam, sandy clay loam, or clay loam. Ironstone nodules range from 3 to 10 percent. Plinthite segregations range from 5 to 15 percent. Iron concentrations in shades of red, yellow, or brown range from 2 to 30 percent. Iron depletions in shades of gray range from 2 to 15 percent. Iron concentrations occur mostly in the Bt part and the iron depletions in the E part. Reaction is very strongly acid or strongly acid.

The Bt part of the lower Btv/Eg horizon has hue of 10YR, value of 6 or 7, and chroma of 3 to 6. The Eg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is loam, sandy clay loam, or clay loam. Plinthite segregations range from 5 to 20 percent. Iron concentrations in shades of red, yellow, or brown ranges from 5 to 30 percent. Iron depletions in shades of gray ranges from 2 to 15 percent. Iron concentrations occur mostly in the Bt part and the iron depletions in the E part. Reaction is very strongly acid or strongly acid.

Kountze Series

The Kountze series consists of very deep, moderately well drained, moderately permeable soils. These nearly level and very gently sloping soils formed in alluvial sediments of early to mid Pleistocene age. Slope ranges from 0 to 2 percent. Soils of the Kountze series are coarse-loamy, siliceous, active, thermic Oxyaquic Paleudults.

Typical pedon of Kountze very fine sandy loam, 0 to 2 percent slopes; from the intersection of Farm Road 1003 and Farm Road 943 in Honey Island; 10 miles west on Farm Road 943; 200 feet north in forest; USGS Jacks Creek South topographic quadrangle; lat. 30 degrees 30 minutes 47.0 seconds N. and lat. 94 degrees 31 minutes 53.0 seconds W.

A—0 to 6 inches; brown (10YR 4/3) very fine sandy loam; weak fine granular structure; soft, very friable; many very fine and fine, and common medium, and many coarse roots; many fine and medium interstitial pores; 1 percent fine distinct dark yellowish brown (10YR 4/6) iron concentrations with sharp boundaries along roots; few fine wormcasts; strongly acid; clear smooth boundary.

E—6 to 17 inches; light yellowish brown (10YR 6/4) very fine sandy loam; weak coarse subangular blocky structure; slightly hard, friable; many very fine and fine, and common medium and coarse roots; common fine tubular pores; 1 percent fine black (10YR 2/1) iron-manganese concretions; 2 percent fine ironstone nodules; 2 percent fine and medium faint dark yellowish brown (10YR 4/4) iron concentrations with sharp boundaries on surfaces of peds; strongly acid; gradual smooth boundary.

E/Bt—17 to 25 inches; 65 percent light yellowish brown (10YR 6/4) (E) very fine sandy loam; 30 percent strong brown (7.5YR 5/8) (Bt); weak medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; many very fine and fine, and common medium roots; many fine and medium tubular pores; few distinct reddish yellow (7.5YR 6/8) clay films on surfaces of peds and in pores; 2 percent fine irregular black (10YR 2/1) iron-manganese concretions; 2 percent fine rounded ironstone nodules; 2 percent fine faint dark yellowish brown (10YR 4/6) iron concentrations with sharp boundaries along roots and in pores; 3 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries; 1 percent fine and medium faint light brownish gray (10YR 6/2) iron depletions with clear boundaries in the E; very strongly acid; gradual smooth boundary.

Bt/E—25 to 43 inches; 60 percent reddish yellow (7.5YR 6/6) (Bt) loam; 30 percent pale brown (10YR 6/3) (E); moderate medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; common very fine and fine roots; common fine and medium tubular pores; few distinct strong brown (7.5YR 5/8) clay films on surfaces of peds and in pores; 1 percent fine black (10YR 2/1) iron-manganese concretions; 3 percent fine ironstone nodules; 7 percent fine distinct yellowish red (5YR 5/6) iron concentrations with clear boundaries; 2 percent fine and medium faint light brownish gray (10YR 6/2) iron depletions with clear boundaries in the E; very strongly acid; gradual wavy boundary.

Bt/Eg—43 to 54 inches; 65 percent brownish yellow (10YR 6/6) (Bt) loam; 15 percent gray (10YR 6/1) (Eg); weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable; few very fine and fine roots; many fine and medium tubular pores; few distinct yellowish brown (10YR 5/6) clay films on surfaces of peds and in pores; 3 percent by volume red (2.5YR 5/8) plinthite; 1 percent fine rounded black (10YR 2/1) iron-manganese concretions; 3 percent fine rounded ironstone nodules; 6 percent fine faint yellowish brown (10YR 5/6) iron concentrations with clear boundaries; 3 percent fine prominent red (2.5YR 5/8) iron concentrations with sharp boundaries; 10 percent fine faint light gray (10YR 7/1) iron depletions with diffuse boundaries in the Eg; very strongly acid; gradual wavy boundary.

Btv/Eg1—54 to 73 inches; 50 percent brownish yellow (10YR 6/6) (Btv) loam; 30 percent light gray (10YR 7/1) (Eg); weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; few very fine roots; common fine and medium tubular pores; few distinct yellowish brown (10YR 5/6) clay films on surfaces of peds and in pores; 8 percent red (2.5YR 5/8) plinthite; 4 percent fine ironstone nodules; 15 percent fine faint strong brown (7.5YR 5/6) iron concentrations with clear boundaries; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries; very strongly acid; gradual wavy boundary.

Btv/Eg2—73 to 80 inches; 55 percent brownish yellow (10YR 6/6) (Btv) silt loam; 30 percent light gray (10YR 7/1) (Eg); weak coarse prismatic structure; hard, firm; few very fine roots; many fine and medium tubular pores; few distinct brownish yellow (10YR 6/8) clay films on surfaces of peds and in pores; 8 percent red (2.5YR 4/8) plinthite; 2 percent fine prominent red (2.5YR 5/8) iron concentrations with sharp boundaries; 12 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries; 10 percent brittle material; very strongly acid.

Solum thickness is more than 80 inches. The weighted average clay content of the particle-size control section is 10 to 16 percent. CEC to clay ratio ranges from 0.40 to 0.55. Base saturation is 25 to 35 percent. Reaction is very strongly acid to strongly acid throughout.

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

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. Ironstone nodules range from 1 to 3 percent. Iron concentrations in shades of brown range from 1 to 4 percent.

The E part of the E/Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. The Bt part has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is very fine sandy loam, silt loam, or loam. Ironstone nodules range from 2 to 5 percent. Iron concentrations in shades of red, yellow, or brown range from 3 to 8 percent. Iron depletions in shades of gray range from 1 to 3 percent.

The Bt part of the Bt/E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The E part has hue of 10YR, value of 6 or 7, and chroma of 3 or 4. Texture is very fine sandy loam, silt loam, or loam. Ironstone nodules range from 1 to 5 percent. Iron concentrations in shades of red, yellow, or brown range from 3 to 10 percent. Iron depletions in shades of gray range from 1 to 5 percent. Iron concentrations are mostly in the Bt part and the depletions are in the E part.

The Bt part of the Bt/Eg horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The Eg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is very fine sandy loam, silt loam, or loam. Ironstone nodules range from 1 to 5 percent. Plinthite range from 1 to 4 percent. Iron concentrations in shades of red, yellow, or brown range from 5 to 15 percent. Iron depletions in shades of gray range from 5 to 10 percent. Iron concentrations are mostly in the Bt part and the depletions are in the E part.

The Btv part of the Btv/Eg horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 4 to 8. The E part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2.

Texture is very fine sandy loam, silt loam, or loam. Ironstone nodules range from 1 to 5 percent. Plinthite ranges from 5 to 10 percent. Iron concentrations in shades of red, yellow, or brown range from 15 to 25 percent.

Labelle Series

The Labelle series consists of very deep, somewhat poorly drained, very slowly permeable soils. These soils formed in loamy and clayey sediments on nearly level flat coastal plains of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Labelle series are fine, smectitic, hyperthermic Oxyaquic Vertic Argiudolls.

Typical pedon of Labelle silt loam in an area of Labelle-Spindletop complex, 0 to 1 percent slopes; from the intersection of Texas Highway 105 and Farm Road 770 in Batson; 1.7 miles south on Farm Road 770 to Cemetery Road; 1.2 miles south on Cemetery Road to county road; 0.6 mile east, then 2.4 miles south on county road to private road; 2.0 miles south on private road; 100 feet east on flat in pasture; USGS Thorson Gully topographic quadrangle; lat. 30 degrees 09 minutes 42.3 seconds N. and lat. 94 degrees 33 minutes 03.4 seconds W.

A—0 to 9 inches; very dark gray (10YR 3/1) silt loam; moderate fine and medium granular structure; slightly hard, friable; many very fine and fine, and common medium roots; common very fine interstitial pores; 1 percent fine prominent red (2.5YR 5/8) iron concentrations with sharp boundaries along roots and pores; strongly acid; clear smooth boundary.

Bt1—9 to 16 inches; black (10YR 2/1) silty clay loam; moderate fine and medium subangular blocky structure; hard, firm; common very fine and fine roots; few distinct black (10YR 2/1) clay films on surfaces of peds; common very fine and fine interstitial pores; 1 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries on surfaces of peds; moderately acid; gradual smooth boundary.

Bt2—16 to 24 inches; very dark gray (10YR 3/1) silty clay; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, very firm; common very fine and fine roots; common very fine tubular pores; few distinct very dark gray (10YR 3/1) clay films on surfaces of peds; few distinct pressure faces; few distinct slickensides; 3 percent fine prominent red (2.5YR 4/8) iron concentrations with sharp boundaries on surfaces of peds; 5 percent fine prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries on surfaces of peds; neutral; gradual wavy boundary.

Btssg1—24 to 42 inches; gray (10YR 6/1) silty clay; moderate medium prismatic structure parting to moderate fine and medium angular blocky; extremely hard, extremely firm; common very fine and fine roots; common very fine tubular pores; few prominent gray (10YR 5/1) clay films on surfaces of peds; few distinct pressure faces; common distinct slickensides; 20 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with sharp boundaries; neutral; gradual wavy boundary.

Btssg2—42 to 64 inches; gray (2.5Y 6/1) silty clay; moderate medium prismatic structure parting to moderate fine and medium angular blocky; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; very few prominent gray (10YR 6/1) clay films and very few prominent brownish yellow (10YR 6/6) clay films on surfaces of peds; few distinct pressure faces; common distinct intersecting slickensides; few fine concretions of calcium carbonate; 20 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; neutral; gradual wavy boundary.

Btssg3—64 to 80 inches; light gray (2.5Y 7/1) clay; moderate medium prismatic structure; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; very few distinct gray (2.5Y 6/1) clay films on surfaces of peds; few distinct pressure faces; common distinct gray (10YR 6/1) intersecting slickensides; few fine concretions of calcium carbonate; common fine black (10YR 2/1) iron-manganese concretions; 10 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries; 10 percent fine and medium prominent yellowish brown (10YR 5/8) iron concentrations with sharp boundaries; slightly alkaline.

Solum thickness is more than 80 inches. Average clay content of the particle-size control section is 35 to 45 percent. Depth of mollic epipedon ranges from 12 to 24 inches. These soils remain saturated at a depth of 24 inches from late December to March in most years.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from 0 to 2 percent. Reaction ranges from strongly acid to slightly acid.

The Bt horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. Texture is silty clay loam, silty clay, or clay. Iron concentrations in shades or red, yellow, or brown range from 2 to 20 percent. Reaction ranges from moderately acid to neutral.

The Btssg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations in shades of red, yellow, or brown range from 2 to 30 percent. Depth to secondary carbonates ranges from 42 to 70 inches. Reaction ranges from slightly acid to slightly alkaline.

League Series

The League series consists of very deep, somewhat poorly drained, very slowly permeable soils on flat coastal plains. They formed in thick clayey sediments of Pleistocene age. These nearly level soils are on the Coast Prairie. Slopes are 0 to 1 percent. The soils of the League series are fine, smectitic, hyperthermic Oxyaquic Dystruderts.

Typical pedon of League clay, 0 to 1 percent slopes; from the intersection of Texas Highway 105 and Texas Highway 326 in Sour Lake; 3.0 miles east on Texas Highway 105 to ranch road; 0.3 mile north, then 0.6 mile northeast, and 0.6 mile east, then 0.4 mile south on ranch road; 100 feet east in pasture; USGS Bevil Oaks topographic quadrangle; lat. 30 degrees 08 minutes 39.9 seconds N. and lat. 94 degrees 20 minutes 58.3 seconds W.

Ap—0 to 7 inches; very dark gray (10YR 3/1) clay; moderate fine and medium angular blocky structure; extremely hard, extremely firm; many fine and common medium roots; many fine interstitial and tubular pores; 2 percent faint dark gray (10YR 4/1) iron stains on surfaces of peds; 2 percent fine prominent dark yellowish brown (10YR 4/6) iron concentrations with sharp boundaries along roots and pores; very strongly acid; abrupt smooth boundary.

A—7 to 13 inches; very dark gray (10YR 3/1) clay; moderate fine and medium subangular blocky structure; extremely hard, extremely firm; common fine and many very fine roots; common fine tubular pores; few prominent pressure faces; 3 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries along roots and pores; very strongly acid; gradual wavy boundary.

Bss1—13 to 28 inches; very dark gray (10YR 3/1) clay; moderate fine and medium angular blocky structure; extremely hard, extremely firm; common very fine and fine roots; common very fine tubular pores; few prominent pressure faces; common prominent intersecting slickensides; 8 percent fine and medium prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries; 5 percent fine prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; strongly acid; gradual wavy boundary.

Bss2—28 to 45 inches; dark gray (10YR 4/1) clay; moderate medium prismatic structure parting to moderate fine and medium angular blocky; extremely hard, extremely firm; common very fine and fine roots; common very fine tubular pores; few prominent pressure faces; common prominent intersecting slickensides; 12 percent fine and medium prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries; slightly acid; gradual wavy boundary.

Bssg1—45 to 70 inches; gray (2.5Y 5/1) clay; moderate medium prismatic structure parting to moderate fine and medium angular blocky; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; few prominent pressure faces; common prominent intersecting slickensides; 1 percent fine black (10YR 2/1) iron-manganese concretions; 15 percent fine and medium prominent olive yellow (2.5Y 6/6) iron concentrations with clear boundaries; slightly acid; gradual wavy boundary.

Bssg2—70 to 80 inches; gray (2.5Y 6/1) clay; moderate medium prismatic structure parting to moderate fine and medium angular blocky; extremely hard, extremely firm; few prominent pressure faces; common prominent intersecting slickensides; few fine concretions of calcium carbonate; 4 percent fine black (10YR 2/1) iron-manganese concretions; 15 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; 5 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries; slightly acid.

The range in characteristics includes 50 percent or more of the pedon. Solum thickness is greater than 80 inches. Thickness of mollic colors ranges from 14 to 40 inches. The texture is silty clay or clay. Weighted clay in the particle-size control section ranges from 50 to 60 percent. When dry, cracks 1/2 to more than 1 inch wide extend from the surface to a depth of 12 inches or more. Cracks remain open for less than 60 cumulative days in most years. Slickensides and wedge-shaped peds begin at a depth ranging from 11 to 24 inches. Undisturbed areas have gilgai microrelief with microknolls 6 to 15 inches higher than the microlows. Distance from the center of the microhigh to the center of the microlow ranges from 3 to 12 feet in a hexagonal pattern.

Microhighs make up 5 to 25 percent of the pedon. Typically, colors in the microhighs have a value of 4 or more. Concretions of calcium carbonate occur mainly in clusters and range from 1 to 5 percent in the lower part of the microhighs in some pedons.

The Ap and A horizons have hue of 10YR, value of 2 or 3, and chroma of 1. Iron concentrations in shades of brown range from 0 to 10 percent. Reaction is extremely acid or very strongly acid. Some microknolls have a reaction of strongly acid.

The Bss horizon has hue of 10YR, value of 3 or 4, and chroma of 1. Iron concentrations in shades of red, yellow, or brown range from 1 to 20 percent. Iron depletions in shades of gray range from 0 to 5 percent. Reaction is very strongly acid or strongly acid.

The Bssg horizon has hue of 10YR, 2.5Y, or N, value of 5 to 7, and chroma of 0 to 1. Iron concentrations in shades of red, yellow, or brown range from 5 to 30 percent. Iron depletions in shades of gray range from 0 to 8 percent. Concretions of calcium carbonate range from 0 to 2 percent and 1 to 5 millimeters in diameter. Reaction ranges from strongly acid to neutral.

Lelavale Series

The Lelavale series consists of very deep, very poorly drained, very slowly permeable soils. These soils are on nearly level coastal plains and formed in loamy sediments of early Pleistocene age. Slopes are 0 to 1 percent. Soils of the Lelavale series are fine-loamy, siliceous, semiactive, thermic Typic Glossaqualfs.

Typical pedon of Lelavale loam, 0 to 1 percent slopes; from the intersection of Farm Road 787 and Farm Road 2798 in Votaw; 2 miles north on Farm Road 943 to forest company road; 1.8 miles east on forest road; 500 feet south in depression in woodland; USGS Votaw topographic quadrangle; lat. 30 degrees 27 minutes 19.0 seconds N. and lat. 94 degrees 38 minutes 39.7 seconds W.

Ag—0 to 4 inches; dark grayish brown (10YR 4/2) loam; moderate medium and coarse prismatic structure parting to moderate, medium, and fine granular; slightly hard; friable; common fine and medium, and few coarse roots; common fine and medium interstitial and tubular pores; few crawfish krotovinas filled with grayish brown (10YR

5/2) silt loam; 3 percent fine faint dark brown (7.5YR 4/3) iron-manganese concentrations with diffuse boundaries along roots and pores; extremely acid; abrupt smooth boundary.

Eg—4 to 12 inches; light brownish gray (10YR 5/2) silt loam; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; slightly hard; friable; few very fine and fine roots; common fine and medium tubular pores; few crawfish krotovinas filled with grayish brown (10YR 5/2) silt loam; 2 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries on surfaces of peds; 4 percent fine prominent yellow (10YR 7/6) iron concentrations with diffuse boundaries on surfaces of peds; 3 percent fine faint dark brown (7.5YR 4/3) iron-manganese concentrations with diffuse boundaries along roots and pores; extremely acid; clear smooth boundary.

Btg/Eg1—12 to 16 inches; 50 percent gray (10YR 6/1) (Btg) loam; 35 percent light brownish gray (10YR 6/2) (Eg); moderate medium prismatic structure; hard; firm; few very fine and fine roots; few fine and medium tubular pores; few crawfish krotovinas filled with gray (10YR 6/1) silt loam; common faint gray (10YR 6/1) clay films on surfaces of peds; 5 percent fine prominent yellowish red (5YR 5/6) iron concentrations with clear boundaries on surfaces of peds; 10 percent fine and medium prominent yellow (10YR 7/6) iron concentrations with diffuse boundaries on surfaces of peds; the Eg part of the horizon consists of albic material 1/4 to 1/2 inch wide and is a clay depletion because of aquic conditions; extremely acid; clear wavy boundary.

Btg/Eg2—16 to 31 inches; 35 percent gray (10YR 6/1) (Btg) clay loam; 25 percent light brownish gray (10YR 6/2) (Eg); moderate medium prismatic structure parting to moderate medium subangular blocky; hard; firm; few very fine and fine roots; few fine tubular pores; few crawfish krotovinas; common faint gray (10YR 6/1) clay films on surfaces of peds; 20 percent medium and coarse prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries on surfaces of peds; 5 percent fine prominent yellowish red (5YR 5/6) iron concentrations with clear boundaries on surfaces of peds; 10 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries on surfaces of peds; 5 percent fine prominent red (2.5YR 4/6) iron concentrations with clear boundaries on surfaces of peds; the Eg part of the horizon consists of albic material 1/8 to 1/2 inch wide and is a clay depletion because of aquic conditions; extremely acid; gradual wavy boundary.

Bt/Eg3—31 to 41 inches; 50 percent gray (10YR 6/1) (Bt) clay loam; 15 percent light brownish gray (10YR 6/2) (Eg); moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard; firm; few very fine roots; few very fine tubular pores; common faint gray (10YR 6/1) clay films on surfaces of peds; 25 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries in the Bt part; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries on surfaces of peds; 5 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries on surfaces of peds; the Eg part of the horizon consists of albic material 1/8 to 1/2 inch wide and is a clay depletion because of aquic conditions; extremely acid; gradual wavy boundary.

Bt—41 to 49 inches; 40 percent brownish yellow (10YR 6/8) and 25 percent yellowish red (5YR 5/8) and 15 percent red (2.5YR 4/8) clay; moderate medium prismatic structure parting to coarse fine and medium subangular blocky; few very fine roots; few fine tubular pores; few fine red (10R 4/6) plinthite segregations; common distinct red (2.5YR 4/6) clay films on surfaces of peds; 10 percent medium prominent gray and light brownish gray (10YR 6/1, 6/2) iron depletions with clear boundaries on surfaces of peds; 10 percent of the horizon is light gray (10YR 7/1) streaks and pockets of albic material 1/8 to 1/4 inch wide and is a clay depletion because of aquic conditions; extremely acid; gradual wavy boundary.

B'tg/E'g1—49 to 57 inches; 40 percent light gray (2.5Y 7/2) (B’tg) clay; 20 percent light gray (10YR 7/2) (E'g); moderate medium prismatic structure; fine and very fine roots; few very fine tubular pores; few fine red (10YR 4/6) plinthite segregations; common distinct gray (10YR 6/1) clay films on surfaces of peds; few rounded black (10YR 2/1) non-manganese concretions; 10 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries on surfaces of peds; 10 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries on surfaces of peds; 5 percent fine prominent red (2.5YR 4/6) iron concentrations with sharp boundaries on surfaces of peds; 20 percent of the horizon is strong brown (7.5YR 4/6) (Bt); the Eg part consists of streaks and pockets of albic material 1/8 to 1/2 inch wide and is a clay depletion because of aquic conditions; extremely acid; gradual wavy boundary.

B'tg/E'g2—57 to 80 inches; 30 percent light gray (2.5Y 7/1) (B’tg) clay loam; 20 percent light gray (10YR 7/2) (E'g); moderate medium prismatic structure; few very fine roots; few very fine tubular pores; common distinct gray (10YR 6/1) clay films on surfaces of peds; 25 percent medium and coarse prominent yellow (10YR 7/6) iron concentrations with diffuse boundaries in matrix; 15 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries on surfaces of peds; 10 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries on surfaces of peds; extremely acid; gradual wavy boundary.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 20 to 30 percent. Reaction is extremely acid throughout the solum.

The Ag horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Texture is silt loam or loam. Iron concentrations in shades of brown range from 2 to 5 percent.

The Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Texture is silt loam or loam. Iron concentrations in shades of yellow and brown range from 2 to 10 percent.

The Btg part of the Btg/Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The Eg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is silt loam, loam, or clay loam. Iron concentrations in shades of red, yellow, and brown range from 3 to 25 percent. The Bt part of the Bt/Eg horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 6 to 8. The Eg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is clay loam or clay. Iron concentrations in shades of red, yellow, and brown range from 5 to 25 percent. Iron depletions in shades of gray range from 10 to 25 percent.

The Bt horizon, present in most pedons, has a mottled matrix with hues of 2.5YR to 10YR, value of 4 to 6, and chroma of 6 to 8. Texture is clay loam or clay. Iron depletions in shades of gray range from 10 to 25 percent.

The B'tg part of the B'tg/E'g horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. The B’tg part also has 15 to 35 percent hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 6 to 8. The Eg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is clay loam or clay. Iron concentrations in shades of red, yellow, and brown range from 5 to 20 percent. Iron-manganese concretions range from 1 to 2 percent.

Leton Series

The Leton series consists of very deep, poorly drained, slowly permeable soils that formed in loamy alluvial deposits. These soils are on stream meanders and depressions on the coastal prairie of late Pleistocene age. They are saturated in winter and early spring. Water runs off the surface very slowly. Slopes are 0 to 1 percent. Soils of the Leton series are fine-silty, siliceous, superactive, thermic, Typic Glossaqualfs.

Typical pedon of Leton silt loam, 0 to 1 percent slopes; from the intersection of Texas 326 and Texas 105 in Sour Lake; 5.2 miles west on Texas 105; 150 feet south in pasture; USGS Sour Lake topographic quadrangle; lat. 30 degrees 09 minutes 37.0 seconds N. and lat. 94 degrees 29 minutes 03.0 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; slightly hard, friable; many very fine to medium roots; common fine interstitial pores; common wormcasts; 2 percent fine distinct dark yellowish brown (10YR 4/4) iron concentrations with clear boundaries along roots and pores; very strongly acid; abrupt smooth boundary.

Eg1—4 to 10 inches; gray (10YR 5/1) silt loam; moderate fine and medium subangular blocky structure; slightly hard, friable; common very fine and fine roots; common fine interstitial pores; 8 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries on surfaces of peds; 5 percent fine prominent strong brown (7.5YR 4/6) iron concentrations with clear boundaries along roots and pores; moderately acid; abrupt smooth boundary.

Eg2—10 to 22 inches; gray (10YR 6/1) silt loam; moderate fine and medium subangular blocky structure; hard, firm, brittle; common very fine roots; common very fine and fine vesicular and tubular pores; 10 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries on surfaces of peds; 10 percent brittle material; very strongly acid; clear wavy boundary.

Eg/Btg—22 to 28 inches; 50 percent light gray (10YR 7/1) (Eg) silt loam; 35 percent gray (10YR 6/1) (Btg); moderate fine and medium subangular blocky structure; hard, firm; common very fine roots; common very fine and fine tubular pores; very few faint gray (10YR 6/1) clay films on surfaces of peds and in pores; 10 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries along roots; 8 percent fine and medium prominent yellowish brown (10YR 5/6) iron concentrations with diffuse boundaries; very strongly acid; gradual wavy boundary.

Btg/Eg1—28 to 49 inches; 50 percent gray (10YR 6/1) (Btg) silt loam; 30 percent light gray (10YR 7/1) (Eg); moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; common very fine roots; common very fine and fine tubular pores; very few distinct gray (10YR 6/1) clay films on surfaces of peds and in pores; 12 percent fine prominent strong brown (7.5YR 5/6) with clear boundaries along roots and pores; 8 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries; very strongly acid; gradual wavy boundary.

Btg/Eg2—49 to 62 inches; 50 percent gray (10YR 6/1) (Btg) silty clay loam; 20 percent light gray (10YR 7/1) (Eg); weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; few very fine roots; common very fine tubular pores; few prominent gray (2.5Y 6/1) clay films on surfaces of peds and in pores; 20 percent medium and coarse prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; 8 percent fine and medium prominent yellowish red (5YR 4/6) iron concentrations with sharp boundaries on surfaces of peds; very strongly acid; gradual wavy boundary.

Btg—62 to 80 inches; light gray (10YR 7/1) silty clay loam; weak medium prismatic structure; very hard, very firm; few very fine roots; common very fine tubular pores; very few prominent gray (2.5Y 6/1) clay films on surfaces of peds and in pores; 5 percent streaks and pockets of light gray (10YR 7/2) albic material on surfaces of peds; 20 percent medium and coarse prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries; 5 percent fine prominent yellowish red (5YR 4/6) iron concentrations with clear boundaries; strongly acid.

Solum thickness is greater than 80 inches. Average clay content of the particle-size control section is 14 to 18 percent.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Iron concentrations in shades of yellow and brown range from 1 to 5 percent. Reaction ranges from very strongly acid to slightly acid.

The Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Iron concentrations in shades of yellow and brown range from 2 to 20 percent. Reaction ranges from very strongly acid to slightly acid.

The Eg part of the Eg/Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The Btg part has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Reaction ranges from very strongly acid to slightly acid.

The Btg part of the Btg/Eg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. The Eg part has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Texture is silt loam, loam, or silty clay loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 30 percent. Iron depletions in shades of gray, blue, or green range from 5 to 30 percent. Reaction ranges from very strongly acid to slightly acid.

The Btg horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1. Texture is silt loam, loam, or silty clay loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 30 percent. Iron depletions in shades of gray, blue, or green range from 1 to 5 percent. Reaction ranges from strongly acid to neutral.

Levac Series

The Levac series consists of very deep, somewhat poorly drained, very slowly permeable soils. These soils formed in silty and clayey sediments on nearly level flat coastal plains of late Pleistocene age. These soils have been leveled for rice irrigation. Slopes are 0 to 1 percent. Soils of the Levac series are fine, smectitic, hyperthermic Oxyaquic Vertic Hapludalfs

Typical pedon of Levac silt loam in an area of Labelle-Levac complex, 0 to 1 percent slopes; from the intersection of Texas Highway 105 and Farm Road 770 in Batson; 1.7 miles south on Farm Road 770 to Cemetery Road; 1.2 miles south on Cemetery Road to county road; 0.6 mile east, then 2.4 miles south on county road to private road; 2.0 miles south on private road; 1,000 feet in pasture on leveled mound; USGS Thorson Gully topographic quadrangle; lat. 30 degrees 09 minutes 25.0 seconds N. and lat. 94 degrees 32 minutes 45.9 seconds W.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; hard, firm; common very fine and fine roots; many very fine interstitial pores; very few very pale brown (10YR 8/2) silt coats in root channels and pores; neutral; abrupt smooth boundary.

E—4 to 13 inches; grayish brown (10YR 5/2) silt loam; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine and fine roots; common very fine and fine interstitial and tubular pores; very few very pale brown (10YR 8/2) silt coats in root channels and pores; 1 percent fine distinct very dark brown (7.5YR 2/2) iron-manganese concretions; 3 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries along roots; slightly alkaline; clear smooth boundary.

Bt—13 to 17 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm; common very fine and fine roots; common very fine tubular pores; few distinct grayish brown (10YR 5/2) clay films on surfaces of peds; few faint grayish brown (10YR 5/2) intersecting slickensides; 1 percent fine distinct very dark brown (7.5YR 2/2) iron-manganese concretions; 8 percent fine and medium prominent olive yellow (2.5Y 6/8) iron concentrations with clear boundaries; 5 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries along roots and pores; slightly alkaline; gradual wavy boundary.

Btg—17 to 33 inches; light brownish gray (10YR 6/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; extremely hard, extremely firm; common very fine and fine roots; common fine tubular pores; few prominent gray (10YR 5/1) clay films on surfaces of peds; few distinct pressure faces; few distinct gray (10YR 5/1) intersecting slickensides; common fine and medium calcium carbonate nodules; 3 percent fine prominent very dark brown (7.5YR 2/2) iron-manganese concretions; 10 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 8 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; slightly effervescent; slightly alkaline; gradual wavy boundary.

Btkg1—33 to 58 inches; light brownish gray (2.5Y 6/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; few distinct light brownish gray (2.5Y 6/2) clay films on surfaces of peds; few distinct light gray (2.5Y 7/2) intersecting slickensides; common fine and medium calcium carbonate nodules and masses; 3 percent fine prominent very dark brown (7.5YR 2/2) iron-manganese concretions; 12 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 8 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries; strongly effervescent; moderately alkaline; gradual wavy boundary.

Btkg2—58 to 72 inches; light brownish gray (2.5Y 6/2) clay; moderate medium prismatic structure parting to moderate medium subangular blocky; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; very few distinct light brownish gray (2.5Y 6/2) clay films on surfaces of peds; few distinct light gray (2.5Y 7/2) intersecting slickensides; common fine and medium calcium carbonate nodules and masses; 2 percent fine prominent black (10YR 2/1) iron-manganese concretions; 12 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; 5 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries; strongly effervescent; slightly alkaline; gradual wavy boundary.

B’tg—72 to 80 inches; light brownish gray (2.5Y 6/2) clay; weak medium and coarse prismatic structure parting to moderate medium subangular blocky; extremely hard, extremely firm; common very fine roots; common very fine tubular pores; very few distinct light brownish gray (2.5Y 6/2) clay films on surfaces of peds; few distinct light gray (2.5Y 7/2) intersecting slickensides; common fine carbonate nodules; 1 percent iron-manganese stains on surfaces of peds; 2 percent fine prominent black (10YR 2/1) iron-manganese concretions; 20 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; slightly effervescent; slightly alkaline.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 35 to 45 percent. Combined thickness of the A and E horizons is 4 to 19 inches. Depth to secondary carbonates ranges from 25 to 33 inches. When dry, cracks 1/4 to 1/2 inch wide extend to a depth of 20 inches. These soils remain saturated from 6 to 12 inches from December to March in most years.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. Texture is silt loam or loam. Reaction is slightly acid or neutral.

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2. Texture is silt loam or loam. Iron concentrations in shades of yellow or brown range from 1 to 8 percent. Reaction ranges from slightly acid to slightly alkaline.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2. Texture is silt loam or silty clay loam. Iron concentrations in shades of red, yellow, or brown range from 3 to 15 percent. Slickensides are few. Albic material ranges from 0 to 10 percent. Reaction is neutral or slightly alkaline.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Slickensides are few to common. Albic material ranges from 0 to 10 percent. Reaction is neutral or slightly alkaline.

The Btkg horizons, where present, have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Slickensides are few to common. Calcium carbonate masses and nodules are few to common. Reaction ranges from neutral to moderately alkaline.

The B’tg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma 1 or 2. Texture is silty clay or clay. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Slickensides are few to common. Calcium carbonate masses and nodules are few to common. Reaction ranges from neutral to moderately alkaline.

Manco Series

The Manco series consists of very deep, somewhat poorly drained, moderately permeable soils that formed in loamy alluvial sediments. These soils are on nearly level flood plains. Slopes range from 0 to 1 percent slopes. Soils of the Manco series are fine-silty, siliceous, active, acid thermic, Fluvaquentic Endoaquepts

Typical pedon of Manco loam, 0 to 1 percent slopes, frequently flooded; from the intersection of Farm Road 787 and Farm Road 770 in Saratoga; 1.5 miles east on Farm Road 770 to Rozier Park Road; 0.7 mile south on Rozier Park Road, then 2 miles east on park road; 900 feet southwest along Little Pine Island Bayou; USGS Sour Lake topographic quadrangle; lat. 30 degrees 14 minutes 19.8 seconds N. and lat. 94 degrees 28 minutes 55.0 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) loam; weak fine subangular blocky structure; soft, friable; many very fine and fine, and common medium roots; common very fine and fine interstitial pores; 1 percent crawfish krotovinas; common fine wormcasts; 2 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries; 3 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries; very strongly acid; abrupt smooth boundary.

Bw—4 to 19 inches; pale brown (10YR 6/3) loam; weak coarse subangular blocky structure; slightly hard, firm; many very fine and fine, and common medium roots; many very fine to medium tubular pores; 1 percent crawfish krotovinas; 2 percent fine very dark grayish brown (10YR 3/2) iron-manganese concentrations with clear boundaries; 2 percent fine very dark brown (10YR 2/2) iron-manganese concretions; 8 percent fine distinct brownish yellow (10YR 6/6) iron concentrations with clear boundaries; extremely acid; gradual smooth boundary.

Bg1—19 to 35 inches; gray (10YR 6/1) loam; weak fine subangular blocky structure; slightly hard, firm; common very fine and fine roots; common very fine tubular pores; 1 percent crawfish krotovinas; common fine very dark grayish brown (10YR 3/2) iron-manganese concretions; 5 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; 8 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries; very strongly acid; gradual wavy boundary.

Bg2—35 to 45 inches; light brownish gray (10YR 6/2) loam; weak fine subangular blocky structure; slightly hard, firm; common very fine roots; common very fine tubular pores; 1 percent crawfish krotovinas; few thin lenses of sand and masses of clayey material throughout; 3 percent fine brown (7.5YR 4/4) iron-manganese concretions; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries; 8 percent fine and medium prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries; very strongly acid; gradual wavy boundary.

Bg3—45 to 61 inches; light gray (2.5Y 7/1) loam; massive; hard, firm; common very fine and fine roots; common very fine tubular pores; 1 percent crawfish krotovinas; few thin lenses of sand and masses of clayey material throughout; 2 percent fine dark brown (7.5YR 3/2) iron-manganese concentrations with sharp boundaries; 8 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries; 20 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries; 10 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries; very strongly acid; gradual wavy boundary.

Bg4—61 to 71 inches; gray (2.5Y 6/1) loam; massive; hard, firm; few very fine and fine roots; few very fine tubular pores; 1 percent crawfish krotovinas; few thin lenses of sand and masses of clayey material; 3 percent fine dark brown (7.5YR 3/2) iron-manganese concentrations with clear boundaries; 8 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries; 10 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries; 3 percent fine distinct greenish gray (10Y 6/1) iron depletions with diffuse boundaries; 2 percent fine and medium distinct bluish gray (10B 6/1) iron depletions with clear boundaries; very strongly acid; gradual wavy boundary.

Bg5—71 to 80 inches; light gray (2.5Y 7/1) loam; massive; hard, firm; few very fine roots; few very fine tubular pores; 1 percent crawfish krotovinas; 3 percent fine dark brown (7.5YR 3/2) iron-manganese concentrations with clear boundaries; 20 percent coarse prominent brownish yellow (10YR 6/8) iron concentrations with sharp boundaries; 2 percent fine and medium prominent bluish gray (5B 6/1) iron depletions with diffuse boundaries; very strongly acid.

Solum thickness is more than 80 inches. Average clay content in the particle-size control section is 18 to 30 percent, and the sand content larger than very fine sand ranges from 10 to 15 percent. Stratification in the form of thin lenses of sandy material and masses of clayey material is throughout. These soils are flooded frequently for a duration of 7 days to 1 month in most years. Reaction is extremely acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam or loam. Iron concentrations in shades of brown range from 1 to 8 percent.

The Bw horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. Texture is silt loam or loam. Iron concentrations in shades of red, yellow, or brown range from 3 to 15 percent. Some pedons have iron depletions in shades of gray.

The Bg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is silt loam, loam, or clay loam. Iron concentrations in shades of red, yellow, or brown range from 10 to 35 percent. Iron depletions in shades of green, gray, or blue range from 1 to 10 percent.

McNeely Series

The McNeely series consists of very deep, excessively drained, very rapidly permeable soils. These soils formed in sandy sediments on gently sloping terraces of the Deweyville Formation of late Pleistocene age. Slopes range from 1 to 5 percent. Soils of the McNeely series are thermic, coated Typic Quartzipsamments

Typical pedon of McNeely sand, 1 to 5 percent slopes; from the intersection of Farm Road 92 and Texas Highway 327 in Silsbee; 3.0 miles west on Texas Highway 327 to the intersection with county road; 0.4 mile south on county road; 30 feet north in woodland; USGS Silsbee topographic quadrangle; lat. 30 degrees 20 minutes 44.2 seconds N. and lat. 94 degrees 13 minutes 51.7 seconds W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) sand; single grain; loose, very friable; many very fine, medium, and few coarse roots; many fine and medium pores; 15 percent of the total volume is a mixture of very pale brown (10YR 7/4), brownish yellow (10YR 6/6), and yellowish brown (10YR 5/8) sand throughout; very strongly acid; clear smooth boundary.

C1—5 to 22 inches; brown (10YR 5/3) sand; single grain; loose, very friable; many very fine, medium, and few coarse roots; 15 percent coarse root channels filled with very dark grayish brown (10YR 3/2) sand; strongly acid; clear wavy boundary.
C2—22 to 37 inches; light yellowish brown (10YR 6/4) sand; weak coarse prismatic structure; loose, very friable; many very fine and fine, and common medium roots; 2 percent fine masses of light gray (10YR 7/1) albic material along root channels; strongly acid; gradual wavy boundary.
C3—37 to 45 inches; very pale brown (10YR 8/4) sand; weak coarse prismatic structure parting; loose, very friable; common very fine and fine, and few medium roots; 2 percent grayish brown burned out root channels; 1 percent fine and medium distinct yellowish brown (10YR 5/6) iron stains with sharp boundaries on sand grains; 2 percent fine masses of light gray (10YR 7/1) albic material along root channels and in pores; strongly acid; diffuse wavy boundary.
C4—45 to 72 inches; very pale brown (10YR 8/3) sand; weak coarse prismatic structure; loose, very friable; common very fine, and few fine and medium roots; few thin brown (10YR 5/3) lamellae; 1 percent fine and medium prominent yellow (10YR 7/6) iron stains with sharp boundaries on sand grains; strongly acid; clear irregular boundary.
C5—72 to 80 inches; yellowish brown (10YR 5/4) sand; weak coarse prismatic blocky; loose, very friable; few very fine roots; 1 percent prominent very pale brown (10YR 7/4) iron stains on sand grains; strongly acid.

Solum thickness is more than 80 inches. The weighted average clay content of the particle-size control section ranges from 1 to 5 percent, and the sand content of the particle-size control section ranges from 90 to 95 percent. Texture is sand or loamy sand. Reaction is very strongly acid or strongly acid throughout.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 2 to 4. Areas with value of 3 and chroma of 2 or 3 are less than 10 inches thick.

The C horizon has hue of 7.5YR and 10YR, value of 5 to 7, and chroma of 3 to 6. Masses of iron accumulation in shades of red, yellow, and brown on sand grains range from 1 to 10 percent. Lamellae less than 1 centimeter thick range from 0 to 1 percent.

Niwana Series

The Niwana series consists of very deep, well drained, moderately permeable soils that formed in loamy sediments of early Pleistocene age. These soils occupy mounds 50 to 200 feet in diameter and are 1 to 3 feet above the intermound landscape. Slopes are 0 to 1 percent. Soils of the Niwana series are coarse-loamy, siliceous, semiactive, thermic Typic Paleudults.

A typical pedon of Niwana very fine sandy loam, in an area of Kirbyville-Niwana complex, 0 to 1 percent slopes; from the intersection of U.S Highway 69 and Texas Highway 326 in Kountze; 0.75 mile north on U.S. Highway 69 to the intersection with Farm Road 418; 5.7 miles east on Farm Road 418 to the intersection with county road; 0.1 mile north on county road to the intersection with Fire Tower Road; 2.1 miles northwest on Fire Tower Road to the intersection with county road; 3.5 miles north to the intersection with county road; 0.95 mile east on county road to gas pipe line; 100 feet south on pipe line and 50 feet west on mound in forest; USGS Deserter Baygall topographic quadrangle; lat. 30 degrees 29 minutes 21.0 seconds N. and lat. 94 degrees 12 minutes 09.0 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very fine sandy loam; moderate medium granular structure; soft, very friable; many very fine and fine, and common medium and coarse roots; many medium interstitial pores; very strongly acid; clear smooth boundary.
E1—3 to 8 inches; pale brown (10YR 6/3) very fine sandy loam; moderate medium subangular blocky structure; soft, very friable; common very fine and fine, and few

medium and coarse roots; common medium interstitial pores; few rounded ironstone nodules; very strongly acid; clear smooth boundary.

E2—8 to 17 inches; pale brown (10YR 6/3) very fine sandy loam; moderate medium subangular blocky structure; soft, very friable; common very fine and fine, and few medium and coarse roots; common medium interstitial and tubular pores; few rounded ironstone nodules; 5 percent fine and medium faint light yellowish brown (10YR 6/4) iron concentrations with sharp boundaries; very strongly acid; clear smooth boundary.

Bt/E1—17 to 28 inches; 65 percent brownish yellow (10YR 6/8) (Bt) loam; 35 percent pale brown (10YR 6/3) (E); moderate medium subangular blocky structure; slightly hard, firm; common very fine and fine, and few medium roots; common medium pores; common distinct yellow (10YR 7/8) clay films on surfaces of peds and in pores; common rounded ironstone nodules; 4 percent fine and medium distinct brownish yellow (10YR 6/6) iron concentrations with sharp boundaries; very strongly acid; gradual smooth boundary.

Bt/E2—28 to 36 inches; 70 percent brownish yellow (10YR 6/8) (Bt) loam; 30 percent pale brown (10YR 6/3) (E); moderate medium subangular blocky structure; slightly hard, firm; few fine and medium roots; few medium tubular pores; common faint brownish yellow (10YR 6/8) clay films on surfaces of peds and in pores; common rounded ironstone nodules; 2 percent fine prominent red (2.5YR 5/8) iron concentrations with sharp boundaries; very strongly acid; gradual smooth boundary.

Bt/E3—36 to 42 inches; 80 percent brownish yellow (10YR 6/8) (Bt) sandy clay loam; 20 percent pale brown (10YR 6/3) (E); moderate medium subangular blocky structure; hard, very firm; few fine and medium roots; few medium pores; common faint brownish yellow (10YR 6/8) clay films on surfaces of peds and in pores; common rounded ironstone nodules; 2 percent plinthite segregations; 2 percent fine red (2.5YR 5/8) iron concentrations with sharp boundaries; 1 percent fine light gray (10YR 7/1) iron depletions with sharp boundaries on vertical surfaces of peds in E; very strongly acid; gradual smooth boundary.

Bt/E4—42 to 60 inches; 70 percent brownish yellow (10YR 6/6) (Bt) loam; 15 percent pale brown (10YR 6/3) (E); moderate medium subangular blocky structure; slightly hard, firm; few fine roots; few medium pores; common distinct brownish yellow (10YR 6/8) clay films on surfaces of peds and in pores; common rounded ironstone nodules; 3 percent plinthite segregations; 2 percent fine red (2.5YR 5/8) iron concentrations with sharp boundaries; 10 percent fine and medium light gray (10YR 7/1) iron depletions with sharp boundaries on vertical surfaces of peds in the E part; very strongly acid; gradual smooth boundary.

Bt/E5—60 to 80 inches; 75 percent brownish yellow (10YR 6/6) (Bt) loam; 15 percent pale brown (10YR 6/3) (E); moderate medium subangular blocky structure; slightly hard, firm; few fine roots; few medium pores; common brownish yellow (10YR 6/8) clay films on surfaces of peds and in pores; common rounded ironstone pebbles; 3 percent plinthite segregations; 12 percent fine and medium light gray (10YR 7/1) iron depletions with sharp boundaries in the E part; very strongly acid.

Solum thickness is more than 80 inches thick. Weighted average clay content of the particle-size control section is 10 to 18 percent. These soils are on mounds 50 to 100 feet in diameter and are 1 to 3 feet above the intermound landscape. Reaction is very strongly acid or strongly throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Areas with value of 3, and chroma or 2 or 3 are less than 10 inches thick. Texture is very fine sandy loam or fine sandy loam.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is very fine sandy loam, fine sandy loam, or loam. Ironstone nodules range from 0 to 5 percent. Iron concentrations in shades of yellow and brown range from 1 to 15 percent.

The Bt part of the Bt/E horizon has hue of 10YR, value of 6, and chroma of 4 to 8. The E part has hue of 10YR, value of 6 or 7, and chroma of 3 to 6. Texture is fine sandy loam, loam or sandy clay loam. Ironstone nodules range from 0 to 5 percent. Plinthite ranges from 0 to 3 percent. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Iron depletions in shades of gray range from 1 to 12 percent.

Nona Series

The Nona series consists of very deep, poorly drained, slowly permeable soils. These soils are on nearly level intermound positions on coastal plains. These soils formed in loamy and clayey alluvial sediments of early to mid Pleistocene age. Slopes are 0 to 1 percent. Soils of the Nona series are fine-silty, siliceous, active, thermic Natric Vermaqualfs.

Typical pedon of Nona very fine sandy loam (fig. 21) in an area of Nona-Dallardsville complex, 0 to 1 percent slopes; from the intersection of Texas Highway 92 and Farm Road 2937 north of Silsbee; 4.3 miles north on Texas Highway 92 to Gore Store Road; 2.2 miles west on Gore Store Road to forest road; 0.2 mile south on forest road; 50 feet west in woodland; USGS Deserter Baygall topographic quadrangle; lat. 30 degrees 28 minutes 12.0 seconds N. and lat. 94 degrees 13 minutes 20.0 seconds W.

A—0 to 3 inches; grayish brown (10YR 5/2) very fine sandy loam; weak fine granular structure; soft, friable; many fine and medium roots; many fine interstitial and tubular pores; 30 percent crawfish krotovinas; few ironstone nodules; 7 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries along roots; extremely acid; clear smooth boundary.

Bg1—3 to 7 inches; gray (10YR 5/1) very fine sandy loam; 60 percent massive because of bioturbation, and 40 percent, undisturbed with weak coarse prismatic structure; slightly hard, friable; many fine, medium, and coarse roots; many fine and medium interstitial and tubular pores; 60 percent crawfish krotovinas filled with very pale brown (10YR 7/3) very fine sand and grayish brown (10YR 5/2) silt loam; 3 percent fine very dark gray (10YR 3/1) iron-manganese concretions; 28 percent fine and medium prominent brownish yellow (10YR 6/6 and 6/8) iron concentrations with diffuse boundaries; 8 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with diffuse boundaries; very strongly acid; clear smooth boundary.

Bg2—7 to 19 inches; light brownish gray (10YR 6/2) very fine sandy loam; 60 percent massive because of bioturbation, and 40 percent, undisturbed with weak coarse prismatic structure; slightly hard, friable; many fine roots; many fine tubular pores; 60 percent crawfish krotovinas filled with very pale brown (10YR 7/3) very fine sand and grayish brown (10YR 5/2) silt loam; few krotovinas cupped with dark gray (10YR 4/1) clay; 5 percent fine and medium rounded red (2.5YR 4/8) iron concentrations; 12 percent fine and medium prominent yellowish brown (10YR 5/6 and 5/8) iron concentrations with diffuse boundaries along roots; 8 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries along roots; very strongly acid; gradual wavy boundary.

Btg/Eg1—19 to 38 inches; 50 percent gray (10YR 6/1) (Btg) loam; 20 gray (10YR 6/1) (Eg); moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm; many fine and medium, and common coarse roots; common fine interstitial and tubular pores; few distinct pressure faces; few distinct gray (10YR 5/1) clay films on surface of peds; 20 percent crawfish krotovinas filled with brown (10YR 5/3) very fine sand and light brownish gray (10YR 6/2) silt loam; few krotovinas are cupped with dark grayish brown (10YR 4/2) clay; 4 percent fine very dark gray (10YR 3/1) ironstone nodules; 1 percent fine red (2.5YR 4/8) plinthite; 3 percent fine and medium prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; 12 percent fine and medium prominent yellowish brown (10YR 5/6) iron concentrations with diffuse boundaries on surfaces of peds; 8 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries on surfaces of peds; very strongly acid; gradual wavy boundary.

Btg/Eg2—38 to 53 inches; 30 percent gray (10YR 6/1) (Btg) clay loam; 15 percent gray (10YR 6/1) (Eg); moderate coarse prismatic structure parting to strong medium and coarse subangular blocky; very hard, very firm; common fine to coarse roots; many fine tubular pores; few distinct gray (10YR 5/1) slickensides; few distinct gray (10YR 5/1) clay films on surfaces of peds; 10 percent crawfish krotovinas filled with brown (10YR 5/3) very fine sand and light brownish gray (10YR 6/2) silt loam; 4 percent ironstone nodules; 1 percent fine red (2.5YR 4/6) plinthite; 20 percent medium and coarse prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; 12 percent fine and medium prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries; 10 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; 3 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries; very strongly acid; gradual wavy boundary.

Btg/Eg3—53 to 72 inches; 50 percent light gray (10YR 7/1) (Btg) loam; 15 percent light gray (10YR 7/1) (Eg); weak coarse prismatic structure parting to strong medium and coarse subangular blocky; very hard, very firm; common fine roots; common very fine tubular pores; few prominent gray (10YR 6/1) clay films on surfaces of peds; few distinct gray (10YR 6/1) slickensides; 10 percent crawfish krotovinas filled with brown (10YR 5/3) and pale brown (10YR 6/3) very fine sand; few fine threads of barite crystals; 15 percent medium and coarse prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 10 percent medium and coarse prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries along roots and pores; very strongly acid; gradual smooth boundary.

Btg/Eg4—72 to 80 inches; 45 percent gray (10YR 6/1) (Btg) clay loam; 20 percent light gray (10YR 7/1) (Eg); weak coarse prismatic structure parting to moderate medium subangular blocky; very hard, very firm; common fine roots; common very fine tubular pores; few distinct gray (10YR 6/1) clay films on surfaces of peds; few distinct gray (10YR 6/1) slickensides; 10 percent crawfish krotovinas filled with pale brown (10YR 6/3) very fine sand and gray (10YR 6/1) silt loam; few fine threads of barite crystals; 12 percent fine prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; 12 percent fine and coarse prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries; 10 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries along roots; extremely acid.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is to 20 to 35 percent. The percent of sands larger than very fine sand is 5 to 15 percent. Depth to threads and masses of barite ranges from 45 to 60 inches. Aluminum saturation ranges from 50 to 80 percent throughout. Reaction is extremely acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3. Texture is very fine sandy loam or silt loam. Crawfish bioturbation ranges from 10 to 40 percent. Iron concentrations in shades of yellow or brown range from 2 to 10 percent. Exchangeable sodium percentage ranges from 2 to 5.

The Bg horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2. Texture is very fine sandy loam, silt loam, or loam. Crawfish bioturbation ranges from 50 to 80 percent. Iron concentrations in shades of red, yellow, or brown range from 10 to 25 percent. Exchangeable sodium percentage ranges from 3 to 10.

The Btg part of the Btg/Eg horizon has hue of 10YR to 5Y, value of 6 or 7, and chroma of 1 or 2. The Eg part has hue of 10YR, or 2.5Y, value of 6 to 8, and chroma of 1 or 2. Texture is silt loam, loam, or clay loam. Crawfish bioturbation ranges from 10 to 50 percent and the amount reduces with depth. Iron concentrations in shades of red, yellow, or brown range from 15 to 35 percent. Iron depletions in shades of gray, blue, or green ranges from 5 to 10 percent. Exchangeable sodium percentage ranges from 6 to 11.

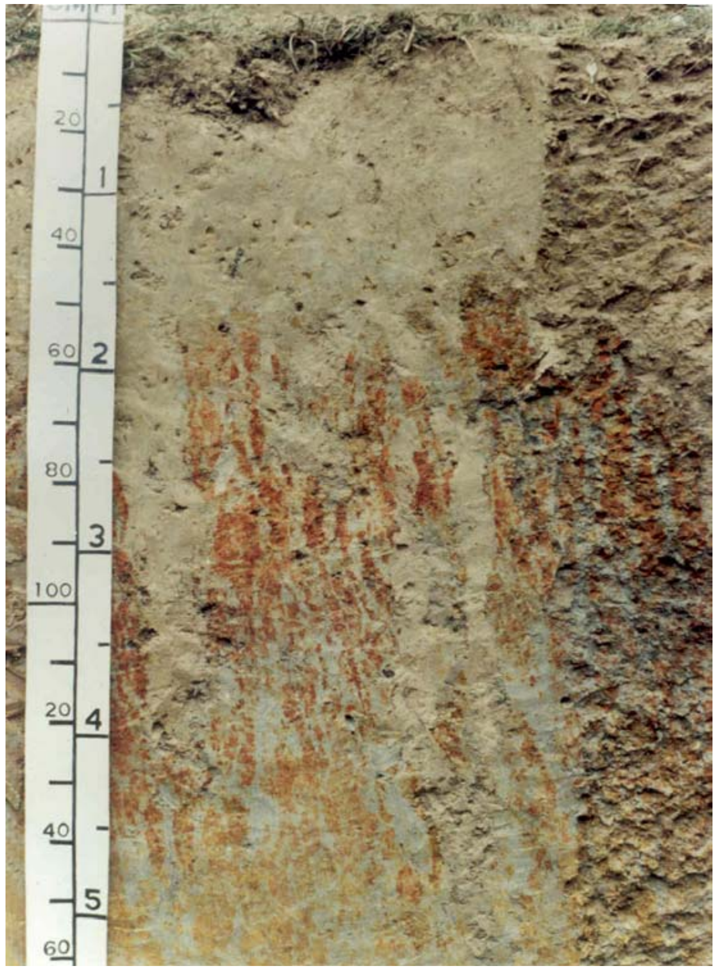


Figure 21.—Profile of Nona very fine sandy loam in an area of Nona-Dallardsville complex, 0 to 1 percent slopes.

Olive Series

The Olive series consists of very deep, very poorly drained, very slowly permeable soils. These soils formed in sandy and loamy sediments on nearly level flat coastal plains of mid to late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Olive series are coarse-loamy, siliceous, superactive, thermic Umbric Fragiaquults

Typical pedon of Olive silt loam, 0 to 1 percent slopes; from the intersection of U.S. Highway 69 and Farm Road 418 in Kountze; 10.5 miles north on U.S. Highway 69; 6.4 miles west on Gore Store Road; 0.2 mile south on forest road; 60 feet west in forest; USGS Hicksbaugh topographic quadrangle; lat. 30 degrees 30 minutes 52.5 seconds N. and lat. 94 degrees 17 minutes 53.0 seconds W.

A1—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine and medium granular structure; slightly hard, friable; many very fine to coarse roots; many medium and coarse pores; few crayfish krotovinas and tubules; 15 percent fine distinct light brownish gray (10YR 6/2) iron depletions with clear boundaries on interiors of peds; ultra acid; abrupt smooth boundary.

A2—6 to 14 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; many fine and medium roots; many fine and medium pores; few crayfish krotovinas and tubules; 1 percent fine faint dark yellowish brown (10YR 4/4) iron concentrations with clear boundaries on surfaces of peds; 1 percent faint grayish brown (2.5Y 5/2) iron depletions with clear boundaries on horizontal surfaces of peds; ultra acid; clear smooth boundary.

Eg—14 to 22 inches; light gray (10YR 7/2) silt loam; moderate medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm; many very fine and fine roots between prisms; many very fine and fine pores; 1 percent crayfish krotovinas filled with very pale brown (10YR 8/2) very fine sandy loam; 30 percent medium grayish brown (10YR 5/2) organic stains on surfaces of peds; few fine prominent brown (7.5YR 4/4) iron concentrations with clear boundaries on surfaces of peds; 1 percent fine distinct grayish brown (2.5Y 5/2) iron depletions on horizontal surfaces of peds; 5 percent brittle material 1 to 2 inches wide with nonbrittle material in between; ultra acid; clear wavy boundary.

Exg1—22 to 42 inches; light gray (10YR 7/2) fine sandy loam; moderate medium and coarse prismatic structure parting to weak coarse and very coarse subangular blocky; very hard, very firm; common very fine and fine roots between prisms; common fine, medium, and few coarse pores; 1 percent crayfish krotovinas filled with very pale brown (10YR 8/2) very fine sandy loam; 2 percent fine prominent brown (7.5YR 4/4) iron concentrations with clear and diffuse boundaries on surfaces of peds and in pores; 2 percent fine distinct pinkish gray (7.5YR 7/2) iron depletions with diffuse boundaries on surfaces of prisms; 60 percent brittle material 3 to 14 inches wide with nonbrittle material in between; extremely acid; gradual wavy boundary.

Exg2—42 to 65 inches; light gray (10YR 7/2) fine sandy loam; moderate very coarse prismatic structure parting to weak very coarse subangular blocky; extremely hard, extremely firm; common very fine and fine roots between prisms; common fine, medium, and coarse pores; 2 percent crayfish krotovinas filled with very pale brown (10YR 8/2) very fine sandy loam; 2 percent medium prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries on surfaces of prisms; 1 percent faint pinkish gray (7.5YR 7/2) iron depletions with diffuse boundaries on surfaces of prisms; 75 percent brittle material with nonbrittle material 1 to 2 inches wide in vertical seams between prisms; extremely acid; gradual wavy boundary.

Exg/Btxg1—65 to 78 inches; 80 percent light gray (2.5Y 7/2) (Exg) fine sandy loam; 15 percent light brownish gray (10YR 6/2) (Btxg); moderate very coarse prismatic structure parting to weak very coarse subangular blocky; extremely hard, extremely firm; very few very fine roots between prisms; many fine and medium, and common coarse pores; 2 percent faint light gray (10YR 7/2) clay films along surfaces of prisms in Btxg; 1 percent crayfish krotovinas filled with very pale brown (10YR 8/2) very fine sandy loam; 2 percent fine and medium prominent olive yellow (2.5Y 6/6) and brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries on interiors of peds in the Btxg part; 2 percent fine and medium faint pinkish gray (7.5YR 7/2) iron depletions on surfaces of prisms; 80 percent brittle material with nonbrittle material 1/4 to 1/2 inch wide in vertical seams between prisms; extremely acid; gradual wavy boundary.

Exg/Btxg2—78 to 80 inches; 65 percent light gray (2.5Y 7/2) (Exg) fine sandy loam; 15 percent light brownish gray (10YR 7/2) (Btxg); moderate very coarse prismatic structure parting to weak very coarse subangular blocky; extremely hard, extremely firm; very few very fine roots between peds; many medium and common coarse pores; 2 percent faint light gray (10YR 7/2) clay films along surfaces of prisms in the Btxg part; 1 percent crayfish krotovinas filled with white (10YR 8/1) very fine sandy loam; 15 percent fine prominent olive yellow (2.5Y 6/6) iron concentrations with diffuse boundaries on surfaces of peds; 2 percent medium prominent strong brown

(7.5YR 5/6) iron concentrations with diffuse boundaries on interiors of peds in Btxg; 1 percent fine and medium distinct pinkish gray (7.5YR 7/2) iron depletions on surfaces of prisms; 90 percent brittle material with nonbrittle material that is 1/4 to 1/2 inch wide in vertical seams between prisms; extremely acid.

Solum thickness is 20 to 36 inches thick to a fragipan. Depth to argillic material is 30 to 60 inches from the surface. Weighted average clay content of the particle-size control section ranges from 3 to 12 percent. Base saturation ranges from 5 to 20 percent throughout.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The texture is fine sandy loam or silt loam. Iron concentrations are few to common in shades of yellow and brown. Iron depletions are few to common in shades of gray. Reaction is ultra acid or extremely acid.

The Eg horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. The texture is fine sandy loam or silt loam. Iron concentrations are few to common in shades of yellow and brown. Iron depletions are few to common in shades of gray. The horizon is up to 40 percent brittle in the lower part. Reaction is ultra acid or extremely acid.

The Exg horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 or 2. The texture is fine sandy loam or silt loam. Iron concentrations are few to common in shades of yellow and brown. Iron depletions are few to common in shades of gray. The horizon is 60 to 90 percent brittle. Reaction is extremely acid or very strongly acid.

The Exg part of the Exg/Btxg horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 or 2. The texture is fine sandy loam or silt loam. The Btxg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Iron concentrations are few to common in shades of yellow or brown. Iron depletions are few to common in shades of gray. The horizon is 70 to 90 percent brittle. Reaction is extremely acid or very strongly acid.

Otanya Series

The Otanya series consists of very deep, well drained, moderately slowly permeable soils that formed in loamy coastal plain sediments of early to mid Pleistocene age. These nearly level to gently sloping soils are on backslopes on inland dissected coastal plains. Slope ranges from 1 to 5 percent. Soils of the Otanya series fine-loamy, siliceous, semiactive, thermic Plinthic Paleudults

Typical pedon of Otanya fine sandy loam (fig. 22), 1 to 5 percent slopes; from the intersection of Texas Highway 327 and U.S. Highway 96 Bypass; 1,000 feet west in pit; USGS Silsbee topographic quadrangle; lat. 30 degrees 20 minutes 33.2 seconds N. and lat. 94 degrees 09 minutes 10.8 seconds W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2), fine sandy loam; moderate fine subangular blocky structure parting to moderate fine granular; slightly hard, friable; many very fine to coarse roots; many very fine to medium interstitial pores; extremely acid; clear smooth boundary.

E—5 to 23 inches; brown (10YR 5/3), fine sandy loam; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common very fine to coarse roots; common very fine to medium interstitial and tubular pores; very strongly acid; clear smooth boundary.

Bt1—23 to 34 inches; yellowish brown (10YR 5/8), sandy clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine and fine roots; common very fine and fine tubular pores; few distinct yellowish brown (10YR 5/6) clay films on surfaces of peds; common fine ironstone nodules; 2 percent fine and medium distinct strong brown (7.5YR 5/6) iron concentrations with sharp boundaries; extremely acid; gradual smooth boundary.

Bt2—34 to 44 inches; yellowish brown (10YR 5/8), sandy clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; hard, firm; common very fine and fine roots between peds; common very fine and fine tubular pores; few distinct yellowish brown (10YR 5/6) clay films on surfaces of peds; common fine ironstone nodules; 2 percent fine and medium distinct strong brown (7.5YR 5/6) iron concentrations with sharp boundaries; extremely acid; gradual smooth boundary.

Btv1—44 to 55 inches; brownish yellow (10YR 6/8), sandy clay loam; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine and fine roots; common very fine and fine tubular pores; few prominent strong brown (7.5YR 5/8) clay films on surfaces of peds; common fine ironstone nodules; 7 percent fine and medium red (10R 4/8) plinthite segregations; 5 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 2 percent fine and medium distinct strong brown (7.5YR 5/6) iron concentrations with sharp boundaries; 1 percent fine prominent gray (10YR 6/1) iron depletions with sharp boundaries along roots; extremely acid; gradual smooth boundary.

Btv2—55 to 74 inches; brownish yellow (10YR 6/8) sandy clay loam; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine and fine roots between peds; common very fine and fine tubular pores and common medium tubular pores; few prominent strong brown (7.5YR 5/8) clay films on surfaces of peds; few fine ironstone nodules; 6 percent red (10R 4/8) plinthite segregations; 5 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 2 percent fine and medium distinct strong brown (7.5YR 5/6) iron concentrations with clear boundaries; 2 percent fine prominent gray (10YR 6/1) with sharp boundaries along roots; extremely acid; gradual smooth boundary.

Btv/E—74 to 80 inches; 70 percent brownish yellow (10YR 6/8) (Btv) sandy clay loam, and 20 percent light gray (10YR 7/1) (E); moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; few very fine and fine roots; few fine and medium tubular pores; very few distinct strong brown (7.5YR 5/8) clay films on surfaces of peds; 7 percent medium red (10R 4/8) plinthite segregations; 5 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 2 percent fine and medium distinct strong brown (7.5YR 5/6) iron concentrations with clear boundaries; 2 percent gray (10YR 6/1) with sharp boundaries along roots; the E part consists of tongues of albic material 1/4 to 3/4 inch wide between surfaces of peds; extremely acid.

Solum thickness is more than 80 inches. Base saturation ranges from 15 to 30 percent. Average clay content ranges from 20 to 30 percent in the particle-size control section. Reaction is extremely acid to very strongly acid throughout.

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

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. Texture is very fine sandy loam or fine sandy loam. Ironstone nodules range from 0 to 5 percent.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is sandy clay loam or clay loam. Ironstone nodules range from 0 to 5 percent. Iron concentrations in shades of red, yellow, or brown range from 0 to 10 percent.

The Btv horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is sandy clay loam or clay loam. Plinthite segregations range from 5 to 15 percent. Iron concentrations in shades of red, yellow, or brown range from 2 to 15 percent. Ironstone nodules range from 1 to 10 percent.

The Btv part of the Btv/E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The E part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is loam or sandy clay loam. Ironstone nodules range from 0 to 8 percent. Plinthite segregations range from 5 to 10 percent. Iron concentrations in shades of red, yellow, or brown range from 2 to 15 percent. Iron depletions in shades of gray range from 1 to 5 percent.

Figure 22.—Profile of Otanya fine sandy loam, 1 to 3 percent slopes.

Plank Series

The Plank series consists of very deep, poorly drained, slowly permeable soils. These soils formed in loamy sediments on nearly level flat coastal plains of early to mid Pleistocene age. Slopes are 0 to 1 percent. Soils of the Plank series are coarse-silty, siliceous, active, thermic Natric Vermaqualfs

Typical pedon of Plank silt loam (fig. 23), 0 to 1 percent slopes; from the intersection of U.S. Highway 69 and Farm Road 326 in Kountze; 7.3 miles north on U.S. Highway 69; 200 feet east in pine plantation; USGS Village Mills topographic quadrangle; lat. 30 degrees 27 minutes 02.0 seconds N. and lat. 94 degrees 23 minutes 04.0 seconds W.

A—0 to 3 inches; grayish brown (10YR 5/2) silt loam; 95 percent massive because of crayfish bioturbation, and 5 percent undisturbed with weak medium subangular blocky structure; hard, firm; many very fine to medium, and common coarse roots; 95 percent of the horizon is crayfish tubules and krotovinas; krotovinas are filled with a mixture of grayish brown (10YR 5/2) silt loam and pinkish gray (7.5YR 7/2) very fine sand; few faint very dark gray (10YR 3/1) organic coats on surfaces of peds; many fine cylindrical and common fine rounded grayish brown (10YR 5/2) hard wormcasts; many pieces of charcoal 1/4 to 1 inch wide; 3 percent streaks and masses of pinkish gray (7.5YR 7/2) very fine sand albic material on vertical surfaces of peds; extremely acid; clear wavy boundary

Bg1—3 to 24 inches; light brownish gray (10YR 6/2) silt loam; 95 percent massive because of crayfish bioturbation, and 5 percent undisturbed with weak coarse subangular blocky structure; hard, firm; many very fine to medium, and common coarse roots; many very fine to medium, and common coarse pores; 95 percent by volume of this horizon is crayfish tubules and krotovinas; krotovinas are filled with light brownish gray (10YR 6/2) and grayish brown (10YR 5/2) silt loam, and pink (7.5YR 7/3) and pinkish gray (7.5YR 7/2) very fine sand; few tubules and krotovinas are lined with grayish brown (10YR 5/2) silty clay loam; common fine cylindrical and few fine rounded grayish brown (10YR 5/2) hard wormcasts; very few patchy very dark gray (10YR 3/1) organic coats on surfaces of peds, root channels, and in pores; many pieces of charcoal 1/4 to 1 inch wide; 2 percent fine prominent yellowish red (5YR 5/8), 2 percent fine and medium prominent brown (7.5YR 5/4), 5 percent fine prominent strong brown (7.5YR 5/6), and 5 percent fine and medium distinct yellow (10YR 7/6) iron concentrations with diffuse boundaries on surfaces of peds; 2 percent fine and medium prominent brown (7.5YR 5/4), and dark brown (7.5YR 4/4); and 2 percent fine prominent yellowish red (5YR 5/6) and light red (2.5YR 6/6) iron concentrations with sharp boundaries lining root channels and pores; 2 percent of the horizon is streaks and pockets of pink (7.5YR 7/3) and pinkish gray (7.5YR 7/2) very fine sand albic material on vertical surfaces of peds; extremely acid; gradual wavy boundary.

Bg2—24 to 35 inches; light gray (10YR 7/2) silt loam; 70 percent massive because of crayfish bioturbation, and 30 percent undisturbed with weak very coarse prismatic structure; very hard, very firm; common fine roots between peds in nonbrittle material; many fine and medium, and common coarse pores; 70 percent of this horizon is crayfish tubules and krotovinas; krotovinas filled with grayish brown (10YR 5/2) silt loam, and pink (7.5YR 7/3), pinkish gray (7.5YR 7/2), light brown (7.5YR 6/3) very fine sand; few tubules and krotovinas are lined with very dark gray (10YR 3/1) and grayish brown (10YR 5/2) silty clay loam; 4 percent fine and medium prominent light red (2.5YR 7/6), 7 percent fine prominent reddish yellow (7.5YR 6/8), 3 percent fine and medium prominent brown (7.5YR 5/4), and 5 percent fine and medium distinct yellow (10YR 7/6), and brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries on surfaces of peds; 2 percent fine prominent brown (7.5YR 5/4), and yellowish red (5YR 4/6) iron concentrations with sharp boundaries lining root channels and pores; 5 percent of the horizon is streaks and pockets of pink (7.5YR 7/3) and pinkish gray (7.5YR 7/2) very fine sand albic material on vertical surfaces of prisms; few pieces of charcoal 1/4 to 1 inch in diameter; 22 percent is brittle material that is 2 to 6 inches wide with nonbrittle material in between; extremely acid; gradual wavy boundary.

Btg1—35 to 64 inches; light brownish gray (10YR 6/2) silt loam; 50 percent massive because of bioturbation, and 50 percent undisturbed with weak very coarse prismatic structure; very hard, very firm; very few very fine, many fine and medium, and common coarse pores; common faint continuous grayish brown (10YR 5/2) clay films lining pores and on prism surfaces of undisturbed material; 50 percent of this horizon is crayfish krotovinas; krotovinas are filled with grayish brown (10YR 5/2), light gray (10YR 7/2), and light brownish gray (10YR 6/2) silt loam, and pink (7.5YR 7/3), pinkish gray (7.5YR 7/2) and pale brown (10YR 6/3) very fine sand; 3 percent fine and medium distinct brown (7.5YR 5/2) organic coats on surfaces of peds; 8 percent fine and medium distinct brownish yellow (10YR 6/6), 20 percent fine and medium prominent strong brown (7.5YR 5/8), and 5 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with diffuse boundaries, 2 percent fine prominent brown (7.5YR 5/4) and yellowish red (5YR 4/6) iron concentrations with sharp boundaries lining root channels and pores; 5 percent fine faint light brownish gray (10YR 6/2) iron depletions with diffuse boundaries; 5 percent is streaks and pockets of pink (7.5YR 7/3) very fine sand albic material with pinkish gray (7.5YR 7/2) and pinkish white (7.5YR 8/2) clay depletions in the interior; 26 percent is brittle material that is 2 to 8 inches wide with nonbrittle material in between; extremely acid; gradual wavy boundary.

Btg2—64 to 80 inches; light brownish gray (10YR 6/2) silt loam; weak very coarse prismatic structure; very hard, very firm; common fine to coarse vesicular pores; common distinct grayish brown (10YR 5/2) clay films on pore linings and on surfaces of prisms; 30 percent of this horizon is crayfish krotovinas; krotovinas are filled with light brownish gray (10YR 6/2), light gray (10YR 7/2), and grayish brown (10YR 5/2) silt loam, and pink (7.5YR 7/3), pinkish gray (7.5YR 7/2), and pale brown (10YR 6/3) very fine sand; 15 percent fine and medium distinct brownish yellow (10YR 6/6), 8 percent fine prominent strong brown (7.5YR 5/8), 5 percent fine prominent yellow (2.5Y 7/6), and 2 percent fine prominent light olive brown (2.5Y 5/3) iron concentrations with diffuse boundaries; 5 percent fine and medium distinct pinkish gray (7.5YR 5/2), and 5 percent fine faint grayish brown (10YR 5/2) iron depletions with diffuse boundaries; 5 percent is streaks and pockets of pink (7.5YR 7/3) very fine sand albic material with pinkish gray (7.5YR 7/2) and pinkish white (7.5YR 8/2) clay depletions in the interior; 36 percent is brittle material that is 4 to 10 inches wide with nonbrittle material in between; extremely acid; gradual wavy boundary.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 10 to 15 percent, and the silt plus very fine sand is 70 to 90 percent. Aluminum saturation ranges from 60 to 90 percent.

The A horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 1 or 2. Texture is very fine sandy loam or silt loam. Iron concentrations in shades of brown range from 0 to 8 percent. Albic material ranges from 0 to 5 percent. Bioturbation in the form of crayfish krotovinas and tubules ranges from 50 to 95 percent.

The Bg horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2. Texture is very fine sandy loam, loam, or silt loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 35 percent. Albic material ranges from 0 to 5 percent. Bioturbation in the form of crayfish krotovinas and tubules ranges from 50 to 95 percent. Brittle material ranges from 0 to 25 percent and weakly or moderately cemented. Reaction is extremely acid or very strongly acid.

The Btg horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is silt loam or loam. Iron concentrations in shades of red, yellow, or brown range from 10 to 35 percent. Iron depletions in shades of gray range from 1 to 15 percent. Albic material ranges from 0 to 15 percent. Bioturbation in the form of crayfish krotovinas and tubules range from 30 to 75 percent. Brittle material ranges from 25 to 50 and weakly or moderately cemented. Reaction is extremely acid or very strongly acid. Barite threads and masses and few hard pitted calcium carbonate concretions range from 0 to 10 percent. Exchangeable sodium percentage ranges from 10 to 25.

Figure 23.—Profile of Plank silt loam, 0 to 1 percent slopes.

Silsbee Series

The Silsbee series consists of very deep, well drained, moderately permeable soils. These soils formed in loamy sediments on gently sloping to strongly sloping backslopes on inland dissected coastal plains of early to mid Pleistocene age. Slope ranges from 3 to 12 percent. Soils of the Silsbee series are fine-loamy, siliceous, semiactive, thermic Typic Paleudults

Typical pedon of Silsbee fine sandy loam (fig. 24), 3 to 12 percent slopes; from the intersection of Farm Road 418 and Farm Road 1122 in Silsbee; 0.4 mile northwest on Farm Road 418 to county road; 0.1 mile north and 1.9 mile northwest on county road to forest road; 0.7 mile west on forest road; 75 feet north in forest; USGS Deserter Baygall topographic quadrangle; lat. 30 degrees 25 minutes 26.0 seconds N. and lat. 94 degrees 14 minutes 34.0 seconds W.

A—0 to 5 inches; brown (10YR 5/3) fine sandy loam; moderate medium granular structure; soft, friable; many very fine to coarse roots; many fine and medium pores; very strongly acid; clear smooth boundary

E—5 to 15 inches; 80 percent light yellowish brown (10YR 6/4) and 20 percent pale brown (10YR 6/3) fine sandy loam; moderate medium subangular blocky structure; slightly hard, friable; many very fine to medium and common coarse roots; many fine and common medium pores; very strongly acid; clear smooth boundary.

Bt1—15 to 30 inches; yellowish red (5YR 5/8) sandy clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; many fine and medium roots; common very fine and fine pores; 5 percent distinct yellowish red (5YR 4/6) clay films on surfaces of peds; 3 percent ironstone nodules; strongly acid; gradual smooth boundary.

Bt2—30 to 49 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine and fine roots; common very fine and fine pores; 4 percent faint yellowish red (5YR 4/6) and (5YR 5/8) clay films on surfaces of peds; 3 percent fine rounded ironstone nodules; strongly acid; gradual wavy boundary.

Bt3—49 to 58 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm; common fine and medium roots; common very fine pores; 2 percent prominent yellowish red (5YR 4/6) clay films and 2 percent distinct yellowish red (5YR 5/8) clay films on surfaces of peds; 2 percent fine rounded ironstone concretions; 1 percent fine rounded red (2.5YR 4/6) plinthite; 2 percent fine prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; strongly acid; gradual wavy boundary.

Bt4—58 to 71 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine and fine roots; common very fine pores; 5 percent prominent yellowish red (5YR 4/6) clay films and 1 percent distinct yellowish red (5YR 5/8) clay films on surfaces of peds; 3 percent fine red (2.5YR 4/6) plinthite; 2 percent fine prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; strongly acid; gradual wavy boundary.

Bt5—71 to 80 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine roots; common fine and medium pores; 2 percent distinct strong brown (7.5YR 5/6) clay films on surfaces of peds; 3 percent fine plinthite; 2 percent fine prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; strongly acid.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 18 to 30 percent. Base saturation ranges from 25 to 35 percent. Reaction ranges from extremely acid to strongly acid throughout.

The A horizon has hue 10YR, value of 4 to 6, and chroma of 3 or 4. Texture is very fine sandy loam or fine sandy loam

The E horizon has hue 10YR, value of 5 to 7, and chroma of 3 or 4. Texture is very fine sandy loam or fine sandy loam

The upper Bt horizon has hue 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8. Texture is loam, sandy clay loam, or clay loam.

The lower Bt horizon has hue of 5YR or 7.5YR, value of 5 to 7, and chroma of 6 to 8. Texture is fine sandy loam, loam, or sandy clay loam. Iron concentrations are few to many in shades of red, yellow, or brown. Plinthite ranges from 1 to 4 percent.

Figure 24.—Profile of Silsbee fine sandy loam, 5 to 12 percent slopes.

Sorter Series

The Sorter series consists of very deep, poorly drained, slowly permeable soils. These soils formed in loamy coastal plains sediments on nearly level broad flat coastal plains of early to mid Pleistocene age. Slopes are 0 to 1 percent. The soils of the Sorter series are coarse-loamy, siliceous, superactive, thermic Natric Vermaqualfs

Typical pedon of Sorter very fine sandy loam (fig. 25) in an area of Sorter-Dallardsville complex, 0 to 1 percent slopes; from the intersection of Farm Road 1003 and Farm Road 1293 in Honey Island; 3.7 miles west on Farm Road 1293 to county road; 0.3 mile north on county road, and 0.1 mile west on county road, then 0.65 mile north on county road to forest road; 0.2 mile west on forest road; 40 feet north of road in clear cut; USGS Bragg topographic quadrangle; lat. 30 degrees 25 minutes 10.0 seconds N. and lat. 94 degrees 30 minutes 13.0 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very fine sandy loam; moderate fine and medium granular structure; hard, friable; many fine and medium and common coarse roots; many fine and medium pores; 10 percent crawfish tubules and krotovinas filled with a mixture of grayish brown (10YR 5/2) silt loam, pink (7.5YR 8/3) fine sand, and light gray (10YR 7/2) very fine sandy loam; 3 percent fine faint brown (10YR 4/3) iron concentrations with clear boundaries on surfaces of peds and in pores; extremely acid; abrupt smooth boundary.

Bg1—3 to 24 inches; gray (10YR 5/1) very fine sandy loam; 80 percent massive because of crawfish bioturbation, and 20 percent, undisturbed with weak coarse prismatic structure; hard, firm; few very fine roots; common fine and medium pores; 80 percent of the horizon is crawfish tubules and krotovinas filled with a mixture of grayish brown (10YR 5/2) silt loam, pink (7.5YR 8/3) fine sand, and cupped with very dark gray (10YR 3/1) clay at the bottom of the tubule; 7 percent fine prominent yellowish red (5YR 4/6) iron concentrations with sharp boundaries lining root channels and pores; 2 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries on surfaces of peds and in pores; 8 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with diffuse boundaries; 5 percent pink (7.5YR 7/3) very fine sandy loam albic material on surfaces of peds; 5 percent of the horizon is brittle; very strongly acid; diffuse wavy boundary.

Bg2—24 to 41 inches; gray (10YR 6/1) very fine sandy loam; 75 percent massive because of crawfish bioturbation, and 25 undisturbed, with weak coarse prismatic structure; hard, firm; few very fine roots; common fine and medium pores; 75 percent of the horizon is crawfish tubules and krotovinas filled with a mixture of grayish brown (10YR 5/2), light brownish gray (10YR 6/2) silt loam, pink (7.5YR 8/3) fine sand, and cupped with very dark gray (10YR 3/1) clay at the bottom of the tubule; 12 percent medium and coarse prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries on surfaces of peds; 8 percent fine and medium prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries on surfaces of peds and pores; 1 percent fine prominent pale green (5G 6/2) iron depletions with sharp boundaries in pores and lining krotovinas; 5 percent pink (7.5YR 7/3) very fine sandy loam albic material; 5 percent of the horizon is brittle; very strongly acid; diffuse wavy boundary.

Btg/E1—41 to 51 inches; 60 percent light gray (10YR 7/2) (Btg) very fine sandy loam; 15 percent pink (7.5YR 7/3) (E) very fine sandy loam; 50 percent massive because of crawfish bioturbation, and 50 percent undisturbed, with moderate coarse prismatic structure; hard, firm; few very fine roots; common fine and medium pores; 50 percent of the horizon is crawfish krotovinas filled with a mixture of grayish brown (10YR 5/2) silt loam, pink (7.5YR 8/3) very fine sandy loam, and cupped with very dark gray (10YR 3/1) clay at the bottom of the tubule; 7 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries on surfaces of peds; 20 percent medium and coarse prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries on surfaces of peds; 10 percent of the horizon is brittle; very strongly acid; diffuse wavy boundary.

Btg/E2—51 to 78 inches; 55 percent light gray (10YR 7/2) (Btg) very fine sandy loam; 15 percent pink (7.5YR 7/3) (E); 45 percent massive because of crawfish bioturbation, and 55 percent undisturbed with moderate medium and coarse prismatic structure; hard, firm; few very fine roots in krotovinas; common fine and medium pores; 45 percent of the horizon is crawfish krotovinas filled with a mixture of light brownish gray (10YR 6/2), pinkish gray (7.5YR 7/2) silt loam, and pink (7.5YR 8/3) very fine sandy loam, and cupped with very dark gray (10YR 3/1) clay at the bottom of the tubule; 20 percent fine to coarse prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries; 2 percent fine and medium reddish yellow (7.5YR 7/6) iron concentrations with clear boundaries on surfaces of peds; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries lining roots and pores; 2 percent fine prominent light greenish gray (10Y 7/1) iron depletions lining old root channels; 20 percent the horizon is brittle; very strongly acid; diffuse wavy boundary.

Exg/Btxg—78 to 80 inches; 65 percent pinkish gray (7.5YR 7/2) (Exg) very fine sandy loam; 20 percent light gray (10YR 7/2) (Btxg) very fine sandy loam; weak coarse prismatic structure; very hard, very firm; very few very fine roots between prisms and in krotovinas; common fine and medium pores; 25 percent of the horizon is crawfish krotovinas filled with light brownish gray (10YR 6/2), pinkish gray (7.5YR 7/2) silt loam, and pink (7.5YR 8/3), pinkish white (7.5YR 8/2) very fine sandy loam, and cupped with very dark gray (10YR 3/1) clay at the bottom of the tubule; 15 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries on vertical prism surfaces in the Btg; 60 percent of the horizon is brittle; strongly acid.

Solum thickness is more than 80 inches. The weighted average clay content in the particle-size control section is 4 to 9 percent. Exchangeable sodium percentage ranges from 10 to 15 percent.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. Texture is very fine sandy loam or silt loam. Crawfish bioturbation ranges from 5 to 25 percent. Iron concentrations in shades of yellow and brown range from 1 to 8 percent. Reaction is extremely acid or very strongly acid.

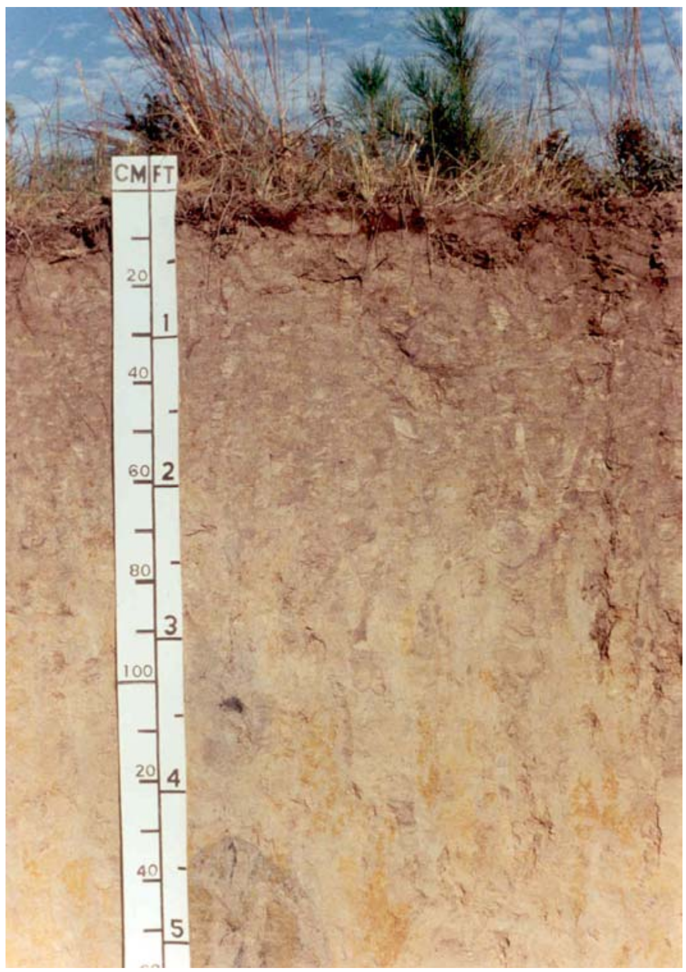


Figure 25.—Profile of Sorter in an area of Sorter-Dallardsville complex, 0 to 1 percent slopes.

The Bg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Texture is very fine sandy loam or silt loam. Crawfish bioturbation ranges from 50 to 90 percent. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Iron depletions in shades of gray, green, or blue range from 1 to 5 percent. Reaction is extremely acid or very strongly acid.

The Btg part of the Btg/E horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. The E part has hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 1 to 3. Texture is very fine sandy loam, silt loam, or loam. Crawfish bioturbation ranges from 40 to 60 percent. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent. Iron depletions in shades of gray, green, or blue range from 1 to 8 percent. Reaction ranges from very strongly acid to moderately acid.

The Exg part of the Exg/Btxg horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 1 or 2. The Btxg part has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2. Texture is loam, very fine sandy loam, or silt loam. Crawfish bioturbation ranges from 10 to 45 percent. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent. Iron depletions in shades of gray, green, or blue range from 1 to 8 percent. Reaction ranges from very strongly acid to slightly acid.

Spindletop Series

The Spindletop series consists of very deep, moderately well drained, very slowly permeable soils. These soils formed in loamy and clayey sediments on nearly level flat coastal plains of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Spindletop series are fine, smectitic, hyperthermic Oxyaquic Argiudolls

Typical pedon of Spindletop silt loam in an area of Labelle-Spindletop complex, 0 to 1 percent slopes; from the intersection of Texas Highway 105 and Farm Road 770 in Batson; 1.7 miles south on Farm Road 770 to Cemetery Road; 1.2 miles south on Cemetery Road to county road; 0.6 mile east, then 2.4 miles south on county road to private road; 2.0 miles south on private road; 100 feet east on mound in pasture; USGS Thorson Gully topographic quadrangle; lat. 30 degrees 09 minutes 42.3 seconds N. and lat. 94 degrees 33 minutes 03.4 seconds W.

A—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine and medium granular structure; slightly hard, friable; many very fine and fine, and common medium roots; many fine and medium interstitial and tubular pores; 2 percent fine prominent reddish brown (5YR 4/3) iron concentrations with sharp boundaries along roots and pores; strongly acid; clear smooth boundary.

E—10 to 21 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine and medium subangular blocky structure; slightly hard, friable; many very fine and fine, and common medium roots; many fine and medium interstitial and tubular pores; few gray (10YR 5/1) clean sand grains along roots; strongly acid; gradual smooth boundary.

Bt—21 to 26 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; common very fine to fine medium roots; common fine tubular pores; few distinct dark grayish brown (10YR 4/2) clay films on surfaces of peds; 1 percent fine faint very dark brown (10YR 2/2) iron-manganese concretions; 4 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 2 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries; 10 percent streaks and pockets of grayish brown (10YR 5/2) albic material on vertical faces of peds; slightly acid; gradual wavy boundary.

Btg1—26 to 34 inches; gray (10YR 5/1) clay; moderate medium prismatic and moderate medium angular blocky structure; extremely hard, extremely firm; common very fine and fine roots; common fine tubular pores; few distinct dark gray (10YR 4/1) clay films on surfaces of peds; few distinct pressure faces; 1 percent fine very dark brown (7.5YR 2/2) iron-manganese concretions; 6 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 8 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; slightly acid; gradual wavy boundary.

Btg2—34 to 46 inches; gray (10YR 5/1) silty clay; weak medium and coarse prismatic structure parting to moderate medium subangular blocky; extremely hard, extremely firm; common very fine roots; common fine tubular pores; very few faint gray (10YR 5/1) clay films on surfaces of peds; few distinct pressure faces; few distinct intersecting slickensides; 1 percent fine very dark brown (10YR 2/2) iron-manganese concretions; 10 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; 15 percent fine and medium prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; slightly acid; gradual wavy boundary.

Btg3—46 to 57 inches; gray (10YR 6/1) silty clay; weak medium and coarse prismatic and moderate medium subangular blocky structure; extremely hard, extremely firm; common very fine roots; very few faint gray (10YR 5/1) clay films on surfaces of peds; few distinct pressure faces; few distinct intersecting slickensides; 3 percent fine very dark brown (7.5YR 2/2) iron-manganese concretions; 20 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; slightly acid; gradual wavy boundary.

Bssg—57 to 80 inches; gray (10YR 6/1) silty clay; weak medium and coarse prismatic structure parting to moderate medium subangular blocky; extremely hard, extremely firm; common very fine roots; common distinct pressure faces; common distinct intersecting slickensides; few fine concretions of calcium carbonate; 20 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with clear boundaries; 10 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with sharp boundaries; neutral.

Solum thickness is more than 80 inches. Average clay content of the particle-size control section is 35 to 45 percent. Combined depth of the A and E horizons is 15 to 25 inches. Base saturation is 75 to 95 percent. These soils remain saturated at a depth of 21 to 34 inches from December to March in most years.

The A horizon has hue of 10YR, value of 3, and chroma of 2 or 3. Iron concentrations in shades of brown range from 0 to 4 percent. Reaction is strongly acid or moderately acid. Some pedons have color value of 4.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. Iron concentrations in shades of yellow or brown range from 1 to 8 percent. Reaction ranges from strongly acid to slightly acid.

The Bt horizon has hue of 10YR, value of 4 to 6, and chroma of 2. Texture is silt loam or silty clay loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Some pedons have iron depletions in shades of gray. Albic material ranges from 0 to 10 percent. Reaction is strongly acid or moderately acid.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations in shades of red, yellow, or brown range from 8 to 30 percent. Reaction is slightly acid to neutral.

The Bssg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1. Texture is silty clay or clay. Concretions of hard-pitted calcium carbonate ranges from 0 to 5 percent. Iron concentrations in shades of red, yellow, or brown range from 8 to 30 percent. Some pedons have iron depletions in shades of gray. Reaction ranges from slightly acid to slightly alkaline.

Spurger Series

The Spurger series consists of very deep, moderately well drained, slowly permeable soils on terraces. These nearly level and very gently sloping soils formed in clayey and sandy alluvium of late Pleistocene age. Slope ranges from 0 to 2 percent. Soils of the Spurger series are fine, smectitic, thermic Albaquultic Hapludalfs

Typical pedon of Spurger very fine sandy loam, 0 to 2 percent slopes; from the intersection of Texas Highway 326 and Texas Highway 92 in Silsbee; 3.3 miles south on Texas Highway 92 to Andover Road; 0.4 mile east on Andover Road to timber company gate; 2 miles east on forest road, then south 0.2 mile and east 1.4 miles to power line right-of-way; 0.2 mile east on right-of-way; 50 feet south in woodland; USGS Evadale topographic quadrangle; lat. 30 degrees 18 minutes 00.8 seconds N. and lat. 94 degrees 07 minutes 22.5 seconds W.

A—0 to 5 inches; brown (10YR 4/3) very fine sandy loam; moderate fine granular structure; slightly hard, friable; many very fine to coarse roots; common fine tubular pores; 1 percent fine rounded iron-manganese concretions; common fine cylindrical wormcasts; few medium and coarse distinct dark gray (10YR 4/1) organic stains between peds; 1 percent fine prominent yellowish red (5YR 5/6) iron concentrations with clear boundaries between peds; very strongly acid; clear smooth boundary.

E—5 to 11 inches; light yellowish brown (10YR 6/4) very fine sandy loam; moderate fine and medium angular blocky structure; slightly hard, friable; many very fine and medium, and common coarse roots; common fine tubular and interstitial pores; common fine cylindrical wormcasts; few discontinuous dark gray (10YR 4/1) organic coats on surfaces of peds; 1 percent fine distinct very dark gray (10YR 3/1) iron-manganese stains on surfaces of peds; 1 percent fine rounded iron-manganese concretions; 5 percent medium and coarse prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries between peds; 2 percent fine and medium prominent light brownish gray (2.5Y 6/2) iron depletions with clear boundaries between peds; very strongly acid; clear smooth boundary.

Bt—11 to 25 inches; red (2.5YR 4/6) clay; moderate fine and medium subangular blocky structure; very hard, very firm; common very fine to medium roots; common very fine tubular pores; common distinct pressure faces; very few faint red (2.5YR 4/6) clay films on surfaces of peds; 6 percent fine prominent light olive brown (2.5Y 5/3) iron concentrations with sharp boundaries along roots; very strongly acid; gradual wavy boundary.

Btss1—25 to 37 inches; red (2.5YR 4/6) clay; moderate medium prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine and fine roots; common very fine tubular pores; few distinct pressure faces; common distinct pale red (2.5YR 6/2) intersecting slickensides; few faint red (2.5YR 4/6) clay films on surfaces of peds and in pores; 2 percent fine prominent reddish yellow (7.5YR 6/6) iron concentrations with clear boundaries between peds; 8 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries along roots; 25 percent fine and medium prominent light brownish gray (2.5Y 6/2) iron depletions with sharp boundaries on surfaces of slickensides; very strongly acid; gradual wavy boundary.

Btss2—37 to 50 inches; 65 percent red (2.5YR 4/6) and 35 percent light brownish gray (2.5Y 6/2) clay; moderate medium prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine and fine roots; common very fine tubular pores; few faint red (2.5YR 4/6) clay films on surfaces of peds and in pores; few distinct pressure faces; common distinct light brownish gray (2.5Y 6/2) intersecting slickensides; 2 percent fine prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries along roots; very strongly acid; gradual wavy boundary.

Btss3—50 to 58 inches; 50 percent red (2.5YR 4/6) and 40 percent gray (2.5Y 6/1) clay; moderate medium prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common very fine roots; few fine tubular pores; few faint red (2.5YR 4/6) clay films on surfaces of peds and in pores; few distinct pressure faces; common distinct gray (2.5Y 6/1) intersecting slickensides; 8 percent fine prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries along roots and between peds; 5 percent fine prominent reddish yellow (7.5YR 6/6) iron concentrations with clear boundaries between peds; very strongly acid; clear smooth boundary.

BCtg—58 to 74 inches; 50 percent light brownish gray (10YR 6/2) and 40 percent strong brown (7.5YR 5/8) sandy clay loam; weak coarse prismatic structure parting to weak fine and medium subangular blocky; very hard, very firm; common very fine roots; few fine tubular pores; few distinct gray (2.5Y 6/1) clay films on surfaces of peds and in pores; few distinct gray (2.5Y 6/1) intersecting slickensides; very few silt coats on surfaces of peds and in pores; 8 percent fine prominent red (2.5YR 5/8) iron concentrations with sharp boundaries; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries; very strongly acid; clear wavy boundary.

C—74 to 80 inches; 55 percent brownish yellow (10YR 6/6) loamy fine sand; weak medium angular blocky structure; hard, firm; common very fine roots; few distinct yellowish red (5YR 5/6) clay films on surfaces of peds and in pores; 5 percent fine and medium prominent red (2.5YR 5/6) iron concentrations with clear boundaries between peds; 6 percent fine and medium prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries; 20 percent fine and medium prominent gray (2.5Y 6/1) iron depletions with clear boundaries; 15 percent light gray (10YR 7/2) albic material; very strongly acid.

Solum thickness is more than 80 inches. Base saturation ranges from 45 to 55 percent. Reaction is very strongly acid to moderately acid throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Areas with values of 3, and chroma of 2 or 3 are less than 10 inches thick. Texture is very fine sandy loam or loam. Iron concentrations in shades of brown or red range from 0 to 5 percent.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. Texture is very fine sandy loam or loam. Iron concentrations in shades of yellow or brown range from 1 to 8 percent. Iron depletions in shades of gray range from 0 to 3 percent.

The Bt horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 4 to 8. Texture is clay loam or clay. Iron concentrations in shades of yellow or brown range from 5 to 30 percent. Iron depletions in shades of gray range from 0 to 5 percent.

The Btss horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 4 to 8. Texture is clay loam or clay. Slickensides and pressure faces range from 5 to 35 percent. Iron concentrations in shades of red, yellow, or brown range from 5 to 30 percent. Iron depletions in shades of gray range from 1 to 25 percent.

Where present, the Btg horizon has a mottled matrix. Gray colors make up 55 to 70 percent of the matrix and have hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1. Red or brown colors make up 30 to 45 percent and have hue of 10R to 7.5YR, value of 4 to 6, and chroma of 6 to 8. Texture is sandy clay loam, loam, or clay loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent.

The BCt has hue of 7.5YR or 10YR, value of 6, and chroma of 2 to 6. Texture is loam, sandy clay loam, or clay loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent. Iron depletions in shades of gray range from 1 to 25 percent. Streaks and pockets of albic material range from 0 to 10 percent. Some pedons are stratified with thin layers of sand or loamy sand.

The C horizon has hue of 7.5YR or 10YR, value of 6, and chroma of 4 to 6. Texture is loamy fine sand or fine sandy loam. Iron concentrations in shades of red, yellow, or brown range from 2 to 20 percent. Iron depletion in shades of gray range from 1 to 20 percent. Streaks and pockets of albic material range from 0 to 15 percent. Some pedons are stratified with thin layers of sand or loamy sand.

Texla Series

The Texla series consists of very deep, somewhat poorly drained, very slowly permeable soils. These soils formed in loamy and clayey sediments on nearly level coastal plains of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Texla series are fine-silty, siliceous, active, thermic Oxyaquic Glossudalfs.

Typical pedon of Texla silt loam in an area Evadale-Texla complex, 0 to 1 percent slopes; from the intersection of Texas Highway 326 and Texas Highway 105 in Sour Lake, Texas; 6.4 miles east on Texas Highway 105, 3.1 miles north and 0.9 mile east on forest road, then 0.2 mile north on forest road; 75 feet west in forest; USGS Bevil Oaks topographic quadrangle; lat. 30 degrees 11 minutes 08.0 seconds N. and lat. 94 degrees 16 minutes 54.0 seconds W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; soft, very friable; many very fine to coarse roots; common fine and medium interstitial pores; common fine wormcasts; very strongly acid; clear smooth boundary.

E—5 to 11 inches; light yellowish brown (10YR 6/4) silt loam; weak coarse prismatic structure; soft, very friable; many very fine to medium and common coarse roots; many fine and medium interstitial pores; few distinct dark grayish brown (10YR 4/2) organic coats on surfaces of peds and in pores; 5 percent fine distinct brownish yellow (10YR 6/8) iron concentrations with clear boundaries; very strongly acid; clear smooth boundary.

E/Bt—11 to 17 inches; 55 percent light yellowish brown (10YR 6/4) (E) silt loam; 30 percent brownish yellow (10YR 6/8) (Bt) moderate medium and coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable; many very fine roots; common fine and medium interstitial pores; very few faint reddish yellow (7.5YR 6/6) clay films on surfaces of peds and in pores; 2 percent fine rounded ironstone nodules; few fine wormcasts; 8 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries on surfaces of peds; 5 percent fine and medium prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries on surfaces and between peds; 2 percent fine faint light brownish gray (10YR 6/2) iron depletion around roots; extremely strongly acid; clear smooth boundary.

Bt/E—17 to 38 inches; 40 percent brownish yellow (10YR 6/6) (Bt) silt loam; 20 percent pale brown (10YR 6/3) (E); weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; common very fine roots; common fine and common medium tubular pores; few distinct yellowish brown (10YR 5/8) clay films on surfaces of peds and in pores; few fine wormcasts; 20 percent fine and medium prominent yellowish red (5YR 5/6) iron concentrations with clear boundaries; 5 percent fine and medium prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; 7 percent fine and medium distinct brownish yellow (10YR 6/8) iron concentrations with clear boundaries between peds; 5 percent fine distinct light brownish gray (10YR 6/2) iron depletions with sharp boundaries between peds; 2 percent fine distinct light gray (10YR 7/1) iron depletions with sharp boundaries between peds; extremely acid; clear wavy boundary.

Bt1—38 to 45 inches; 55 percent light yellowish brown (10YR 6/4) clay loam; moderate fine and medium prismatic structure; hard, very firm; common very fine to medium roots; common fine tubular pores; few distinct brownish yellow (10YR 6/6) clay films on surfaces of peds and in pores and very few faint brown (10YR 5/3) clay films on surfaces of peds and in pores; 8 percent fine and medium prominent red (2.5YR 4/8) iron concentrations with sharp boundaries; 5 percent fine prominent red (2.5YR 5/8) iron concentrations with sharp boundaries; 10 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries; 10 percent streaks and pockets of very pale brown (10YR 7/3) (E) silt loam; 10 percent fine and medium prominent light gray (10YR 7/1) iron depletions with clear boundaries along roots and pores; very strongly acid; gradual wavy boundary.

Bt2—45 to 67 inches; 40 percent brownish yellow (10YR 6/6) and 30 percent red (2.5YR 4/8) and 30 percent gray (2.5Y 6/1) silty clay loam; moderate fine and medium prismatic structure; very hard, very firm; common very fine roots; common fine tubular pores; few faint gray (2.5Y 6/1) clay films on surfaces of peds and in pores and very few faint brownish yellow (10YR 6/6) clay films on surfaces of peds and in pores; few crawfish krotovinas; few distinct pressure faces; few faint intersecting slickensides; 2 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with sharp boundaries between peds; 2 percent streaks and pockets of light gray (10YR 7/1) albic material on vertical surfaces of prisms; very strongly acid; gradual wavy boundary.

Bt3—67 to 80 inches; 30 percent brownish yellow (10YR 6/8) and 25 percent red (2.5YR 4/8), and 40 percent light gray (2.5Y 7/1) silty clay loam; moderate fine and medium prismatic structure; extremely hard, extremely firm; few fine and medium roots; 5 percent fine prominent yellowish brown (10YR 5/8) iron concentrations with sharp boundaries in light gray (2.5Y 7/1) matrix; very strongly acid.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 20 to 35 percent, and the percent of sand greater than very fine sand ranges from 8 to 14 percent. These soils are saturated at 38 inches from December to March in most years.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Iron concentrations in shades of brown range from 0 to 2 percent. Reaction is extremely acid or very strongly acid.

The E horizon has hue of 10YR, value of 6 or 7 and chroma of 3 or 4. Iron concentrations in shades of yellow or brown range from 1 to 8 percent. Reaction is extremely acid or very strongly acid.

The E part of the E/Bt horizon has hue of 10YR, value of 6 or 7, and chroma of 3 or 4. The Bt part has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. Iron concentrations in shades of red, yellow, or brown range from 5 to 20 percent. Iron depletions in shades of gray range from 0 to 5 percent. Reaction ranges from extremely acid to strongly acid. This horizon is absent in some pedons.

The Bt part of the Bt/E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. The E has hue of 10YR, value of 6 or 7, and chroma of 3 or 4. Texture is silt loam or silty clay loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 30 percent. Iron depletions in shades of gray range from 1 to 20 percent. Reaction ranges from extremely acid to strongly acid.

The Bt horizon has a mottled matrix. Red, yellow, and brown colors in hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8 dominate the matrix. Gray colors in hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 make up 30 to 40 percent of the matrix. Texture is silty clay loam, silty clay, or clay. Albic material ranges from 0 to 10 percent. Pressure faces and slickensides range from 5 to 35 percent. Iron concentrations range in shades of red, yellow, or brown range from 5 to 30 percent. Iron depletions in shades of gray range from 1 to 20 percent. Reaction ranges from very strongly acid to moderately acid.

Turkey Series

The Turkey series consists of very deep, somewhat excessively drained, moderately rapid permeable soils. These soils formed in sandy sediments on nearly level and very gently sloping terraces of late Pleistocene age. Slope ranges from 1 to 3 percent. Soils of the Turkey series are thermic, coated Typic Quartzipsamments.

Typical pedon of Turkey sand, 1 to 3 percent slopes; from the intersection of Texas Highway 327 and Farm Road 92 in Silsbee; 2.3 miles west on Texas Highway 327 to the intersection with county road; 1 mile north on county road to the intersection with county road; 1.3 miles west on county road; 0.6 mile south and east; 300 feet south in woodland; USGS Silsbee topographic quadrangle; lat. 30 degrees 21 minutes 46.0 seconds N. and lat. 94 degrees 13 minutes 54.0 seconds W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) sand; weak fine subangular blocky structure; loose, very friable; many very fine and fine, and few medium and coarse roots; common fine and medium pores; very strongly acid; clear smooth boundary.

C1—5 to 10 inches; dark brown (7.5YR 4/4) sand; weak fine subangular blocky structure; loose, very friable; many very fine and fine, and few medium and coarse roots; common fine and medium pores; few old root channels filled with very dark grayish brown (10YR 3/2) sand; very strongly acid; gradual smooth boundary.

C2—10 to 20 inches; yellowish red (5YR 4/6) sand; weak coarse prismatic structure parting to weak fine and medium subangular blocky; loose, very friable; common very fine and fine, and few medium and coarse roots; common medium pores; common fine prominent brown (7.5YR 5/4) iron stains with sharp boundaries; few fine pinkish gray (7.5YR 7/2) albic materials along root channels and on surfaces of prisms; very strongly acid; gradual smooth boundary.

C3—20 to 33 inches; yellowish red (5YR 5/6) sand; weak coarse prismatic structure parting to weak fine and medium subangular blocky; loose, very friable; few very fine to medium roots; common medium pores; common fine and medium prominent brown (7.5YR 5/4) iron stains with sharp boundaries; few fine pinkish gray (7.5YR 7/2) albic material along root channels and on surfaces of prisms; very strongly acid; gradual smooth boundary.

C4—33 to 52 inches; yellowish red (5YR 5/6) sand; weak coarse prismatic structure parting to weak fine and medium subangular blocky; loose, very friable; common fine roots; common fine pores; few fine and medium prominent pink (7.5YR 7/4) iron stains with clear boundaries on surfaces of peds; few fine prominent pinkish gray (7.5YR 7/2) albic materials along root channels and on surfaces of prisms; very strongly acid; diffuse irregular boundary.

C5—52 to 80 inches; strong brown (7.5YR 5/8) sand; weak coarse prismatic structure; loose, very friable; common medium pores; few fine prominent pink (7.5YR 7/4) iron stains on surfaces of peds; few fine pinkish gray (7.5YR 7/2) albic materials on surfaces of prisms; very strongly acid.

Solum thickness is more than 80 inches. Weighted average clay content in the particle-size control section ranges from 5 to 7 percent and sand content ranges from 80 to 90 percent. The texture is sand or loamy sand throughout. Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Pedons with color value of 3 and chroma of 2 or 3, are less than 10 inches thick.

The C horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. It has few to common iron stains on sand grains in shades of yellow or brown. Albic materials in shades of gray or white are few to common and along root channels and prism faces.

Tyden Series

The Tyden series consists of very deep, very poorly drained, slowly permeable soils. These soils formed in sandy and loamy sediments on nearly level river valleys of late Pleistocene age. Slopes are 0 to 1 percent.

Soils of the Tyden series are coarse-loamy, siliceous, active, thermic Umbric Paleaquults.

Typical pedon of Tyden silt loam (fig. 26) in an area of Tyden-Babco complex, 0 to 1 percent slopes; from the intersection of U.S. Highway 69 and Farm Road 326 in Kountze; 7.8 miles north on U.S. Highway 69 to the intersection with Farm Road 420; 3.8 miles east on Farm Road 420 to the intersection with county road; 1.3 miles on county road to the intersection with forest road; 0.6 mile north and east on forest road and pipeline; 150 feet north of pipeline; USGS Kountze North topographic quadrangle; lat. 30 degrees 28 minutes 47.6 seconds N. and lat. 94 degrees 18 minutes 53.1 seconds W.

A1—0 to 6 inches; black (10YR 2/1) silt loam; weak fine platy structure; many very fine to coarse roots; common fine and medium pores; 25 percent organic material consisting of partially decomposed forest litter on surface; extremely acid; clear smooth boundary.

A2—6 to 13 inches; very dark gray (10YR 3/1) very fine sandy loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; common fine to coarse roots; common fine and medium pores; extremely acid; clear smooth boundary.

A/Eg—13 to 19 inches; 80 percent dark gray (10YR 4/1) (A) very fine sandy loam; 20 percent light brownish gray (10YR 6/2) (Eg); weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; common fine roots; many fine and medium pores; few crawfish krotovinas filled with very dark gray (10YR 3/1) very fine sandy loam; the Eg part consists of albic material on surfaces of prisms; extremely acid; clear wavy boundary.

Eg/Btg1—19 to 28 inches; 70 percent grayish brown (10YR 5/2) (Eg) fine sandy loam; 30 percent dark grayish brown (10YR 4/2) (Btg); moderate coarse subangular blocky structure parting to moderate medium angular blocky; hard, friable; common fine roots between peds; many fine to coarse pores; few crawfish krotovinas filled with dark gray (10YR 4/1) very fine sandy loam; 2 percent fine and medium distinct dark yellowish brown (10YR 4/4) iron concentrations with clear boundaries in root channels and in pores in the Btg part; 5 percent brittle material that is 2 to 5 inches wide; extremely acid; gradual wavy boundary.

Eg/Btg2—28 to 41 inches; 50 percent light brownish gray (10YR 6/2) (Eg) fine sandy loam; 40 percent grayish brown (10YR 5/2) (Btg); moderate coarse prismatic structure parting to moderate medium angular blocky; hard, firm; common fine roots between peds; many fine to coarse pores; few crawfish krotovinas filled with dark gray (10YR 4/1) very fine sandy loam; 6 percent fine and medium distinct yellowish brown (10YR 5/6) and 3 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with diffuse boundaries in the Btg part; 15 percent brittle material that is 2 to 5 inches wide with nonbrittle material in between; extremely acid; gradual irregular boundary.

Btg/Eg1—41 to 58 inches; 55 percent grayish brown (10YR 5/2) (Btg) fine sandy loam; 45 percent light gray (10YR 7/2) (Eg); moderate coarse prismatic structure parting to weak coarse subangular blocky; hard, firm; common very fine roots between peds; many fine to coarse pores; very few faint grayish brown (10YR 5/2) clay films on surfaces of peds; few crawfish krotovinas filled with dark gray (10YR 4/1) very fine sandy loam; common fine threads of barite; 2 percent fine distinct yellowish brown (10YR 5/6) iron concentrations with diffuse boundaries on surfaces of peds in Btg; the Eg part of the horizon consists of albic material 1/2 to 3 inches wide on surfaces of prisms and is a clay depletion because of aquic conditions; 55 percent brittle material that is 2 to 10 inches; extremely acid; gradual irregular boundary.

Btg/Eg2—58 to 73 inches; 70 percent light brownish gray (10YR 6/2) (Btg) fine sandy loam; 30 percent pinkish gray (7.5YR 7/2) (Eg); moderate coarse prismatic structure parting to weak coarse subangular blocky; hard, firm; few very fine roots between peds; many fine to coarse pores; few faint continuous light brownish gray (10YR 6/2) clay films on surfaces of prisms and in pores; common fine threads of barite; 2 percent fine distinct yellowish brown (10YR 5/6) iron concentrations with diffuse boundaries on surfaces of peds in the Btg part; the Eg part consists of albic material 1/2 to 3 inches wide on surfaces of prisms and is a clay depletion because of aquic conditions; 20 percent of the horizon is brittle material that is 2 to 8 inches wide; extremely acid; gradual irregular boundary.

Btg/Eg3—73 to 80 inches; 55 percent light brownish gray (10YR 6/2) (Btg) loam; 25 percent pinkish gray (7.5YR 7/2) (Eg); moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; few very fine roots between peds;

many fine and medium pores; 8 percent fine and medium yellowish brown (10YR 5/6), 2 percent fine and medium prominent strong brown (7.5YR 5/6), and 8 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries in the Btg part; the Eg part consists of albic material 1/4 to 2 inches wide on surfaces of peds and is a clay depletion because of aquic conditions; 20 percent of the total volume is brittle material that is 2 to 8 inches wide; extremely acid; gradual irregular boundary.

Solum thickness is more than 80 inches. Weighted average clay content of the particle-size control section is 3 to 12 percent. Base saturation is 10 to 25 percent at 180 centimeters. Reaction is extremely acid or very strongly acid throughout.

The upper part of the A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Texture is very fine sandy loam, fine sandy loam, or silt loam.

The lower part of the A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. Texture is very fine sandy loam, fine sandy loam, or silt loam.

The A part of the A/Eg horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. The Eg part has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is very fine sandy loam, fine sandy loam, or silt loam. The E part makes up 20 to 40 percent of the horizon.

Figure 26.—Profile of Tyden silt loam in an area of Tyden-Babco complex, 0 to 1 percent slopes.

The Eg part of the Eg/Btg horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. The Btg part has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. Texture is very fine sandy loam, fine sandy loam, or silt loam. The E part is in the form of streaks and pockets of albic material on surfaces of prisms. The Btg makes up 20 to 40 percent of the horizon. Iron concentrations in shades of yellow or brown range from 2 to 15 percent. Brittle material ranges from 5 to 25 percent. Some pedons have up to 2 percent siliceous pebbles.

The Btg part of the upper Btg/Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The Eg part has hue of 7.5YR to 2.5Y, value of 7 or 8, and chroma of 1 or 2. The Eg part makes up 20 to 40 percent and is in the form of streaks and pockets of albic materials. Texture is fine sandy loam, loam, or silt loam. Iron concentrations in shades of red, yellow, or brown range from 3 to 15 percent and mostly occur in the Btg part. Brittle material ranges from 15 to 60. Some pedons have up to 2 percent siliceous pebbles.

The Btg part of the lower Btg/Eg horizon has hue of 10YR to 5Y, value of 6 or 7, and chroma of 1 or 2. The Eg part has hue of 10YR or 2.5Y, value of 7 or 8, and chroma of 1 or 2. The E part makes up 20 to 40 percent and is in the form of streaks and pockets of albic materials. Texture is fine sandy loam, loam, or sandy clay loam. Iron concentrations in shades of red, yellow, or brown range from 3 to 15 percent and mostly occur in the Btg part. Brittle material ranges from 15 to 40 percent. Some pedons have up to 2 percent siliceous pebbles.

Vamont Series

The Vamont series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed from alkaline clayey sediments. These soils are on nearly level coastal plains of late Pleistocene age. Slopes are 0 to 1 percent. The soils of the Vamont series are fine, smectitic, thermic Oxyaquic Hapluderts.

Typical pedon of Vamont clay, 0 to 1 percent slopes; from the intersection of Texas Highway 770 and Texas Highway 787 in Saratoga; 6.7 miles northwest on Texas Highway 787 to forest road; 3.1 miles southwest on forest road; 0.3 mile west on forest road; 100 feet north in pine plantation; USGS Arizona Creek topographic quadrangle; lat. 30 degrees 19 minutes 30.0 seconds N. and lat. 94 degrees 37 minutes 40.0 seconds W.

A—0 to 5 inches; grayish brown (10YR 5/2) clay, moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; many very fine to medium roots; very few faint dark grayish brown (10YR 4/2) organic coats on surfaces of peds; few bits of charcoal; many fine and medium interstitial and tubular pores; 4 percent fine and medium prominent strong brown (7.5YR 4/6) iron concentrations along roots and pores; extremely acid; clear smooth boundary.

Bw—5 to 19 inches; 50 percent reddish yellow (7.5YR 6/8) and 50 percent light gray (10YR 7/2) clay; moderate fine and medium angular blocky structure; very hard, very firm, very sticky and very plastic; many very fine and fine roots; common fine and medium tubular pores; few distinct pressure faces; 3 percent fine prominent yellowish red (5YR 5/8) iron concentrations along roots, pores, and surfaces of peds; extremely acid; gradual wavy boundary.

Bssg1—19 to 44 inches; 55 percent light gray (10YR 7/2) and 40 percent reddish yellow (7.5YR 6/8) clay; moderate medium angular blocky structure; extremely hard, extremely firm, very sticky and very plastic; many very fine and fine, and few medium roots; common fine tubular pores; common distinct pressure faces; 5 percent fine prominent yellowish red (5YR 5/8) iron concentrations along roots, pores, and surfaces of peds; common distinct intersecting slickensides; extremely acid; gradual wavy boundary.

Bssg2—44 to 66 inches; light gray (N 7/) clay; moderate fine and medium angular blocky structure; extremely hard, extremely firm, very sticky and very plastic; common very fine and fine roots; few fine tubular pores; common distinct pressure faces; many distinct intersecting slickensides; 8 percent fine and medium prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries; 5 percent medium and coarse prominent red (2.5YR 4/6) iron concentrations with sharp boundaries; 2 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries along roots, pores, and surfaces of peds; very strongly acid; gradual wavy boundary.

Bssg3—66 to 80 inches; 50 percent light gray (N 7/) and 35 percent strong brown (7.5YR 5/8) clay; moderate fine and medium angular blocky structure; extremely hard, extremely firm, very sticky and very plastic; common very fine and fine roots; few fine tubular pores; common distinct pressure faces; many distinct intersecting slickensides; 15 percent fine and medium faint reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries on surfaces of peds; 1 percent fine distinct greenish gray (5BG 6/1) iron depletions with diffuse boundaries along roots; very strongly acid.

The range of characteristics includes 50 percent or more of the pedon. Solum thickness is more than 80 inches. Weighted clay in the particle-size control section ranges from 50 to 60. When dry, cracks 1/2 inch to more than 1 inch wide extend from the surface to a depth of 12 inches or more. Cracks remain open for less than 60 days in most years. Slickensides and wedge-shaped peds begin at a depth ranging from 10 to 19 inches. Undisturbed areas have gilgai microrelief with microhighs 6 to 15 inches higher than the microdepressions. Microhighs make up 5 to 25 percent of the pedon. Typically, colors in the upper part of the microhigh have a value of 4 or more. Reaction is extremely acid to strongly acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2. Iron concentrations in shades of brown range from 1 to 8 percent. Organic stains in shades of brown and gray range from 1 to 5 percent.

The Bw horizon has 50 percent or more hue of 7.5YR or 10YR, value of 6, and chroma of 6 to 8. The remainder has hue of 10YR, value 5 to 7, and chroma 1 or 2. Iron concentrations in shades of red, yellow, or brown range from 2 to 25 percent. Pressure faces and slickensides range from 5 to 20 percent.

The upper part of the Bssg has a mottled matrix with a dominant hue of 10YR, 7.5YR or N, value 5 to 7, and chroma 0 to 8. The lower Bssg has hue 10YR and N, value 5 to 7, and chroma 0 to 1. Iron concentrations in shades of red, yellow, or brown range from 5 to 30 percent. Iron depletions in shades of gray range from 1 to 5 percent. Pressure faces and slickensides range from 15 to 45 percent. Some pedons have few fine masses and hard-pitted concretions of calcium carbonate at depths more than 55 inches.

Votaw Series

The Votaw series consists of very deep, moderately well drained, moderately rapidly permeable soils. These soils formed in sandy sediments on nearly level terraces of late Pleistocene age. Slopes are 0 to 1 percent. Soils of the Votaw series are thermic, coated Oxyaquic Quartzipsamments

Typical pedon of Votaw fine sand, 0 to 1 percent slopes; from the intersection of Farm Road 92 and Farm Road 1122 in Silsbee; 1.8 miles north on Farm Road 2937 to intersection with county road; 2.1 miles east on county road to forest road; 0.6 mile north on forest road, then 0.2 mile west and 0.5 mile south; 100 feet west in forest; USGS Deserter Baygall topographic quadrangle; lat. 30 degrees 24 minutes 59.0 seconds N. and lat. 94 degrees 08 minutes 37.0 seconds W.

A—0 to 4 inches; 70 percent dark grayish brown (10YR 4/2) and 30 percent light gray (10YR 7/2) fine sand; single grained; soft, loose; many fine to coarse roots; many very fine to medium pores; 1 percent fine and medium distinct yellowish brown (10YR 5/4) organic stains; very strongly acid; abrupt smooth boundary.

C1—4 to 9 inches; 45 percent yellowish brown (10YR 5/6) and 25 percent yellowish brown (10YR 5/4) fine sand; weak coarse prismatic structure; soft, loose; many fine to coarse roots; common medium pores; 25 percent root channels filled with grayish brown (10YR 5/2), light gray (10YR 7/2), light brownish gray (10YR 6/2), and dark grayish brown (10YR 4/2) loamy sand; 5 percent fine distinct strong brown (7.5YR 5/6) iron concentrations with clear boundaries; strongly acid; clear smooth boundary.

C2—9 to 15 inches; 45 percent yellowish brown (10YR 5/4) and 45 percent yellowish brown (10YR 5/6) fine sand; weak coarse prismatic structure; soft, loose; many fine and medium, and common coarse roots; common medium pores; 5 percent root channels filled with light brownish gray (10YR 6/2), light gray (10YR 7/2), grayish brown (10YR 5/2), and dark grayish brown (10YR 4/2) loamy sand; 2 percent fine distinct light gray (10YR 7/2) masses of clean sand grains along pores; 5 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries; strongly acid; clear wavy boundary.

C3—15 to 25 inches; 45 percent yellowish brown (10YR 5/4) and 40 percent yellowish brown (10YR 5/6) fine sand; weak coarse prismatic structure; soft, loose; many fine and medium and common coarse roots; common medium pores; 5 percent root channels filled with light brownish gray (10YR 6/2) and light gray (10YR 7/2) loamy sand; 2 percent light gray (10YR 7/2) sand coats on vertical surfaces of peds; 5 percent fine and medium distinct brown (7.5YR 5/4) iron concentrations with clear boundaries; 5 percent fine and medium prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries; moderately acid; clear wavy boundary.

C4—25 to 29 inches; 45 percent yellowish brown (10YR 5/4) and 40 percent yellowish brown (10YR 5/6) fine sand; weak coarse prismatic structure; soft, loose; common fine to coarse roots; common medium pores; 1 percent fine and medium black (N 2.5/) iron-manganese concentrations with clear boundaries; 10 percent fine and medium prominent brown (7.5YR 4/4) iron concentrations with clear boundaries; 3 percent fine and medium distinct brown (7.5YR 5/4) iron concentrations with clear boundaries; 2 percent light gray (10YR 7/2) masses of clean sand along surfaces of peds; moderately acid; clear broken boundary.

C5—29 to 47 inches; 50 percent brownish yellow (10YR 6/6) fine sand; weak coarse prismatic structure; soft, loose; common fine to coarse roots; common fine and few medium pores; 15 percent fine and medium distinct strong brown (7.5YR 5/6) iron concentrations with clear boundaries; 1 percent fine prominent yellowish red (5YR 5/6) iron concentrations with diffuse boundaries; 35 percent coarse prominent light gray (2.5Y 7/2) iron depletions; moderately acid; gradual wavy boundary.

C6—47 to 63 inches; 30 percent very pale brown (10YR 7/4) fine sand; weak coarse prismatic structure; soft, loose; common fine and medium roots; common fine pores; 1 percent thin very pale brown (10YR 8/3) clay coats and 1 percent strong brown (7.5YR 5/6) clay coats on sand grains and bridging between sand grains; 25 percent coarse prominent reddish yellow (7.5YR 6/8) iron concentrations with clear boundaries; 10 percent medium and coarse distinct brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries; 10 percent fine and medium prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries; 25 percent coarse faint light gray (10YR 7/2) iron depletions; strongly acid; gradual wavy boundary.

Cg—63 to 80 inches; light gray (2.5Y 7/2) fine sand; massive; soft, loose; common fine and medium roots; common fine pores; 35 percent fine and medium prominent yellow (10YR 7/6) iron concentrations with diffuse boundaries; 10 percent fine and medium prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries; strongly acid.

Solum thickness is more than 80 inches. Weighted average clay content in the particle-size control section ranges from 1 to 8 percent. The weighted average silt plus clay content in the particle-size control section ranges from 5 to 10 percent. Texture is fine sand or loamy fine sand throughout. Reaction ranges from very strongly acid to moderately acid throughout.

The A horizon has hue of 10YR, value of 4 to 7, and chroma of 2 to 4.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 4 to 6. Masses of iron accumulation range from few to many in shades of yellow or brown with clear and diffuse boundaries. Masses of iron-manganese range from 0 to 5 percent. Iron depletions in the form of clean sand grains range from few to many in shades of white or gray.

The Cg has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 or 2. Masses of iron accumulation range from few to many in shades of yellow or brown with clear and diffuse boundaries.

Waller Series

The Waller series consists of very deep, poorly drained, slowly permeable soils. These nearly level soils formed in loamy sediments of early to mid Pleistocene age. Slopes are 0 to 1 percent. Soils of the Waller series are fine-loamy, siliceous, active, thermic Typic Glossaqualfs

Typical pedon of Waller very fine sandy loam (fig. 27) in an area of Waller-Dallardsville complex, 0 to 1 percent slopes; from the intersection of Farm Road 770 and Farm Road 2798 in Votaw; 4.2 miles west on Farm Road 770 to intersection with county road; 0.2 mile north on county road to forest road; 0.5 mile northeast on forest road, then 2.1 miles east; 125 feet south in forest; USGS Votaw topographic quadrangle; lat. 30 degrees 26 minutes 53.3 seconds N. and lat. 94 degrees 42 minutes 00.1 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak medium subangular blocky structure; slightly hard, very friable; many fine and medium roots; many fine and medium interstitial pores; 10 percent crawfish krotovinas filled with pinkish gray (7.5YR 7/2) very fine sand and dark grayish brown (10YR 4/2) silt loam; 2 percent fine distinct brown (7.5YR 4/4) iron concentrations with diffuse boundaries along roots and pores; very strongly acid; clear smooth boundary.

Eg—3 to 11 inches; light (10YR 7/2) silt loam; weak coarse subangular blocky structure; slightly hard, firm; common fine and medium roots; many very fine and fine interstitial pores; 20 percent crawfish krotovinas filled with pinkish gray (7.5YR 7/2) very fine sand and dark grayish brown (10YR 4/2) silt loam; 8 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries along roots and pores; 2 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries along roots and pores; very strongly acid; clear smooth boundary.

Eg/Btg—11 to 30 inches; 60 percent light gray (10YR 7/2) (Eg) silt loam; 20 percent gray (10YR 6/1) (Btg); weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, firm; common very fine and fine roots; common very fine and fine tubular pores; 15 percent crawfish krotovinas; 12 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with diffuse boundaries along roots and pores; 2 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries along roots and pores; very strongly acid; clear wavy boundary.

Btg/Eg1—30 to 43 inches; 40 percent gray (10YR 6/1) (Btg) clay loam; 20 percent light gray (10YR 7/1) and 10 percent pinkish white (7.5YR 8/2) (Eg); weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, firm; common very fine and fine roots between peds; common very fine tubular pores; 15 percent crawfish krotovinas; 15 percent fine and medium prominent brownish yellow (10YR 6/6) iron concentrations with diffuse boundaries; 8 percent fine prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries along roots and pores; very strongly acid; gradual wavy boundary.

Btg/Eg2—43 to 56 inches; 60 percent gray (10YR 6/1) (Btg) clay loam; 10 percent light gray (10YR 7/1) and 5 percent pinkish gray (7.5YR 7/2) (Eg); weak medium prismatic structure parting to weak fine and medium angular blocky; hard, firm; common very fine roots between peds; common very fine tubular pores; 2 percent crawfish krotovinas; 15 percent fine and medium distinct brownish yellow (10YR 6/6) with diffuse boundaries; 10 percent fine and medium prominent strong brown (7.5YR 5/8) iron concentrations with clear boundaries in the Btg part; 2 percent fine prominent red (2.5YR 5/8) iron concentrations with clear boundaries in the Btg part; very strongly acid; gradual wavy boundary.

Btg/Eg3—56 to 65 inches; 50 percent gray (10YR 6/1) (Btg) clay loam; 20 percent light gray (10YR 7/1) (Eg); weak coarse prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm; common very fine roots between peds; common very fine tubular pores; 2 percent crawfish krotovinas; few fine rounded black (N 2.5/) iron-manganese concretions; 20 percent fine and medium prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries in the Btg; 8 percent fine prominent yellowish red (5YR 5/8) iron concentrations with clear boundaries in the Btg part; 5 percent fine and medium prominent pinkish gray (7.5YR 7/2) iron depletions with diffuse boundaries between peds in the Eg part; very strongly acid; gradual wavy boundary.

Btg/Eg4—65 to 80 inches; 45 percent gray (10YR 6/1) (Btg) clay loam; 15 percent gray (2.5Y 6/1) (Eg); moderate coarse prismatic structure parting to moderate medium angular blocky; very hard, very firm; common very fine roots between peds; common very fine tubular pores; 1 percent crawfish krotovinas; 15 percent fine and medium prominent yellowish brown (10YR 5/8) iron concentrations with clear boundaries in the Btg part; 20 percent fine and medium prominent pinkish gray (7.5YR 7/2) iron depletions with diffuse boundaries in the Btg part; 3 percent fine prominent greenish gray (5BG 6/1) iron depletions with diffuse boundaries in the Eg part; very strongly acid.

Solum thickness is greater than 80 inches. Weighted average clay content in the particle-size control section is 18 to 30 percent. This soil has aquic conditions near the surface from November to May in most years.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Texture is very fine sandy loam, silt loam, or loam. Iron concentrations in shades of brown range from 1 to 8 percent. Iron depletions in shades of gray range from 0 to 5 percent. Reaction is very strongly acid or strongly acid throughout.

The Eg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is very fine sandy loam, silt loam, or loam. Iron concentrations in shades of yellow or brown range from 1 to 10 percent. Iron depletions in shades of gray range from 0 to 10 percent. Reaction is extremely acid to very strongly acid.

The Eg part of the Eg/Btg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. The Btg part has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. The Btg part makes up 20 to 40 percent of the horizon. Texture is very fine sandy loam, silt loam, or loam. Iron concentrations in shades of red, yellow, or brown range from 5 to 25 percent and occur mostly occur in the Btg part. Reaction is extremely acid to very strongly acid.

The Btg part of the upper Btg/Eg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. The Eg part makes up 20 to 40 percent. The Eg part has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is loam, sandy clay loam, or clay loam. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent and occur mostly in the Btg part. Reaction is extremely acid to very strongly acid.

The Btg part of the lower Btg/Eg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is silt loam, loam, sandy clay loam, or clay loam. The Eg part makes up 15 to 40 percent of the horizon. The Eg part has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from 10 to 30 percent and mostly occur in the Btg part. Reaction is extremely acid to strongly acid.

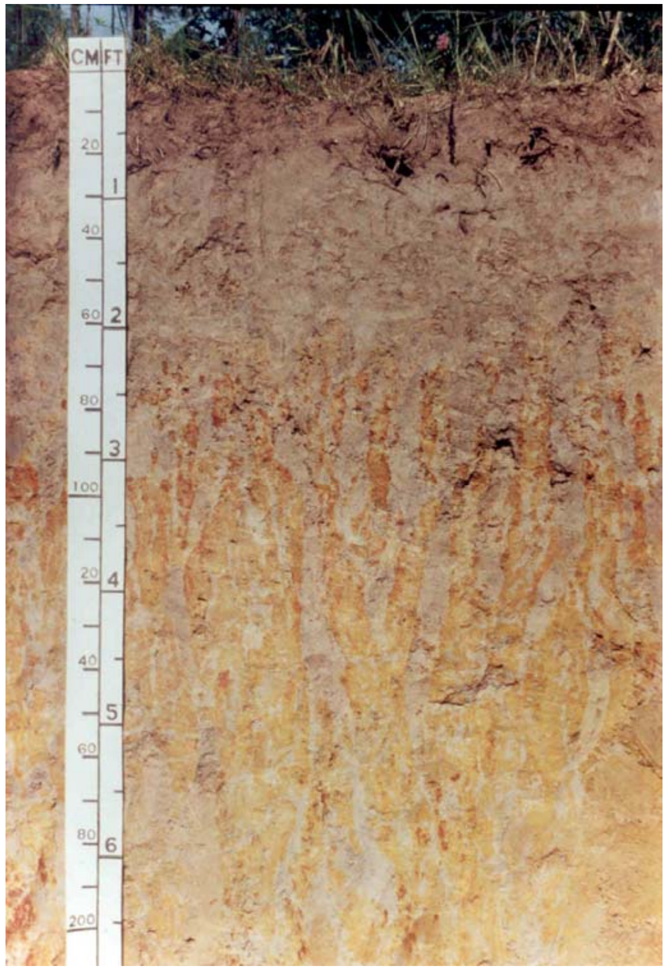


Figure 27.—Profile of Waller very fine sandy loam in an area of Waller-Dallardsville complex, 0 to 1 percent slopes.

Formation of the Soils

In this section the factors of soil formation are related to the formation of the soils in Hardin County. Also, processes of horizon differentiation and the surface geology of the county are described.

Factors of Soil Formation

Soil is formed by the action of soil-forming processes on material deposited or accumulated by geological forces. The characteristics of a soil depend on the physical and mineralogical composition of the parent material, the climate under which the soil material has accumulated and has existed since accumulation, the plant and animal life on and in the soil, the relief, and the length of time the forces of soil development have acted on the soil material.

Climate and living organisms are active factors of soil formation. They act on the parent material that has accumulated and slowly change it into a natural body that has genetically related horizons. The effects of climate and living organisms are conditioned by relief. The parent material affects the kind of soil profile that forms and, in extreme cases, determines it almost entirely. Finally, time is needed for changing the parent material into soil. Generally, a long time is needed for the development of distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effect of any one factor unless conditions are specified for the other factors.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It affects the chemical and mineral composition of the soil. The parent material in Hardin County consists of loamy and clayey sediments deposited by ancient streams and rivers. Some of the loamy and clayey sediments have been reworked and modified by the wind. Some areas have windblown sands. The geology of the parent material is described in the section "Surface Geology."

Climate

Precipitation, temperature, and wind have had a major effect on the formation of soils in Hardin County.

Wetter or drier climates in the past had an effect on how parent material was deposited. The climate was similar to the present one when the loamy and clayey parent material of the Beaumont, League, Labelle, and Anahuac soils was deposited by rivers. The climate was drier when windblown loamy sediments were deposited to form the upper parts of the Spindletop, Texla, and Gist soils.

Hardin County has a humid subtropical climate. The climate is uniform throughout the county. The dominant climatic influence on soil formation has been precipitation, which has caused the translocation of clays. The high amount of rainfall and warm temperatures has resulted in rapid soil formation.

Plant and Animal Life

Plants, microorganisms, earthworms, and other living organisms have contributed to the formation of the soils. They provide organic matter, help to decompose plant residue, influence the chemistry of the soil, and contribute to soil development. Gains in content of organic matter and nitrogen in the soil, gains and losses in plant nutrients, and changes in structure and porosity are caused by plants and animals.

Soils that formed under this vegetation, such as the League and Labelle soils, have a dark-colored surface layer that also contains an appreciable amount of organic matter. In the northernmost parts of the survey area, the native vegetation was dominantly woody plants. Soils that formed under these plants, such as Evadale, Texla, and Gist soils, have a lighter colored surface layer that has less organic matter than the soils that formed under prairie vegetation.

Relief

Relief influences soil development through its effect on drainage and runoff. If other factors are equal, the degree of profile development depends mainly on the ability for water to move through the soil. Soils in Hardin County formed in areas of low relief, making soil development and water movement onto and through the soil dependent on slope shape. Soils formed on convex slopes, such as Anahuac soils, have a high degree of soil profile development. These soils are better drained, have more vegetation, and allow for good internal downward flow of water. The internal downward flow increases profile development by leaching various minerals into the lower part of the soil profile.

Those soils on linear and concave areas, such as Evadale, Aris, and Camptown have the greatest amount of profile development. These soils drain water slowly or will pond for certain periods of the year. This excess amount of water provides a mechanism for minerals to be stripped from one area of the soil and relocated to another.

Time

The length of time that the soil-forming factors have acted on the parent material determines, to a large degree, the characteristics of the soil. Usually a long time is required for formation of soils that have distinct horizons. In Hardin County, McNeely soils are young soils that have little horizon development. Spurger soils are older soils. They have better developed horizons.

Processes of Horizon Differentiation

Soils are derived from the decomposition of the mineral particles they contain and from the plant and animal remains added to them. Silicate clays, mineral particles, humus, living organisms, and water have a major influence in determining the character of the soil. Soil layers, or horizons, are formed by additions, removals, transfers, and transformations within the soil profile (10). These processes include additions or losses of organic, mineral, and gaseous materials to the soil, transfers of material from one point to another within the soil, and physical and chemical transformation of mineral and organic materials within the soil. In most soils, more than one of these processes have been active in the development of horizons and many processes occur simultaneously.

Soil profiles are made up of a series of horizons that extend from the surface to the parent material. The parent material has been influenced little by the processes of soil formation. The horizons that make up a soil profile differ in one or more properties, such as color, texture, structure, consistence, porosity, and reaction.

Most profiles have four major horizons. These are the A, E, B, and C horizons. Some soils do not have E or B horizons.

The A horizon is the surface layer. It is the horizon that has the maximum accumulation of organic matter. Organic matter has accumulated, partially decomposed, and been incorporated into the soil. The accumulation of organic matter in soils is greatest in and above the surface layer. Many of the more stable products of organic matter decomposition remain as finely divided materials that result in darker colors, increased water-holding and cation-exchange capacities, and granulation of the soil.

The content of organic matter in the soils in Hardin County ranges from low to medium. League, Labelle, and Spindletop soils have accumulated sufficient organic matter to form a dark surface layer, or A horizon. Evadale, Aris, Texla, and Camptown soils have a low organic matter light-colored surface layer, or A horizon.

The E horizon is the subsurface layer. It is directly below the A horizon. It is characterized by the leaching of dissolved or suspended materials. Clay particles, organic matter, and oxides of free iron have been leached from the E horizon, leaving a concentration of light-colored sand and silt particles or other resistant materials. Aris, Camptown, Evadale, Texla, and Gist soils have well developed E horizons.

The B horizon is the subsoil. It is directly below the A or E horizons. It is the horizon that has the maximum accumulation of dissolved or suspended materials, such as clay and iron. It may also be an altered horizon that has a distinctly different structure than that of the A horizon but shows little evidence of clay translocation or accumulation.

A B horizon that has a significant amount of clay accumulation is called a Bt horizon. Clay accumulates in horizons largely because of translocation from upper to lower horizons. As water moves downward, it can carry small amounts of clay in suspension. This clay accumulates at depths penetrated by water. It accumulates in fine pores in the soil and as clay films on surfaces of peds. Over long periods of time, at least a few thousand years, such processes can result in distinct horizons. Spurger soils are examples of soils that have strongly developed Bt horizons. Labelle soils have a less developed Bt horizon. Labelle soils have clays with a high degree of shrink-swell, which destroys the clay films.

A B horizon that has distinct structure or color development with little or no evidence of clay accumulation is called a Bw horizon. Plant roots and other organisms contribute to the rearrangement of soil materials into secondary aggregates. Organic residues and secretions of organisms serve as cementing agents that help stabilize structural aggregates. Soils that have appreciable amounts of clay develop structural aggregates because of drying and wetting and because of shrinking and swelling.

Some soils in Hardin County have a high content of clay that has montmorillonite (smectite) as the dominant clay mineral. These soils shrink and develop wide, deep cracks when dry, and swell and become very plastic and cohesive when wet. Because of overburden pressure, soil movement, and stress caused by wetting and drying, a platy and wedge-like structure can form in the Bss horizon. Individual structural aggregates have distinct cleavage planes and polished faces known as slickensides. When the soil is dry, soil material from the surface often falls into the wide, deep cracks or is washed into the cracks by rain. When the soil is wet, lateral pressure caused by the swelling can result in surface heaving, which eventually leads to the formation of gilgai microrelief that consists of microhighs and microlows. Beaumont, League, and China soils have Bss horizons that have slickensides and gilgai microrelief.

The C horizon is relatively unchanged by soil-forming processes, although in some places it is modified by weathering. It is generally below the B horizon, although no soils have a C horizon below a B horizon in the Hardin County survey area. The C horizons are found in alluvial sediments near streams, rivers, and terraces. The C horizon is directly below the A horizon. McNeely, Turkey, and Votaw soils have C horizons directly below A horizons.

A horizon that is gray and shows evidence of reduction and segregation of iron compounds is designated by the addition of the symbol "g." Relatively long periods of wetness in poorly aerated horizons can reduce the amount of these iron compounds. In the more soluble, reduced form, appreciable amounts of iron can be translocated by water from one position to another within the soil. The presence of red, yellow, or brown mottles in predominantly gray horizons indicates segregation and local concentration of oxidized iron compounds as a result of oxidizing and reducing (wetting and drying) conditions in the soil. Evadale, Aris, and Camptown soils are examples of soils that have mottles in these colors.

Another important process in soil formation is the loss of components from the soil. Water can leach many soluble components, such as calcium carbonate, to the lower horizons in the profile. A horizon that has a significant accumulation of calcium carbonate is designated by the addition of the symbol "k." Levac soils are examples of soils that have accumulations of calcium carbonate in the lower horizons.

Surface Geology

Prepared by Saul Aronow, Professor Emeritus Department of Geology, Lamar University, Beaumont, Texas.

Hardin County is in the Western Gulf Coastal Plain geomorphic unit in which the surface geologic strata dip gulfward at low angles, less than 2 degrees, and crop out in Gulf-paralleling bands (17).

The county lies within the drainage basin of the Neches River, which forms the eastern margin of the county. The two major tributaries to the Neches River are Village Creek and Pine Island Bayou. A small part of northwestern Hardin County is drained by Menard Creek, a tributary to the Trinity River.

The surface geology of Hardin County is depicted on the Beaumont Sheet of the Geologic Atlas of Texas (3). The geologic strata fall into four major age categories. The oldest is the early to middle Pleistocene age Lissie Formation, deposited 125,000 to 2.5 million years Before Present (BP). The next oldest is the late Pleistocene Beaumont Formation which is younger than 125,000 years BP. Next in age are late Pleistocene fluviatile terrace deposits and the late Pleistocene to early Holocene Deweyville Formation. The youngest stratum in Hardin County is Holocene alluvium, which has been deposited within the last 10,000 years.

Lissie Formation

The Lissie Formation crops out in the central and northern parts of the county. The fluvial-deltaic depositional environment of the formation is inferred from the sediments and any relict fluvial topography that has been altered by time and erosional processes. The Lissie Formation outcrop is characterized by a general surface slope to the southeast of about 2.5 to 8.0 feet per mile. The slope increases and stream dissection increases in a northwestward direction. The outcrop surface also displays several topographic features such as pimple mounds and undrained depressions.

Soils formed in parent materials derived from the Lissie Formation are generally loamy throughout the sola. The general soil map units associated with the Lissie Formation are the Dallardsville-Sorter-Plank map unit and the Kirbyville-Waller-Otanya map unit.

The Lissie Formation outcrop in Hardin County is entirely within the Western Gulf Coast Flatwoods Major Land Resource Area.

Beaumont Formation

The Beaumont Formation crops out in the southern and western parts of the county. The fluvial deltaic origin of the formation displays a relict fluvial depositional topography of meandering streams with point bar remnants enclosed within the meander loops. These are located, in many places, on low meander ridges less than 10 feet high separated by lower floodbasin areas. Some of these relict meander-loop channels can be seen to the east, west, and south of Sour Lake. Many of these channels control the alignment of present-day intermittent streams. The Beaumont Formation outcrop is characterized by a southeasterly surface slope of about 1.2 to 4.0 feet per mile.

The soils that formed in the Beaumont Formation have loamy surfaces over clayey subsoils, or they are clayey throughout the sola. The general soil map units associated with the Beaumont Formation are the Evadale-Vamont-Texla map unit and the Aris-League-Labelle map unit.

The Beaumont Formation is within the Western Gulf Coast Flatwoods and the Gulf Coast Prairie Major Land Resource Areas.

Deweyville Formation and Other Fluviatile Terrace Deposits

The Deweyville Formation is the substrate for the relict terrace located on the west side of the Neches River flood plain in Hardin County. Similar unnamed late Pleistocene age terrace deposits flank Village Creek and its tributaries (3). The Deweyville Formation and these unnamed late Pleistocene fluvial deposits lack surface continuity; however, they are probably correlative.

The surface of the Deweyville Formation displays relict channel widths, meander radii, and meander scars much larger than those of the subjacent Holocene flood plain along the Neches River. The larger fluvial features indicate a higher discharge for the paleo-Neches River; which suggests different climatic conditions in east Texas during the late Pleistocene and early Holocene times.

Soils that formed on the relict terraces of the Deweyville Formation and unnamed fluviatile deposits are generally sandy or loamy throughout with the exception of the Spurger series, which has a clayey subsoil. The general soil map unit associated with these terraces is the Belrose-Votaw-Caneyhead map unit.

The relict terraces in Hardin County are entirely within the Western Gulf Coast Flatwoods Major Land Resource Area.

Holocene Alluvium

Holocene age alluvium covers the flood plains of the Neches River and its major tributaries (3). These flood plains are graded to present-day sea level. A unique feature on the Neches River flood plain is a braided network of shallow intermittent stream channels. Most of these channels are less than 200 feet wide and less than 5 feet deep.

Soils are loamy in the shallow intermittent channels and clayey between the channels. Soils in the southern part of the county on flood plains of Pine Island Bayou and Little Pine Island Bayou are similar to those on the Neches River flood plain. Soils are loamy throughout the sola along Village Creek, Turkey Creek, and Beech Creek in the northern part of the county. The general soil map units associated with the Holocene alluvium are the Estes-Angelina-Spurger map unit and the Belrose-Bleakwood-Iulus map unit.

The Holocene age alluvium in Hardin County is entirely within the Western Gulf Coast Flatwoods Major Land Resource Area.

References

(1) American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.

(2) American Society for Testing and Materials (ASTM). 1993. Standard classification of soils for engineering purposes. ASTM Standard D 2487-00.

(3) Barnes, V.E. 1992. Geologic Atlas Sheet of Texas, Beaumont sheet (second edition). Bureau of Economic Geology, University of Texas at Austin, Austin, Texas.

(4) Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

(5) Federal Register. July 13, 1994. Changes in hydric soils of the United States.

(6) Federal Register. February 24, 1995. Hydric soils of the United States.

(7) Hurt, G.W., P.M. Whited, and R.F. Pringle, editors. Version 4.0, 1998. Field indicators of hydric soils in the United States.

(8) National Research Council. 1995. Wetlands: Characteristics and boundaries.

(9) Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

(10) Soil Survey Staff. 1998. Keys to soil taxonomy. 8th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

(11) Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

(12) Schaadt, Robert L. 1991. The History of Hardin County, Texas.

(13) Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

(14) United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

(15) United States Department of Agriculture, Natural Resources Conservation Service. 1996. Soil survey laboratory methods manual. Soil Survey Investigations Report 42.

(16) United States Department of Agriculture, Soil Conservation Service, 1981. Land resource regions and major land resource areas of the United States. U.S. Department of Agriculture Handbook 296.

(17) Walker, H.J. and Coleman, J.M. 1997. Atlantic and Gulf Coastal Plain, *in* Graf, W.L., editor, Geomorphic Systems of North America, Centennial Special Vol. 2: Boulder, Geological Society of America, pp. 51-110.

Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" (available in local offices of the Natural Resources Conservation Service or on the Internet).

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soils have air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl. A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction toward which a slope faces. Also called slope aspect.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle part of a hill slope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp. A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology). A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane. A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bioturbation. The churning and stirring of a sediment by organisms. (The Glossary of Geology)

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. An informal term loosely applied to various parts of a flood plain.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. See Redoximorphic features.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A dense, compact, slowly permeable subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are compounds making up concretions. See Redoximorphic features.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Coppice dune. See Shrub-coppice dune.

Corrosion (geomorphology). A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.
Cropping system. Growing crops according to a planned system of rotation and management practices.
Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.
Crown. The upper part of a tree or shrub, including the living branches and their foliage.
Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.
Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.
Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.
Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.
Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.
Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.
Diatomaceous earth. A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.
Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.
Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.
Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."
Drainage, surface. Runoff, or surface flow of water, from an area.
Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.
Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.
Dune. A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.
Earthy fill. See Mine spoil.
Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit. Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion surface. A land surface shaped by the action of erosion, especially by running water.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant. A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

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

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called normal field capacity, normal moisture capacity, or capillary capacity.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms. A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.
Flood-plain splay. A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.
Flood-plain step. An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.
Fluvial. Of or pertaining to rivers or streams; produced by stream or river action.
Footslope. The concave surface at the base of a hill slope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).
Forb. Any herbaceous plant not a grass or a sedge.
Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.
Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.
Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.
Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
Gilgai. Commonly, a succession of microlows (microbasins) and microhighs (microknolls) in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell changes considerably with changes in moisture content.
Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
Graded stripcropping. Growing crops in strips that grade toward a protected waterway.
Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
Ground water. Water filling all the unblocked pores of the material below the water table.
Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.
Head slope (geomorphology). A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.
Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.
High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology). A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hill slopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream. A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. See Redoximorphic features.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Krotovina. Irregular tubular streaks within one layer of material transported from another layer by filling of tunnels made by burrowing animals with material from outside the layer in which they are found. (The Glossary of Geology.)

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength. The soil is not strong enough to support loads.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. See Redoximorphic features.

Meander belt. The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar. A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll. One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mine spoil. An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. A kind of map unit that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—few, common, and many; size—fine, medium, and coarse; and contrast—faint, distinct, and prominent. The size measurements are of the diameter along the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

Mounds. (a) A low, rounded natural hill of unspecified origin, generally < 3 m high and, composed of earthy material; (b) A small, human-made hill, composed either of debris accumulated during successive occupations of the site (e.g., tell) or of earth heaped up to mark a burial site (e.g., burial mound). (c) A structure built by colonial organisms (e.g., termite mound).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. See Redoximorphic features.

Nose slope (geomorphology). A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Paleoterrace. An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, hardpan, fragipan, claypan, plowpan, and traffic pan.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A layer of sediment, eroded from the shoulder and back slope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piezometer. A slotted pipe, usually PVC, place at varying depths, used to measure the level of a seasonal high water table. Measurements done usually every two weeks, for at least a year during the wet-dry-wet season.

Pimple mound. (colloquial: Gulf Coast U.S.A.) Low, flattened, approximately circular or elliptical features composed of sandy loam that is coarser than, and distinct from, the surrounding soil; the basal diameter ranges from 3 m to more than 30 m, and the height from 30 cm to more than 2 m. Compare—mima mound, patterned ground, shrub-coppice dune.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings. See Redoximorphic features.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

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

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; and
   B. Masses, which are noncemented concentrations of substances within the soil matrix; and
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; and
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletons).
3. Reduced matrix.—This is a soil matrix that has low chroma in situ but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (K_{sat}). See Permeability.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sedimentary rock. A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

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

Shoulder. The convex, erosional surface near the top of a hill slope. A shoulder is a transition from summit to back slope.

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

Shrub-coppice dune. A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and co-dominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 1 percent
Very gently sloping	1 to 3 percent
Gently sloping	3 to 5 percent
Moderately sloping	5 to 8 percent
Strongly sloping	8 to 12 percent

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to Ca^{++} + Mg^{++}. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Strath terrace. A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

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

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. See Underlying material.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hill slope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talf (geomorphology). A geomorphic component of flat plains (e.g., lake plain, low coastal plain, low-gradient till plain) consisting of an essentially flat (e.g., 0-1 percent slopes) and broad area dominated by closed depressions and a non-integrated or poorly integrated drainage system. Precipitation tends to pond locally and lateral transport is slow both above and below ground, which favors the accumulation of soil organic matter and a retention of fine earth sediments; better drained soils are commonly adjacent to drainageways. Compare—riser.

Terrace (geomorphology). A steplike surface, bordering a valley floor or shoreline that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terrace risers (geomorphology). A geomorphic component of terraces, flood-plain steps, and other stepped landforms consisting of the vertical or steep side slope (e.g., escarpment) typically of minimal aerial extent. Commonly a recurring part of a series of natural, step-like landforms such as successive stream terraces. It's characteristic shape and alluvial sediment composition are derived from the cut and fill processes of a fluvial system. Compare—tread.

Terrace treads (geomorphology). A geomorphic component of terraces, flood-plain steps, and other stepped landforms consisting of the flat to gently sloping, topmost and laterally extensive slope. Commonly a recurring part of a series of natural, step-like landforms such as successive stream terraces. It's characteristic shape and alluvial sediment composition is derived from the cut and fill processes of a fluvial system. Compare—riser.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The gently inclined surface at the base of a hill slope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hill slope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Upland. An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hill slope continuum.

Underlying material. The part of the soil below the solum.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded for the period 1971-2000 at Liberty, TX)

Month	Temperature: Average daily maximum	Temperature: Average daily minimum	Temperature: Average	Temperature: 2 years in 10 will have Maximum temperature higher than	Temperature: 2 years in 10 will have Minimum temperature lower than	Temperature: Average number of growing degree days*	Precipitation: Average	Precipitation: 2 years in 10 will have Less than	Precipitation: 2 years in 10 will have More than	Precipitation: Average number of days with 0.10 inch or more	Precipitation: Average total snow fall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January---	61.6	40.8	51.2	81	21	143	4.90	2.01	7.63	7	0.2
February--	65.6	43.9	54.8	83	24	190	3.76	1.83	5.32	5	0.0
March-----	72.6	50.6	61.6	87	29	366	3.83	1.74	5.68	5	0.0
April-----	78.3	56.9	67.6	90	38	528	4.01	0.93	7.16	4	0.0
May-------	85.0	64.9	74.9	94	49	770	5.80	2.32	9.15	5	0.0
June------	90.3	70.9	80.6	98	59	909	6.88	3.18	9.89	7	0.0
July------	93.3	73.2	83.2	100	66	1,021	4.46	2.09	6.34	6	0.0
August----	93.5	72.5	83.0	101	64	1,013	4.33	2.40	5.94	6	0.0
September-	89.1	67.7	78.4	99	50	850	5.95	2.34	9.02	7	0.0
October---	81.4	57.7	69.6	93	38	601	5.65	1.45	9.65	5	0.0
November--	71.4	48.8	60.1	87	28	323	5.95	2.36	9.04	6	0.0
December--	63.9	42.6	53.3	81	21	176	5.01	2.83	6.99	6	0.0
Yearly:											
Average---	78.8	57.5	68.2								
Extreme---	107	7		101	17						
Total----						6,890	60.52	47.36	71.01	69	0.2

Average number of days per year with at least 1 inch of snow on the ground: 0

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area. (Threshold: 50.0 degrees F.)

Table 2.--Freeze Dates in Spring and Fall

(Recorded for the period 1971-2000 at Liberty, TX)

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	February 15	March 5	March 22
2 years in 10 later than--	February 2	February 21	March 11
5 years in 10 later than--	January 1	January 24	February 18
First freezing temperature in fall:			
1 year in 10 earlier than--	December 13	November 21	November 7
2 years in 10 earlier than--	December 23	December 1	November 15
5 years in 10 earlier than--	January 20	December 23	November 29

Table 3.--Growing Season

(Recorded for the period 1971-2000 at Liberty, TX)

Probability	Daily minimum temperature during growing season		
	Number of days higher than 24°F	Number of days higher than 28°F	Number of days higher than 32°F
9 years in 10	320	286	242
8 years in 10	336	302	258
5 years in 10	> 365	339	287
2 years in 10	> 365	> 365	316
1 year in 10	> 365	> 365	331

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AnA	Anahuac-Aris complex, 0 to 1 percent slopes	2,237	0.4
ArA	Aris-Levac complex, 0 to 1 percent slopes	6,325	1.1
AsA	Aris-Spindletop complex, 0 to 1 percent slopes	15,552	2.7
BaA	Batson very fine sandy loam, 0 to 1 percent slopes	2,516	0.4
BeA	Beaumont clay, 0 to 1 percent slopes	5,843	1.0
BoB	Belrose loamy very fine sand, 1 to 3 percent slopes	17,794	3.1
BrA	Belrose-Caneyhead complex, 0 to 1 percent slopes	9,800	1.7
BvA	Bevil clay, 0 to 1 percent slopes	5,712	1.0
CaA	Camptown silt loam, 0 to 1 percent slopes	2,533	0.4
CbA	Camptown-Batson complex, 0 to 1 percent slopes	3,053	0.5
CyA	Cypress mucky clay, 0 to 1 percent slopes, frequently flooded	3,620	0.6
DAM	Dam	14	*
EsA	Estes clay, 0 to 1 percent slopes, frequently flooded	794	0.1
EtA	Estes-Angelina complex, 0 to 1 percent slopes, frequently flooded	26,992	4.7
EvA	Evadale silt loam, 0 to 1 percent slopes	6,743	1.2
EwA	Evadale-Gist complex, 0 to 1 percent slopes	15,580	2.7
ExA	Evadale-Texla complex, 0 to 1 percent slopes	28,997	5.0
IbA	Iulus-Bleakwood complex, 0 to 1 percent slopes, frequently flooded	24,072	4.2
JaA	Jasco silt loam, 0 to 1 percent slopes	1,528	0.3
JhA	Jayhawker silt loam, 0 to 1 percent slopes	14,250	2.5
KeB	Kenefick fine sandy loam, 1 to 3 percent slopes	2,107	0.4
KfA	Kenefick-Caneyhead complex, 0 to 1 percent slopes	15,941	2.8
KrB	Kirbyville very fine sandy loam, 0 to 2 percent slopes	32,690	5.7
KwA	Kirbyville-Niwana complex, 0 to 1 percent slopes	10,338	1.8
KzB	Kountze very fine sandy loam, 0 to 2 percent slopes	17,589	3.1
LdA	Labelle-Levac complex, 0 to 1 percent slopes	2,324	0.4
LsA	Labelle-Spindletop complex, 0 to 1 percent slopes	2,820	0.5
LtA	League clay, 0 to 1 percent slopes	7,974	1.4
LvA	Lelavale loam, 0 to 1 percent slopes	1,164	0.2
LwA	Leton silt loam, 0 to 1 percent slopes	2,344	0.4
MaA	Manco loam, 0 to 1 percent slopes, frequently flooded	7,875	1.4
McC	McNeely sand, 1 to 5 percent slopes	1,781	0.3
NdA	Nona-Dallardsville complex, 0 to 1 percent slopes	8,800	1.5
Oa	Oil-waste land	4,169	0.7
OeA	Olive silt loam, 0 to 1 percent slopes	9,034	1.6
OvA	Olive-Dallardsville complex, 0 to 1 percent slopes	16,834	2.9
OyB	Otanya fine sandy loam, 1 to 3 percent slopes	30,948	5.4
OyC	Otanya fine sandy loam, 3 to 5 percent slopes	6,472	1.1
PkA	Plank silt loam, 0 to 1 percent slopes	20,664	3.6
SbC	Silsbee fine sandy loam, 3 to 5 percent slopes	2,285	0.4
SbD	Silsbee fine sandy loam, 5 to 12 percent slopes	5,838	1.0
SdA	Sorter-Dallardsville complex, 0 to 1 percent slopes	94,138	16.4
SpB	Spurger very fine sandy loam, 0 to 2 percent slopes	5,962	1.0
TuB	Turkey sand, 1 to 3 percent slopes	4,595	0.8
TyA	Tyden-Babco complex, 0 to 1 percent slopes	4,847	0.8
VaA	Vamont clay, 0 to 1 percent slopes	17,813	3.1
VoA	Votaw fine sand, 0 to 1 percent slopes	10,984	1.9
W	Water	2,128	0.4
WdA	Waller-Dallardsville complex, 0 to 1 percent slopes	30,589	5.3
	Total	575,002	100.0

* Less than 0.1 percent.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability		Bahiagrass		Common bermudagrass		Improved bermudagrass		Rice		Soybeans	
	N	I	N	I	N	I	N	I	N	I	N	I
			AUM	AUM	AUM	AUM	AUM	AUM	Bu	Bu	Bu	Bu
AnA:			8.00	---	---	---	10.00	---	---	120.00	30.00	---
Anahuac------------	2w	2w										
Aris---------------	4w	4w										
ArA:			---	---	6.50	---	10.00	---	---	130.00	30.00	---
Aris---------------	4w	4w										
Levac--------------	3w	3w										
AsA:			---	---	6.50	---	10.00	---	---	130.00	30.00	---
Aris---------------	4w	4w										
Spindletop---------	2w	---										
BaA:			---	---	---	---	---	---	---	---	---	---
Batson-------------	1w	---										
BeA:			---	---	---	---	---	---	---	120.00	---	---
Beaumont-----------	4w	4w										
BoB:			---	---	---	---	---	---	---	---	---	---
Belrose------------	2w	---										
BrA:			---	---	---	---	---	---	---	---	---	---
Belrose------------	2w	---										
Caneyhead----------	4w	---										
BvA:			---	---	---	---	---	---	---	120.00	---	---
Bevil--------------	4w	4w										
CaA:			---	---	---	---	---	---	---	---	---	---
Camptown-----------	7w	---										
CbA:			---	---	---	---	---	---	---	---	---	---
Camptown-----------	7w	---										
Batson-------------	1w	---										
CyA:			---	---	---	---	---	---	---	---	---	---
Cypress------------	8w	---										
DAM:			---	---	---	---	---	---	---	---	---	---
Dam----------------	---	---										

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Bahiagrass N	Bahiagrass I	Common bermudagrass N	Common bermudagrass I	Improved bermudagrass N	Improved bermudagrass I	Rice N	Rice I	Soybeans N	Soybeans I
			AUM	AUM	AUM	AUM	AUM	AUM	Bu	Bu	Bu	Bu
EsA:			2.50	---	2.00	---	---	---	---	---	---	---
Estes	5w	---										
EtA:			---	---	---	---	---	---	---	---	---	---
Estes	5w	---										
Angelina	6w	---										
EvA:			5.00	---	4.00	---	---	---	---	---	---	---
Evadale	4w	---										
EwA:			5.00	---	4.00	---	---	---	---	---	---	---
Evadale	4w	---										
Gist	2w	---										
ExA:			5.00	---	4.00	---	---	---	---	---	---	---
Evadale	4w	---										
Texla	3w	---										
IbA:			---	---	---	---	---	---	---	---	---	---
Iulus	5w	---										
Bleakwood	5w	---										
JaA:			---	---	---	---	---	---	---	---	---	---
Jasco	6w	---										
JhA:			---	---	---	---	---	---	---	---	---	---
Jayhawker	4w	---										
KeB:			8.00	---	8.00	---	10.00	---	---	---	30.00	---
Kenefick	2e	---										
KfA:			---	---	---	---	---	---	---	---	---	---
Kenefick	2e	---										
Caneyhead	4w	---										
KrB:			6.00	---	6.00	---	8.00	---	---	---	---	---
Kirbyville	2w	---										
KwA:			6.00	---	6.00	---	8.00	---	---	---	---	---
Kirbyville	2w	---										
Niwana	2w	---										
KzB:			---	---	---	---	---	---	---	---	---	---
Kountze	2w	---										

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Bahiagrass		Common bermudagrass		Improved bermudagrass		Rice		Soybeans	
	N	I	N	I	N	I	N	I	N	I	N	I
			AUM	AUM	AUM	AUM	AUM	AUM	Bu	Bu	Bu	Bu
LdA:			4.50	---	4.50	---	---	---	---	110.00	---	---
Labelle------------	3w	3w										
Levac--------------	3w	3w										
LsA:			4.50	---	4.50	---	---	---	---	110.00	---	---
Labelle------------	3w	3w										
Spindletop---------	2w	---										
LtA:			---	---	---	---	---	---	---	110.00	---	---
League-------------	3w	3w										
LvA:			---	---	---	---	---	---	---	---	---	---
Lelavale-----------	6w	---										
LwA:			5.50	---	5.00	---	---	---	---	---	---	---
Leton--------------	5w	---										
MaA:			2.00	---	2.00	---	---	---	---	---	---	---
Manco--------------	5w	---										
McC:			---	---	---	---	---	---	---	---	---	---
McNeely------------	4s	---										
NdA:			---	---	---	---	---	---	---	---	---	---
Nona---------------	7w	---										
Dallardsville------	2w	---										
Oa:			---	---	---	---	---	---	---	---	---	---
Oil-waste land-----	8s	---										
OeA:			---	---	---	---	---	---	---	---	---	---
Olive--------------	6w	---										
OvA:			---	---	---	---	---	---	---	---	---	---
Olive--------------	6w	---										
Dallardsville------	2w	---										
OyB:			8.00	---	7.00	---	10.00	---	---	---	---	---
Otanya-------------	2e	---										
OyC:			6.00	---	6.00	---	9.00	---	---	---	---	---
Otanya-------------	2e	---										

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Bahiagrass N	Bahiagrass I	Common bermudagrass N	Common bermudagrass I	Improved bermudagrass N	Improved bermudagrass I	Rice N	Rice I	Soybeans N	Soybeans I
			AUM	AUM	AUM	AUM	AUM	AUM	Bu	Bu	Bu	Bu
PkA:			4.00	---	3.00	---	5.00	---	---	---	---	---
Plank--------------	4w	---										
SbC:			---	---	---	---	---	---	---	---	---	---
Silsbee------------	4e	---										
SbD:			---	---	---	---	---	---	---	---	---	---
Silsbee------------	4e	---										
SdA:			---	---	---	---	---	---	---	---	---	---
Sorter-------------	4w	---										
Dallardsville------	2w	---										
SpB:			---	---	5.00	---	8.00	---	---	---	---	---
Spurger------------	3e	---										
TuB:			---	---	---	---	---	---	---	---	---	---
Turkey-------------	4s	---										
TyA:			---	---	---	---	---	---	---	---	---	---
Tyden--------------	4w	---										
Babco--------------	3s	---										
VaA:			---	---	---	---	---	---	---	120.00	---	---
Vamont-------------	4w	4w										
VoA:			---	---	---	---	7.50	---	---	---	---	---
Votaw--------------	3w	---										
W:			---	---	---	---	---	---	---	---	---	---
Water--------------	---	---										
WdA:			6.00	---	5.00	---	7.00	---	---	100.00	---	---
Waller-------------	4w	---										
Dallardsville------	2w	---										

Table 6.--Prime Farmland

Map symbol	Soil name
AnA	Anahuac-Aris Complex, 0 to 1 percent slopes (prime farmland if drained)
ArA	Aris-Levac Complex, 0 to 1 percent slopes (prime farmland if drained)
AsA	Aris-Spindletop Complex, 0 to 1 percent slopes (prime farmland if drained)
BaA	Batson Very Fine Sandy Loam, 0 to 1 percent slopes
BeA	Beaumont Clay, 0 to 1 percent slopes (prime farmland if drained)
BoB	Belrose Loamy Very Fine Sand, 1 to 3 percent slopes
BrA	Belrose-Caneyhead Complex, 0 to 1 percent slopes (prime farmland if drained)
BvA	Bevil Clay, 0 to 1 percent slopes (prime farmland if drained)
CbA	Camptown-Batson Complex, 0 to 1 percent slopes (prime farmland if drained)
EvA	Evadale Silt Loam, 0 to 1 percent slopes (prime farmland if drained)
EwA	Evadale-Gist Complex, 0 to 1 percent slopes (prime farmland if drained)
ExA	Evadale-Texla Complex, 0 to 1 percent slopes (prime farmland if drained)
KeB	Kenefick Fine Sandy Loam, 1 to 3 percent slopes
KfA	Kenefick-Caneyhead Complex, 0 to 1 percent slopes (prime farmland if drained)
KrB	Kirbyville Very Fine Sandy Loam, 0 to 2 percent slopes
KwA	Kirbyville-Niwana Complex, 0 to 1 percent slopes
KzB	Kountze Very Fine Sandy Loam, 0 to 2 percent slopes
LdA	Labelle-Levac Complex, 0 to 1 percent slopes
LsA	Labelle-Spindletop Complex, 0 to 1 percent slopes
LtA	League Clay, 0 to 1 percent slopes
OyB	Otanya Fine Sandy Loam, 1 to 3 percent slopes
OyC	Otanya Fine Sandy Loam, 3 to 5 percent slopes
SpB	Spurger Very Fine Sandy Loam, 0 to 2 percent slopes
VaA	Vamont Clay, 0 to 1 percent slopes
WdA	Waller-Dallardsville Complex, 0 to 1 percent slopes (prime farmland if drained)

Table 7.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed)

Map symbol and soil name	Woodland Group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Suggested trees to plant
AnA:										
Anahuac	11	Slight	Slight	Slight	Slight	Slight	loblolly pine	90	330	loblolly pine
Aris	13	Slight	Moderate	Slight	Slight	Moderate	loblolly pine	90	330	loblolly pine, slash pine, sweetgum, water oak
							southern red oak	80	---	
							sweetgum	90	---	
ArA:										
Aris	13	Slight	Moderate	Slight	Slight	Moderate	loblolly pine	90	330	loblolly pine, slash pine, sweetgum, water oak
							southern red oak	80	---	
							sweetgum	90	---	
Levac	---	---	---	---	---	---	-----------------	---	---	---
AsA:										
Aris	13	Slight	Moderate	Slight	Slight	Moderate	loblolly pine	90	330	loblolly pine, slash pine, sweetgum, water oak
							southern red oak	80	---	
							sweetgum	90	---	
Spindletop	---	---	---	---	---	---	-----------------	---	---	---
BaA:										
Batson	2	Slight	Slight	Slight	Slight	Slight	loblolly pine	100	460	loblolly pine
BeA:										
Beaumont	13	Slight	Moderate	Moderate	Slight	Severe	loblolly pine	90	330	loblolly pine
BoB:										
Belrose	1	Slight	Slight	Slight	Slight	Slight	loblolly pine	100	460	loblolly pine
							longleaf pine	80		
BrA:										
Belrose	1	Slight	Slight	Slight	Slight	Slight	loblolly pine	100	460	loblolly pine
							longleaf pine	80		
Caneyhead	18	Slight	Severe	Severe	Slight	Severe	overcup oak	70	---	overcup oak

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Woodland Group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Suggested trees to plant
BvA:										
Bevil	12	Slight	Severe	Severe	Slight	Severe	loblolly pine	90	330	loblolly pine
							southern red oak	80	---	
							sweetgum	---	---	
							water oak	---	---	
CaA:										
Camptown	16	Slight	Severe	Severe	Slight	Severe	loblolly pine	80	250	slash pine,
							water oak	75	---	loblolly pine,
										water oak
CbA:										
Camptown	16	Slight	Severe	Severe	Slight	Severe	loblolly pine	80	250	slash pine,
							water oak	75	---	loblolly pine,
										water oak
Batson	2	Slight	Slight	Slight	Slight	Slight	loblolly pine	100	460	loblolly pine
CyA:										
Cypress	20	Slight	Severe	Severe	Severe	Severe	baldcypress	78	---	baldcypress
							red maple			
DAM:							tupelo			
Dam	---	---	---	---	---	---	------------------	---	---	---
EsA:										
Estes	8	Slight	Severe	Moderate	Slight	Moderate	green ash	---	---	American
							sweetgum	93	210	sycamore,
							water oak	93	---	loblolly pine,
							willow oak	86	---	sweetgum, water
										oak
EtA:										
Estes	8	Slight	Severe	Moderate	Slight	Moderate	green ash	---	---	American
							sweetgum	93	210	sycamore,
							water oak	93	---	loblolly pine,
							willow oak	86	---	sweetgum, water
										oak
Angelina	18	Slight	Severe	Severe	Slight	Severe	overcup oak	65	---	Overcup oak,
										Tupelo, red
EvA:										maple
Evadale	4	Slight	Severe	Moderate	Slight	Severe	loblolly pine	100	460	loblolly pine

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Wood-land Group	Management concerns: Erosion hazard	Management concerns: Equip-ment limita-tion	Management concerns: Seedling mortal-ity	Management concerns: Wind-throw hazard	Management concerns: Plant competi-tion	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Suggested trees to plant
EwA:										
Evadale	4	Slight	Severe	Moderate	Slight	Severe	loblolly pine	100	460	loblolly pine
Gist	1	Slight	Slight	Slight	Slight	Slight	loblolly pine	100	460	loblolly pine,
							longleaf pine	80		slash pine,
							slash pine	94	---	sweetgum
							sweetgum	---	---	
ExA:										
Evadale	4	Slight	Severe	Mdoerate	Slight	Severe	loblolly pine	90	460	loblolly pine
Texla	9	Slight	Moderate	Slight	Slight	Moderate	loblolly pine	90	330	loblolly pine
							longleaf pine	82	---	
IbA:										
Iulus	3	Slight	Slight	Slight	Slight	Slight	loblolly pine	102	460	loblolly pine,
							sweetgum	100	---	sweetgum
							water oak	100	---	
Bleakwood	5	Slight	Severe	Severe	Slight	Severe	loblolly pine	102	460	loblolly pine,
							sweetgum	90	---	sweetgum, water
							water oak	90	---	oak
							willow oak	90	---	
JaA:										
Jasco	19	Slight	Severe	Severe	Severe	Severe	loblolly pine	70	130	loblolly pine,
										slash pine
JhA:										
Jayhawker	16	Slight	Severe	Severe	Slight	Severe	loblolly pine	85	250	loblolly pine
KeB:										
Kenefick	1	Slight	Slight	Slight	Slight	Slight	loblolly pine	100	460	black walnut,
							longleaf pine	80	---	loblolly pine,
							shortleaf pine	85	---	southern red
							southern red oak	---	---	oak, sweetgum
							sweetgum	---	---	
KfA:										
Kenefick	1	Slight	Slight	Slight	Slight	Slight	loblolly pine	100	460	black walnut,
							longleaf pine	80	---	loblolly pine,
							shortleaf pine	85	---	southern red
							southern red oak	---	---	oak, sweetgum
							sweetgum	---	---	

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Wood-land Group	Management concerns: Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Wind-throw hazard	Plant competi-tion	Potential productivity: Common trees	Site index	Volume of wood fiber*	Suggested trees to plant
Caneyhead-------	18	Slight	Severe	Severe	Slight	Severe	overcup oak---------	70	---	overcup oak
KrB:										
Kirbyville------	2	Slight	Slight	Slight	Slight	Slight	loblolly pine-------	100	460	loblolly pine,
							longleaf pine-------	98	---	southern red
							shortleaf pine------	90	---	oak, sweetgum
KwA:										
Kirbyville------	2	Slight	Slight	Slight	Slight	Slight	loblolly pine-------	100	460	loblolly pine,
							longleaf pine-------	98	---	southern red
							shortleaf pine------	90	---	oak, sweetgum
Niwana----------	1	Slight	Slight	Slight	Slight	Slight	loblolly pine-------	96	460	loblolly pine,
							longleaf pine-------	80	---	slash pine,
							sweetgum------------	---	---	sweetgum
KzB:										
Kountze---------	2	Slight	Slight	Slight	Slight	Slight	loblolly pine-------	93	460	loblolly pine
LdA:										
Labelle---------	11	Slight	Slight	Moderate	Slight	Moderate	loblolly pine-------	90	330	loblolly pine
Levac-----------	---	---	---	---	---	---	------------------	---	---	---
LsA:										
Labelle---------	11	Slight	Slight	Moderate	Slight	Moderate	loblolly pine-------	90	330	loblolly pine
Spindletop------	---	---	---	---	---	---	------------------	---	---	---
LtA:										
League ---------	11	Slight	Slight	Moderate	Slight	Moderate	loblolly pine-------	90	330	loblolly pine
LvA:										
Lelavale--------	20	Slight	Severe	Severe	Slight	Severe	--------------------	---	---	---
LwA:										
Leton-----------	13	Slight	Severe	Severe	Slight	Severe	loblolly pine-------	90	330	loblolly pine
MaA:										
Manco-----------	5	Slight	Severe	Moderate	Slight	Moderate	loblolly pine	100	460	loblolly pine,
							water oak-----------	90	---	green ash
							willow oak----------	90	---	

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Wood-land Group	Management concerns: Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Wind-throw hazard	Plant competi-tion	Potential productivity: Common trees	Site index	Volume of wood fiber*	Suggested trees to plant
McC:										
Mcneely	14	Slight	Severe	Severe	Slight	Severe	loblolly pine	70	130	loblolly pine
							longleaf pine	---	---	
							shortleaf pine	---	---	
NdA:										
Nona	17	Slight	Severe	Severe	Slight	Severe	loblolly pine	80	230	water oak
Dallardsville	9	Slight	Moderate	Moderate	Slight	Moderate	loblolly pine	89	330	loblolly pine, sweetgum, water oak
							longleaf pine	82	---	
							shortleaf pine	70	---	
							southern red oak	---	---	
							sweetgum	90	---	
							water oak	90	---	
Oa:										
Oil-Waste Land	---	---	---	---	---	---	-----------------	---	---	---
OeA:										
Olive	12	Slight	Severe	Severe	Slight	Severe	loblolly pine	88	330	loblolly pine
OvA:										
Olive	12	Slight	Severe	Severe	Slight	Severe	loblolly pine	88	330	loblolly pine
Dallardsville	9	Slight	Moderate	Moderate	Slight	Moderate	loblolly pine	89	330	loblolly pine, sweetgum, water oak
							longleaf pine	80	---	
							shortleaf pine	70	---	
							southern red oak	---	---	
							sweetgum	90	---	
							water oak	90	---	
OyB:										
Otanya	6	Slight	Slight	Slight	Slight	Slight	loblolly pine	95	330	black walnut, loblolly pine, southern red oak, sweetgum
							longleaf pine	82	---	
							shortleaf pine	80	---	
							slash pine	94	---	
							sweetgum	---	---	
OyC:										
Otanya	6	Slight	Slight	Slight	Slight	Slight	loblolly pine	90	330	black walnut, loblolly pine, southern red oak, sweetgum
							longleaf pine	82	---	
							shortleaf pine	80	---	
							slash pine	94	---	
							sweetgum	---	---	

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Woodland Group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Suggested trees to plant
PkA:										
Plank	17	Slight	Severe	Severe	Slight	Moderate	loblolly pine	80	230	slash pine
SbC:										
Silsbee	6	Slight	Slight	Slight	Slight	Slight	loblolly pine	95	460	loblolly pine
SbD:										
Silsbee	6	Moderate	Slight	Slight	Slight	Slight	loblolly pine	90	460	loblolly pine
SdA:										
Sorter	16	Slight	Severe	Severe	Slight	Severe	loblolly pine	85	250	slash pine
							slash pine	90	---	loblolly pine
Dallardsville	9	Slight	Moderate	Moderate	Slight	Moderate	loblolly pine	89	330	loblolly pine,
							longleaf pine	82	---	sweetgum, water
							shortleaf pine	70	---	oak
							southern red oak	---	---	
							sweetgum	90	---	
							water oak	90	---	
SpB:										
Spurger	2	Slight	Moderate	Slight	Slight	Moderate	loblolly pine	101	460	loblolly pine,
							shortleaf pine	90	---	southern red
							southern red oak	90	---	oak, sweetgum
							sweetgum	100	---	
TuB:										
Turkey	14	Slight	Severe	Severe	Slight	Severe	loblolly pine	80	280	loblolly pine
TyA:										
Tyden	16	Slight	Severe	Severe	Slight	Severe	loblolly pine	75	250	loblolly pine
							slash pine	80	---	slash pine
Babco	15	Slight	Slight	Moderate	Slight	Moderate	loblolly pine	80	280	loblolly pine, slash pine

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Woodland Group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Suggested trees to plant
VaA:										
Vamont	10	Slight	Severe	Severe	Slight	Severe	loblolly pine	90	330	loblolly pine
							southern red oak	80	---	
							sweetgum	---	---	
							water oak	---	---	
VoA:										
Votaw	7	Slight	Moderate	Moderate	Slight	Slight	loblolly pine	90	330	loblolly pine,
							shortleaf pine	88	---	shortleaf pine
W:										
Water	---	---	---	---	---	---	-----------------	---	---	---
WdA:										
Waller	12	Slight	Severe	Severe	Slight	Severe	loblolly pine	90	330	loblolly pine
Dallardsville	9	Slight	Moderate	Moderate	Slight	Moderate	loblolly pine	89	330	loblolly pine,
							longleaf pine	82	---	sweetgum, water
							shortleaf pine	70	---	oak
							southern red oak	---	---	
							sweetgum	90	---	
							water oak	90	---	

* Yield in board feet (Doyle Rule) based on an unmanaged stand of loblolly pine over a 50-year period.

Table 8.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AnA:					
Anahuac	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Slight	Slight
Aris	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
ArA:					
Aris	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Levac	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
AsA:					
Aris	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Spindletop	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Moderate: wetness	Moderate: wetness
BaA:					
Batson	Slight: wetness	Slight: wetness	Slight: wetness	Slight: wetness	Slight: wetness
BeA:					
Beaumont	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness
BoB:					
Belrose	Slight: wetness	Moderate: wetness	Moderate: wetness	Severe: erodes easily wetness	Slight: wetness
BrA:					
Belrose	Slight: wetness	Moderate: wetness	Moderate: wetness	Severe: erodes easily wetness	Slight: wetness
Caneyhead	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
BvA:					
Bevil	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness
CaA:					
Camptown	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
CbA:					
Camptown	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Batson	Slight: wetness	Slight: wetness	Slight: wetness	Slight: wetness	Slight: wetness
CyA: Cypress	Severe: flooding percs slowly ponding	Severe: percs slowly ponding	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding
DAM: Dam	---	---	---	---	---
EsA: Estes	Severe: flooding percs slowly wetness	Severe: percs slowly too clayey wetness	Severe: flooding too clayey wetness	Severe: too clayey wetness	Severe: flooding too clayey wetness
EtA: Estes	Severe: flooding percs slowly wetness	Severe: percs slowly too clayey wetness	Severe: flooding too clayey wetness	Severe: too clayey wetness	Severe: flooding too clayey wetness
Angelina	Severe: flooding ponding	Severe: ponding	Severe: flooding ponding	Severe: ponding	Severe: flooding ponding
EvA: Evadale	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
EwA: Evadale	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Gist	Moderate: wetness	Moderate: wetness	Moderate: wetness	Slight	Slight
ExA: Evadale	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Texla	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
IbA: Iulus	Severe: flooding	Moderate: flooding wetness	Severe: flooding	Moderate: flooding wetness	Severe: flooding
Bleakwood	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness
JaA: Jasco	Severe: percs slowly too acid ponding	Severe: percs slowly too acid ponding	Severe: percs slowly too acid ponding	Severe: ponding	Severe: too acid ponding

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
JhA:					
Jayhawker	Severe: flooding ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
KeB:					
Kenefick	Slight	Slight	Slight	Slight	Slight
KfA:					
Kenefick	Slight	Slight	Slight	Slight	Slight
Caneyhead	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
KrB:					
Kirbyville	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness
KwA:					
Kirbyville	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness
Niwana	Slight	Slight	Slight	Slight	Slight
KzB:					
Kountze	Slight: percs slowly wetness	Slight: wetness	Slight: wetness	Slight: wetness	Slight: wetness
LdA:					
Labelle	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Levac	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
LsA:					
Labelle	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Spindletop	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Moderate: wetness	Moderate: wetness
LtA:					
League	Severe: percs slowly too clayey wetness	Severe: too clayey wetness too acid	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness too acid
LvA:					
Lelavale	Severe: wetness ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
LwA:					
Leton	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MaA:					
Manco	Severe: flooding wetness too acid	Severe: too acid	Severe: flooding wetness too acid	Moderate: flooding wetness	Severe: flooding too acid
McC:					
McNeely	Severe: too sandy too acid	Severe: too sandy too acid	Severe: too sandy too acid	Severe: too sandy	Severe: too acid droughty
NdA:					
Nona	Severe: too acid ponding	Severe: too acid ponding	Severe: too acid ponding	Severe: ponding	Severe: too acid ponding
Dallardsville	Slight: wetness	Slight: wetness	Slight: wetness	Severe: erodes easily	Moderate: droughty
Oa:					
Oil-waste land	Severe: excess salt	Severe: excess salt	Severe: excess salt	Slight	Severe: excess salt
OeA:					
Olive	Severe: wetness too acid ponding	Severe: percs slowly wetness too acid ponding	Severe: percs slowly wetness too acid ponding	Severe: wetness ponding	Severe: wetness too acid ponding
OvA:					
Olive	Severe: wetness too acid ponding	Severe: percs slowly wetness too acid ponding	Severe: percs slowly wetness too acid ponding	Severe: wetness ponding	Severe: wetness too acid ponding
Dallardsville	Slight: wetness	Slight: wetness	Slight: wetness	Severe: erodes easily	Moderate: droughty
OyB:					
Otanya	Slight: percs slowly	Slight: percs slowly	Moderate: slope	Slight	Slight
OyC:					
Otanya	Slight: percs slowly	Slight: percs slowly	Moderate: slope	Slight	Slight
PkA:					
Plank	Severe: flooding too acid ponding	Severe: too acid ponding	Severe: too acid ponding	Severe: ponding	Severe: too acid ponding
SbC:					
Silsbee	Slight	Slight	Moderate: slope	Slight	Slight
SbD:					
Silsbee	Moderate: slope	Moderate: slope	Severe: slope	Slight	Moderate: slope
SdA:					
Sorter	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Dallardsville	Slight: wetness	Slight: wetness	Slight: wetness	Severe: erodes easily	Moderate: droughty
SpB:					
Spurger	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Severe: erodes easily	Slight
TuB:					
Turkey	Severe: too sandy too acid	Severe: too sandy too acid	Severe: too sandy too acid	Severe: too sandy	Severe: too acid droughty
TyA:					
Tyden	Severe: wetness too acid ponding	Severe: percs slowly wetness too acid ponding	Severe: percs slowly wetness too acid ponding	Severe: wetness ponding	Severe: wetness too acid ponding
Babco	Severe: percs slowly	Severe: percs slowly	Moderate: percs slowly too sandy wetness	Moderate: too sandy	Slight: wetness
VaA:					
Vamont	Severe: percs slowly too clayey wetness	Severe: too clayey wetness too acid	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness too acid
VoA:					
Votaw	Severe: too sandy	Severe: too sandy	Severe: too sandy	Severe: too sandy	Moderate: droughty
W:					
Water	---	---	---	---	---
WdA:					
Waller	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Dallardsville	Slight: wetness	Slight: wetness	Slight: wetness	Severe: erodes easily	Moderate: droughty

Table 9.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
AnA:												
Anahuac	Fair	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair
Aris	Fair	Fair	Good	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
ArA:												
Aris	Fair	Fair	Good	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Levac	Fair	Good	Fair	---	---	Fair	Fair	Fair	Fair	---	Fair	Good
AsA:												
Aris	Fair	Fair	Good	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Spindletop	Good	Good	Good	---	---	Good	Poor	Poor	Good	Poor	Poor	Good
BaA:												
Batson	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good
BeA:												
Beaumont	Fair	Fair	Poor	Fair	Fair	---	Fair	Good	Fair	Fair	Fair	---
BoB:												
Belrose	Good	Good	Good	Good	Good	Good	Poor	Poor	---	Good	Poor	---
BrA:												
Belrose	Good	Good	Good	Good	Good	Good	Poor	Poor	---	Good	Poor	---
Caneyhead	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
BvA:												
Bevil	Fair	Fair	Poor	Fair	Fair	---	Fair	Good	Fair	Fair	Fair	---
CaA:												
Camptown	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
CbA:												
Camptown	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Batson	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good

Table 9.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
CyA:												
Cypress	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Good	Very poor	Very poor	Good	---
DAM:												
Dam	---	---	---	---	---	---	---	---	---	---	---	---
EsA:												
Estes	Very poor	Poor	Fair	Good	---	Fair	Fair	Fair	Poor	Fair	Fair	---
EtA:												
Estes	Very poor	Poor	Fair	Good	---	Fair	Fair	Fair	Poor	Fair	Fair	---
Angelina	Very poor	Very poor	Poor	Poor	Very poor	Poor	Good	Good	Very poor	Very poor	Good	---
EvA:												
Evadale	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
EwA:												
Evadale	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Gist	Good	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
ExA:												
Evadale	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Texla	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
IbA:												
Iulus	Poor	Fair	Fair	Good	Good	---	Poor	Poor	Fair	Good	Poor	---
Bleakwood	Poor	Fair	Fair	Good	---	---	Good	Fair	Fair	Good	Fair	---
JaA:												
Jasco	Very poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
JhA:												
Jayhawker	Poor	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good	---

Table 9.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
KeB:												
Kenefick	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
KfA:												
Kenefick	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
Caneyhead	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
KrB:												
Kirbyville	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
KwA:												
Kirbyville	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Niwana	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
KzB:												
Kountze	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
LdA:												
Labelle	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	---	Fair	Good
Levac	Fair	Good	Fair	---	---	Fair	Fair	Fair	Fair	---	Fair	Good
LsA:												
Labelle	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	---	Fair	Good
Spindletop	Good	Good	Good	---	---	Good	Poor	Poor	Good	Poor	Poor	Good
LtA:												
League	Fair	Fair	Fair	Good	---	Fair	Poor	Fair	Fair	---	Fair	Fair
LvA:												
Lelavale	Very poor	Poor	Poor	Very poor	Very poor	---	Good	Good	Poor	Very poor	Good	---
LwA:												
Leton	Poor	Fair	Fair	---	---	Fair	Good	Good	Fair	---	Good	Fair

Table 9.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
MaA:												
Manco	Poor	Fair	Fair	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
McC:												
McNeely	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
NdA:												
Nona	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Dallardsville	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
Oa:												
Oil-waste land	Very poor	Very poor	Very poor	---	---	Very poor	Very poor	Very poor	Very poor	---	Very poor	Very poor
OeA:												
Olive	Poor	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	---
OvA:												
Olive	Poor	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	---
Dallardsville	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
OyB:												
Otanya	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
OyC:												
Otanya	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
PkA:												
Plank	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
SbC:												
Silsbee	Fair	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Fair	Very poor	Good
SbD:												
Silsbee	Fair	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Fair	Very poor	Good

Table 9.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
SdA:												
Sorter	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Dallardsville	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
SpB:												
Spurger	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
TuB:												
Turkey	Poor	Poor	Fair	Fair	Fair	---	Very poor	Very poor	Poor	Poor	Very poor	Fair
TyA:												
Tyden	Very poor	Very poor	Poor	Poor	Poor	---	Good	Good	Very poor	Very poor	Good	Poor
Babco	Poor	Fair	Good	Fair	Fair	Good	Poor	Poor	Fair	Fair	Poor	---
VaA:												
Vamont	Fair	Fair	Poor	Fair	Fair	---	Fair	Good	Fair	Fair	Fair	---
VoA:												
Votaw	Poor	Fair	Good	Fair	Poor	Fair	Poor	Poor	Fair	Fair	Poor	---
W:												
Water	---	---	---	---	---	---	---	---	---	---	---	---
WdA:												
Waller	Poor	Fair	Fair	Good	Fair	---	Good	Good	Fair	Good	Good	---
Dallardsville	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---

Table 10.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AnA:						
Anahuac	Moderate: too clayey wetness	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
Aris	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
ArA:						
Aris	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
Levac	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
AsA:						
Aris	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
Spindletop	Severe: wetness	Moderate: wetness	Severe: shrink-swell wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness
BaA:						
Batson	Severe: wetness	Slight: wetness	Moderate: wetness	Moderate: wetness	Slight: wetness	Slight: wetness
BeA:						
Beaumont	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BoB:						
Belrose	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness	Slight: wetness
BrA:						
Belrose	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness	Slight: wetness
Caneyhead	Severe: ponding cutbanks cave	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
BvA:						
Bevil	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness
CaA:						
Camptown	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: low strength ponding	Severe: ponding
CbA:						
Camptown	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: low strength ponding	Severe: ponding
Batson	Severe: wetness	Slight: wetness	Moderate: wetness	Moderate: wetness	Slight: wetness	Slight: wetness
CyA:						
Cypress	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding low strength ponding	Severe: flooding ponding
DAM:						
Dam	---	---	---	---	---	---
EsA:						
Estes	Severe: wetness cutbanks cave	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: flooding too clayey wetness

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EtA:						
Estes	Severe: wetness cutbanks cave	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: flooding too clayey wetness
Angelina	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding
EvA:						
Evadale	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
EwA:						
Evadale	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
Gist	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness	Slight
ExA:						
Evadale	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
Texla	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
IbA:						
Iulus	Severe: wetness	Severe: flooding	Severe: flooding wetness	Severe: flooding	Severe: flooding	Severe: flooding
Bleakwood	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
JaA:						
Jasco	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: too acid ponding
JhA:						
Jayhawker	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: ponding	Severe: ponding
KeB:						
Kenefick	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: low strength shrink-swell	Slight
KfA:						
Kenefick	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: low strength shrink-swell	Slight
Caneyhead	Severe: ponding cutbanks cave	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
KrB:						
Kirbyville	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: low strength wetness	Moderate: wetness
KwA:						
Kirbyville	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: low strength wetness	Moderate: wetness
Niwana	Moderate: wetness	Slight	Moderate: wetness	Slight	Slight	Slight
KzB:						
Kountze	Moderate: wetness	Slight: wetness	Moderate: wetness	Slight: wetness	Slight: wetness	Slight: wetness
LdA:						
Labelle	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Levac	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
LsA:						
Labelle	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
Spindletop	Severe: wetness	Moderate: wetness	Severe: shrink-swell wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness
LtA:						
League	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness too acid
LvA:						
Lelavale	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
LwA:						
Leton	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: flooding wetness
MaA:						
Manco	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength	Severe: flooding too acid
McC:						
McNeely	Severe: cutbanks cave	Slight	Slight	Moderate: slope	Slight	Severe: too acid droughty
NdA:						
Nona	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: low strength ponding	Severe: too acid ponding

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Dallardsville	Moderate: wetness	Slight: wetness	Moderate: wetness	Slight: wetness	Slight: wetness	Moderate: droughty
Oa:						
Oil-Waste land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Severe: excess salt
OeA:						
Olive	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness too acid ponding
OvA:						
Olive	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness too acid ponding
Dallardsville	Moderate: wetness	Slight: wetness	Moderate: wetness	Slight: wetness	Slight: wetness	Moderate: droughty
OyB:						
Otanya	Moderate: wetness	Slight	Moderate: wetness	Slight	Slight	Slight
OyC:						
Otanya	Moderate: wetness	Slight	Moderate: wetness	Slight	Slight	Slight
PkA:						
Plank	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: ponding	Severe: too acid ponding
SbC:						
Silsbee	Slight	Slight	Slight: wetness	Moderate: slope	Slight	Slight
SbD:						
Silsbee	Slight	Slight	Slight: wetness	Moderate: slope	Slight	Moderate: slope
SdA:						
Sorter	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Dallardsville	Moderate: wetness	Slight: wetness	Moderate: wetness	Slight: wetness	Slight: wetness	Moderate: droughty
SpB:						
Spurger	Moderate: too clayey wetness	Moderate: shrink-swell	Moderate: shrink-swell wetness	Moderate: shrink-swell	Severe: low strength	Slight
TuB:						
Turkey	Severe: cutbanks cave	Slight	Slight	Moderate: slope	Slight	Severe: too acid droughty
TyA:						
Tyden	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness too acid ponding
Babco	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness	Slight: wetness
VaA:						
Vamont	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness too acid
VoA:						
Votaw	Severe: wetness cutbanks cave	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness	Moderate: droughty
W:						
Water	---	---	---	---	---	---
WdA:						
Waller	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Dallardsville	Moderate: wetness	Slight: wetness	Moderate: wetness	Slight: wetness	Slight: wetness	Moderate: droughty

Table 11.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AnA:					
Anahuac	Severe: percs slowly	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Severe: hard to pack too clayey
Aris	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
ArA:					
Aris	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
Levac	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
AsA:					
Aris	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
Spindletop	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Severe: hard to pack too clayey
BaA:					
Batson	Moderate: percs slowly	Severe: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness
BeA:					
Beaumont	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Severe: hard to pack too clayey wetness
BoB:					
Belrose	Severe: wetness	Severe: seepage wetness	Severe: seepage wetness	Severe: seepage wetness	Moderate: wetness
Caneyhead	Severe: percs slowly ponding	Severe: seepage ponding	Severe: seepage ponding	Severe: ponding	Severe: ponding
BrA:					
Belrose	Severe: wetness	Severe: seepage wetness	Severe: seepage wetness	Severe: seepage wetness	Moderate: wetness
Caneyhead	Severe: percs slowly ponding	Severe: seepage ponding	Severe: seepage ponding	Severe: ponding	Severe: ponding

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BvA:					
Bevil	Severe: percs slowly wetness	Severe: wetness ponding	Severe: too clayey wetness too acid	Severe: wetness	Severe: hard to pack too clayey wetness
CaA:					
Camptown	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
CbA:					
Camptown	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
Batson	Moderate: percs slowly	Severe: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness
CyA:					
Cypress	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Severe: hard to pack too clayey ponding
DAM:					
Dam	---	---	---	---	---
EsA:					
Estes	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Severe: hard to pack too clayey wetness
EtA:					
Estes	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Severe: hard to pack too clayey wetness
Angelina	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: ponding
EvA:					
Evadale	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
Camptown	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
EwA:					
Evadale	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
Gist	Severe: percs slowly wetness	Moderate: seepage	Moderate: wetness	Moderate: wetness	Moderate: thin layer wetness

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ExA:					
Evadale	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
Texla	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
IbA:					
Iulus	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding	Moderate: wetness
Bleakwood	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: wetness
JaA:					
Jasco	Severe: percs slowly ponding	Severe: ponding	Severe: too acid ponding	Severe: ponding	Poor: too acid ponding
JhA:					
Jayhawker	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
KeB:					
Kenefick	Moderate: percs slowly	Severe: seepage	Severe: seepage	Slight	Moderate: too clayey
KfA:					
Kenefick	Moderate: percs slowly	Severe: seepage	Severe: seepage	Slight	Moderate: too clayey
Caneyhead	Severe: percs slowly ponding	Severe: seepage ponding	Severe: seepage ponding	Severe: ponding	Severe: ponding
KrB:					
Kirbyville	Severe: wetness	Severe: seepage wetness	Severe: wetness	Moderate: wetness	Moderate: small stones too clayey wetness
KwA:					
Kirbyville	Severe: wetness	Severe: seepage wetness	Severe: wetness	Moderate: wetness	Moderate: small stones too clayey wetness
Niwana	Moderate: percs slowly wetness	Severe: seepage	Severe: seepage	Severe: seepage	Slight
KzB:					
Kountze	Moderate: wetness	Severe: seepage wetness	Moderate: wetness	Severe: seepage wetness	Slight

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LdA:					
Labelle	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
Levac	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
LsA:					
Labelle	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Severe: hard to pack too clayey wetness
Spindletop	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Severe: hard to pack too clayey
LtA:					
League	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Severe: hard to pack too clayey wetness
LvA:					
Lelavale	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: wetness ponding
LwA:					
Leton	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding wetness	Severe: flooding wetness	Severe: wetness
MaA:					
Manco	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness too acid	Severe: flooding wetness	Severe: wetness too acid
McC:					
McNeely	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Severe: seepage too sandy
NdA:					
Nona	Severe: percs slowly ponding	Severe: ponding	Severe: too acid ponding	Severe: ponding	Severe: too acid ponding
Dallardsville	Severe: percs slowly wetness	Severe: seepage wetness	Severe: seepage wetness	Severe: seepage wetness	Slight: wetness
Oa:					
Oil-waste land	Limitation: variable	Limitation: variable	Severe: excess salt	Limitation: variable	Severe: excess salt

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
OeA:					
Olive	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness too acid ponding
OvA:					
Olive	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness too acid ponding
Dallardsville	Severe: percs slowly wetness	Severe: seepage wetness	Severe: seepage wetness	Severe: seepage wetness	Slight: wetness
OyB:					
Otanya	Moderate: wetness	Slight: wetness	Slight	Slight	Slight
OyC:					
Otanya	Moderate: wetness	Slight: wetness	Slight	Slight	Slight
PkA:					
Plank	Severe: percs slowly ponding	Severe: ponding	Severe: too acid ponding	Severe: ponding	Severe: ponding
SbC:					
Silsbee	Slight	Moderate: slope	Slight	Slight	Slight
SbD:					
Silsbee	Slight	Moderate: slope	Slight	Slight	Slight
SdA:					
Sorter	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
Dallardsville	Severe: percs slowly wetness	Severe: seepage wetness	Severe: seepage wetness	Severe: seepage wetness	Slight: wetness
SpB:					
Spurger	Severe: percs slowly	Moderate: slope	Severe: seepage too clayey wetness	Slight	Severe: hard to pack too clayey
TuB:					
Turkey	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Severe: seepage too sandy
TyA:					
Tyden	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness ponding	Severe: wetness too acid ponding

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Babco	Severe: percs slowly, wetness	Severe: wetness	Moderate: too sandy, wetness	Moderate: wetness	Moderate: wetness
VaA: Vamont	Severe: percs slowly, wetness	Slight	Severe: too clayey, wetness, too acid	Severe: wetness	Severe: hard to pack, too clayey, wetness
VoA: Votaw	Severe: wetness, poor filter	Severe: seepage, wetness	Severe: seepage, too sandy, wetness	Severe: seepage	Severe: too sandy
W: Water	---	---	---	---	---
WdA: Waller	Severe: percs slowly, wetness	Moderate: seepage	Severe: wetness	Severe: wetness	Severe: wetness
Dallardsville	Severe: percs slowly, wetness	Severe: seepage, wetness	Severe: seepage, wetness	Severe: seepage, wetness	Slight: wetness

Table 12.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AnA:				
Anahuac	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Aris	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
ArA:				
Aris	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Levac	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
AsA:				
Aris	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Spindletop	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: thin layer
BaA:				
Batson	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Good
BeA:				
Beaumont	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
BoB:				
Belrose	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Fair: too sandy
BrA:				
Belrose	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Fair: too sandy
Caneyhead	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
BvA:				
Bevil	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
CaA:				
Camptown	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
CbA:				
Camptown	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
Batson	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Good
CyA:				
Cypress	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
DAM:				
Dam	---	---	---	---
EsA:				
Estes	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
EtA:				
Estes	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Angelina	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
EvA:				
Evadale	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
EwA:				
Evadale	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Gist	Fair: thin layer wetness	Improbable: excess fines	Improbable: excess fines	Good
ExA:				
Evadale	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Texla	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
IbA:				
Iulus	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Fair: small stones
Bleakwood	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
JaA:				
Jasco	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness too acid

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
JhA:				
Jayhawker	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
KeB:				
Kenefick	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
KfA:				
Kenefick	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Caneyhead	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
KrB:				
Kirbyville	Fair: low strength wetness	Improbable: excess fines	Improbable: excess fines	Fair: area reclaim small stones too clayey
KwA:				
Kirbyville	Fair: low strength wetness	Improbable: excess fines	Improbable: excess fines	Fair: area reclaim small stones too clayey
Niwana	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Good
KzB:				
Kountze	Good: wetness	Improbable: excess fines	Improbable: excess fines	Good
LdA:				
Labelle	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Levac	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
LsA:				
Labelle	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Spindletop	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: thin layer
LtA:				
League	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
LvA:				
Lelavale	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
LwA:				
Leton	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
MaA:				
Manco	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too acid
McC:				
McNeely	Good	Probable	Improbable: too sandy	Poor: too sandy too acid
NdA:				
Nona	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness too acid
Dallardsville	Slight: wetness	Improbable: excess fines	Improbable: excess fines	Good
Oa:				
Oil-waste land	Severe: area reclaim	Severe: excess fines	Severe: excess fines	Severe: excess salt
OeA:				
Olive	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness too acid
OvA:				
Olive	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness too acid
Dallardsville	Slight: wetness	Improbable: excess fines	Improbable: excess fines	Good
OyB:				
Otanya	Slight	Improbable: excess fines	Improbable: excess fines	Good
OyC:				
Otanya	Slight	Improbable: excess fines	Improbable: excess fines	Good
PkA:				
Plank	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
SbC:				
Silsbee	Good	Improbable: excess fines	Improbable: excess fines	Good
SbD:				
Silsbee	Good	Improbable: excess fines	Improbable: excess fines	Good
SdA:				
Sorter	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim wetness
Dallardsville	Slight: wetness	Improbable: excess fines	Improbable: excess fines	Good

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
SpB:				
Spurger	Good	Probable	Improbable: too sandy	Poor: too clayey
TuB:				
Turkey	Good	Probable	Improbable: too sandy	Poor: too sandy too acid
TyA:				
Tyden	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness too acid
Babco	Fair: wetness	Probable: not needed	Improbable: excess fines	Fair: too sandy
VaA:				
Vamont	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
VoA:				
Votaw	Fair: wetness	Probable	Improbable: excess fines	Poor: too sandy
W:				
Water	---	---	---	---
WdA:				
Waller	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
Dallardsville	Slight: wetness	Improbable: excess fines	Improbable: excess fines	Good

Table 13.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
AnA:							
Anahuac	Moderate: seepage	Severe: hard to pack	Severe: slow refill	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Aris	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly wetness
ArA:							
Aris	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly wetness
Levac	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
AsA:							
Aris	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly wetness
Spindletop	Moderate: seepage	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
BaA:							
Batson	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily soil blowing	Limitation: soil blowing	Limitation: erodes easily
BeA:							
Beaumont	Slight	Severe: hard to pack wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
BoB:							
Belrose	Severe: seepage	Severe: piping wetness	Severe: no water cutbanks cave	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily wetness soil blowing	Favorable
BrA:							
Belrose	Severe: seepage	Severe: piping wetness	Severe: no water cutbanks cave	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily wetness soil blowing	Favorable
Caneyhead	Severe: seepage	Severe: ponding	Severe: no water	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness
BvA:							
Bevil	Slight	Severe: hard to pack wetness	Severe: slow refill	Limitation: percs slowly too acid	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
CaA:							
Camptown	Slight	Severe: ponding	Severe: no water	Limitation: percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness
CbA:							
Camptown	Slight	Severe: ponding	Severe: no water	Limitation: percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness
Batson	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily soil blowing	Limitation: soil blowing	Limitation: erodes easily
CyA:							
Cypress	Slight	Severe: ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
DAM:							
Dam	---	---	---	---	---	---	---
EsA:							
Estes	Slight	Severe: wetness	Severe: no water	Limitation: flooding percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
EtA:							
Estes	Slight	Severe: wetness	Severe: no water	Limitation: flooding percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
Angelina	Slight	Severe: ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness
EvA:							
Evadale	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
EwA:							
Evadale	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Gist	Moderate: seepage	Severe: piping	Severe: no water	Favorable	Limitation: percs slowly wetness soil blowing	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily
ExA:							
Evadale	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Texla	Moderate: seepage	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
IbA:							
Iulus	Moderate: seepage	Severe: piping	Severe: no water	Limitation: flooding	Limitation: erodes easily flooding wetness	Limitation: erodes easily wetness	Limitation: erodes easily
Bleakwood	Moderate: seepage	Severe: piping wetness	Moderate: slow refill	Limitation: flooding	Limitation: flooding wetness soil blowing	Limitation: wetness soil blowing	Limitation: wetness
JaA:							
Jasco	Moderate: seepage	Severe: piping ponding	Severe: no water	Limitation: percs slowly too acid ponding	Limitation: soil blowing ponding droughty	Limitation: erodes easily rooting depth ponding	Limitation: erodes easily wetness droughty
JhA:							
Jayhawker	Slight	Severe: piping ponding	Severe: no water	Limitation: ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily ponding	Limitation: erodes easily wetness
KeB:							
Kenefick	Moderate: seepage	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable
KfA:							
Kenefick	Moderate: seepage	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable
Caneyhead	Severe: seepage	Severe: ponding	Severe: no water	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
KrB:							
Kirbyville	Moderate: seepage	Moderate: piping wetness	Severe: no water	Favorable	Limitation: wetness soil blowing	Limitation: wetness soil blowing	Favorable
KwA:							
Kirbyville	Moderate: seepage	Moderate: piping wetness	Severe: no water	Favorable	Limitation: wetness soil blowing	Limitation: wetness soil blowing	Favorable
Niwana	Severe: seepage	Moderate: piping	Moderate: slow refill deep to water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable
KzB:							
Kountze	Severe: seepage	Severe: piping wetness	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily wetness soil blowing	Favorable
LdA:							
Labelle	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Levac	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
LsA:							
Labelle	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Spindletop	Moderate: seepage	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
LtA: League	Slight	Severe: hard to pack wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
LvA: Lelavale	Moderate: seepage	Severe: piping ponding	Severe: no water	Limitation: percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: percs slowly wetness ponding	Limitation: erodes easily percs slowly wetness
LwA: Leton	Moderate: seepage	Severe: wetness	Severe: slow refill	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
MaA: Manco	Moderate: seepage	Severe: wetness	Moderate: slow refill	Limitation: flooding too acid	Limitation: erodes easily flooding wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
McC: McNeely	Severe: seepage	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty
NdA: Nona	Slight	Severe: ponding	Severe: no water	Limitation: percs slowly too acid ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness
Dallardsville	Moderate: seepage	Severe: piping wetness	Severe: no water	Favorable	Limitation: erodes easily droughty	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily droughty
Oa: Oil-waste land	Limitation: variable	Severe: excess salt	Severe: no water	Limitation: deep to water	Limitation: excess salt	Limitation: variable	Limitation: excess salt

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
OeA:							
Olive	Moderate: cemented pan	Severe: wetness ponding	Severe: slow refill	Limitation: percs slowly too acid ponding	Limitation: percs slowly too acid ponding	Limitation: rooting depth wetness ponding	Limitation: percs slowly rooting depth wetness
OvA:							
Olive	Moderate: cemented pan	Severe: wetness ponding	Severe: slow refill	Limitation: percs slowly too acid ponding	Limitation: percs slowly too acid ponding	Limitation: rooting depth wetness ponding	Limitation: percs slowly rooting depth wetness
Dallardsville	Moderate: seepage	Severe: piping wetness	Severe: no water	Favorable	Limitation: erodes easily droughty	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily droughty
OyB:							
Otanya	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Favorable	Favorable	Favorable
OyC:							
Otanya	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Favorable	Favorable	Favorable
PkA:							
Plank	Slight	Severe: piping ponding	Severe: no water	Limitation: too acid ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily ponding	Limitation: erodes easily wetness
SbC:							
Silsbee	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Favorable
SbD:							
Silsbee	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Favorable
SdA:							
Sorter	Slight	Severe: piping ponding	Severe: no water	Limitation: percs slowly ponding	Limitation: percs slowly rooting depth ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily rooting depth wetness

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Dallardsville	Moderate: seepage	Severe: piping wetness	Severe: no water	Favorable	Limitation: erodes easily droughty	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily droughty
SpB:							
Spurger	Slight	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily percs slowly
TuB:							
Turkey	Severe: seepage	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty
TyA:							
Tyden	Moderate: cemented pan	Severe: wetness ponding	Severe: slow refill	Limitation: percs slowly too acid ponding	Limitation: percs slowly too acid ponding	Limitation: rooting depth wetness ponding	Limitation: percs slowly rooting depth wetness
Babco	Slight: seepage	Severe: seepage piping	Severe: cutbanks cave	Limitation: percs slowly	Limitation: fast intake percs slowly	Limitation: wetness	Limitation: percs slowly
VaA:							
Vamont	Slight	Severe: hard to pack wetness	Severe: slow refill	Limitation: percs slowly too acid	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
VoA:							
Votaw	Severe: seepage	Severe: seepage piping	Severe: cutbanks cave	Limitation: cutbanks cave	Limitation: fast intake soil blowing	Limitation: too sandy soil blowing	Favorable
W:							
Water	---	---	---	---	---	---	---

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
WdA:							
Waller	Moderate: seepage	Severe: piping wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Dallardsville	Moderate: seepage	Severe: piping	Severe: no water	Favorable	Limitation: erodes easily wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness

Table 14.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
AnA:												
Anahuac	0-8	Very fine sandy loam	CL-ML, ML	A-4	0	0	95-100	95-100	90-100	65-95	15-30	2-7
	8-19	Very fine sandy loam, silt loam	CL-ML, ML	A-4	0	0	95-100	95-100	90-100	65-95	15-30	2-7
	19-32	Very fine sandy loam, silt loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	90-100	65-95	15-30	2-7
	32-49	Clay	CH, CL	A-6, A-7-6	0	0	95-100	95-100	85-100	51-95	35-56	20-40
	49-72	Clay, clay loam	CH, CL	A-6, A-7-6	0	0	95-100	95-100	85-100	51-95	35-56	20-40
	72-80	Clay loam, clay	CH, CL	A-6, A-7-6	0	0	95-100	95-100	85-100	51-95	35-56	20-40
Aris	0-6	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	21-34	4-14
	6-15	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	21-34	4-14
	15-24	Silty clay loam	ML, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	30-43	4-14
	24-80	Clay loam, clay, silty clay loam	CH, CL	A-7-6	0	0	100	95-100	95-100	60-80	41-60	20-40
ArA:												
Aris	0-6	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	21-34	4-14
	6-15	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	21-34	4-14
	15-24	Silty clay loam	ML, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	30-43	4-14
	24-80	Clay loam, clay, silty clay loam	CH, CL	A-7-6	0	0	100	95-100	95-100	60-80	41-60	20-40
Levac	0-4	Silt loam	CL, CL-ML	A-6	0	0	100	100	85-100	60-90	28-35	9-15
	4-13	Silt loam, loam	CL, CL-ML	A-6	0	0	100	100	85-100	60-90	28-35	9-15
	13-17	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-95	35-43	15-21
	17-72	Silty clay, clay	CH, CL	A-7-6	0	0	90-100	90-100	80-100	80-95	44-57	22-32
	72-80	Clay, silty clay	CH, CL	A-7-6	0	0	90-100	90-100	80-100	80-95	44-57	22-32

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
AsA:												
Aris------------	0-6	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	21-34	4-14
	6-15	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	21-34	4-14
	15-24	Silty clay loam	ML, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	30-43	4-14
	24-80	Clay loam, clay, silty clay loam	CH, CL	A-7-6	0	0	100	95-100	95-100	60-80	41-60	20-40
Spindletop------	0-10	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	75-85	15-35	NP-12
	10-21	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	75-85	15-35	NP-12
	21-26	Silty clay loam, silt loam	CH, CL	A-7-6, A-6	0	0	100	100	95-100	85-95	46-56	25-33
	26-34	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	90-95	52-60	28-35
	34-80	Silty clay, clay	CH	A-7-6	0	0	100	100	95-100	90-95	52-60	28-35
BaA:												
Batson----------	0-6	Very fine sandy loam	ML, SC-SM	A-4	0	0	95-100	95-100	95-100	45-75	5-10	NP-8
	6-29	Very fine sandy loam, fine sandy loam	ML, SC-SM	A-4	0	0	95-100	95-100	95-100	45-75	5-16	NP-8
	29-35	Very fine sandy loam, fine sandy loam	SC-SM, ML	A-4	0	0	95-100	95-100	95-100	45-75	5-16	NP-8
	35-55	Sandy clay loam, very fine sandy loam, loam	CL, SC	A-4, A-6	0	0	95-100	95-100	95-100	55-75	10-27	8-25
	55-80	Very fine sandy loam, sandy clay loam, clay loam	CL, SC	A-4, A-6	0	0	95-100	95-100	95-100	55-75	16-42	8-25
BeA:												
Beaumont--------	0-15	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	15-38	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	38-55	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	75-90	50-65
	55-80	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	75-90	50-65

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BoB:												
Belrose---------	0-5	Loamy very fine sand	SM	A-4	0	0	95-100	95-100	95-100	35-55	2-16	NP-3
	5-20	Loamy very fine sand, fine sandy loam	SM	A-4	0	0	95-100	95-100	95-100	35-55	2-16	NP-3
	20-44	Loamy very fine sand, fine sandy loam	SM	A-4	0	0	95-100	95-100	95-100	35-55	2-16	NP-3
	44-63	Loamy very fine sand, fine sandy loam	SM	A-4	0	0	95-100	95-100	95-100	40-55	2-21	NP-6
	63-75	Very fine sandy loam, fine sandy loam, loam	SM, CL, CL-ML	A-4	0	0	95-100	95-100	95-100	40-55	10-30	NP-11
	75-80	Loamy fine sand, fine sandy loam	SM	A-4	0	0	95-100	95-100	95-100	35-55	10-23	NP-7
BrA:												
Belrose---------	0-5	Loamy very fine sand	SM	A-4	0	0	95-100	95-100	95-100	35-55	2-16	NP-3
	5-20	Loamy very fine sand, fine sandy loam	SM	A-4	0	0	95-100	95-100	95-100	35-55	2-16	NP-3
	20-44	Loamy very fine sand, fine sandy loam	SM	A-4	0	0	95-100	95-100	95-100	35-55	2-16	NP-3
	44-63	Loamy very fine sand, fine sandy loam	SM	A-4	0	0	95-100	95-100	95-100	40-55	2-21	NP-6
	63-75	Very fine sandy loam, fine sandy loam, loam	ML, SM, CL	A-4	0	0	95-100	95-100	95-100	40-55	10-30	NP-11
	75-80	Loamy fine sand, fine sandy loam	SM	A-4	0	0	95-100	95-100	95-100	35-55	10-23	NP-7

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Caneyhead-------	0-4	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	75-90	16-23	3-7
	4-18	Silt loam, loam, very fine sandy loam	CL-ML, SC-SM	A-4	0	0	100	95-100	95-100	75-90	16-25	3-7
	18-29	Silt loam, silty clay loam, clay loam, loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	95-100	75-90	23-34	7-13
	29-63	Clay loam, silt loam, silty clay loam, loam	CL-ML, CL	A-6, A-4	0	0	100	95-100	95-100	75-90	25-38	8-15
	63-80	Silt loam, very fine sandy loam	ML, SC-SM	A-4	0	0	95-100	95-100	95-100	50-75	21-25	3-10
BvA:												
Bevil-----------	0-4	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	4-10	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	10-22	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	22-37	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	37-80	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	75-90	50-65
CaA:												
Camptown--------	0-4	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	70-98	14-23	NP-7
	4-13	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	70-98	14-23	NP-7
	13-46	Loam, silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	70-98	14-23	NP-7
	46-69	Loam, clay loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	70-98	19-38	19-38
	69-80	Clay loam, clay, silty clay	CH, CL	A-6, A-7	0	0	100	100	95-100	75-98	23-48	23-48

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
CbA:												
Camptown--------	0-4	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	70-98	14-23	NP-7
	4-13	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	70-98	14-23	NP-7
	13-46	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	70-98	14-23	NP-7
	46-69	Loam, clay loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	70-98	19-38	19-38
	69-80	Clay loam, clay, silty clay	CL, CH	A-6, A-7	0	0	100	100	95-100	75-98	23-48	23-48
Batson----------	0-6	Very fine sandy loam	ML, SC-SM	A-4	0	0	95-100	95-100	95-100	45-75	5-10	NP-8
	6-29	Very fine sandy loam, fine sandy loam	ML, SC-SM	A-4	0	0	95-100	95-100	95-100	45-75	5-16	NP-8
	29-35	Very fine sandy loam, fine sandy loam	SC-SM, ML	A-4	0	0	95-100	95-100	95-100	45-75	5-16	NP-8
	35-55	Sandy clay loam, loam, very fine sandy loam	CL, SC	A-4, A-6	0	0	95-100	95-100	95-100	55-75	10-27	8-25
	55-80	Very fine sandy loam, sandy clay loam, clay loam	CL, SC	A-4, A-6	0	0	95-100	95-100	95-100	55-75	16-42	8-25
CyA:												
Cypress---------	0-12	Mucky clay	CH	A-7-6	0	0	100	100	90-100	75-95	56-66	33-41
	12-17	Clay, clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	90-100	75-95	43-66	21-41
	17-80	Clay, clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	90-100	75-95	43-66	21-41
DAM:												
Dam-------------	---	---	---	---	---	---	---	---	---	---	---	---

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EsA:												
Estes-----------	0-8	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	8-23	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	23-31	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	31-62	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	62-80	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
EtA:												
Estes-----------	0-8	Clay	CL, CH	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	8-23	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	23-31	Clay	CL, CH	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	31-62	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	62-80	Clay	CL, CH	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
Angelina--------	0-5	Fine sandy loam	SC, SC-SM, CL-ML	A-4	0	0	100	100	80-100	45-70	20-30	5-15
	5-14	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-7-6	0	0	100	100	80-100	40-75	30-40	10-20
	14-29	Sandy clay loam, clay loam, loam	CL, SC	A-6, A-7-6	0	0	100	100	80-100	40-75	40-50	20-28
	29-46	Clay loam, sandy clay loam, loam	CL, SC	A-7-6, A-6	0	0	100	100	80-100	40-75	40-50	20-28
	46-67	Clay loam, sandy clay loam, loam	CL, SC	A-7-6, A-6	0	0	100	100	80-100	40-75	40-50	20-28
	67-80	Clay loam, sandy clay loam, loam	CL, SC	A-7-6, A-6	0	0	100	100	80-100	40-75	40-50	20-28
EvA:												
Evadale---------	0-5	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-100	16-31	NP-10
	5-16	Silt loam, loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-100	16-31	NP-10
	16-25	Silt loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	75-100	16-40	NP-20
	25-41	Silty clay loam, clay, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	95-100	90-100	46-65	25-41
	41-80	Clay, silty clay, silty clay loam	CL, CH	A-7-6	0	0	100	100	95-100	90-100	56-66	33-41

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EwA:												
Evadale---------	0-5	Silt loam	ML, CL-ML	A-4	0	0	100	95-100	90-100	75-100	16-31	NP-10
	5-16	Silt loam, loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-100	16-31	NP-10
	16-25	Silt loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	75-100	16-40	NP-20
	25-41	Silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0	0	100	100	95-100	90-100	46-65	25-41
	41-80	Clay, silty clay, silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	56-66	33-41
Gist------------	0-4	Silt loam	CL-ML, ML	A-4	0	0	98-100	98-100	95-100	60-90	9-18	NP-7
	4-15	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	98-100	98-100	95-100	60-90	9-18	NP-7
	15-41	Silt loam, loam	CL-ML, ML	A-4	0	0	98-100	98-100	95-100	70-90	15-23	2-7
	41-53	Clay loam, clay, silty clay loam	CH, CL	A-7-6	0	0	98-100	98-100	98-100	75-95	41-60	19-35
	53-80	Clay loam, silty clay loam, clay	CH, CL	A-7-6	0	0	98-100	98-100	98-100	75-95	41-60	19-35
ExA:												
Evadale---------	0-5	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-100	16-31	NP-10
	5-16	Silt loam, loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-100	16-31	NP-10
	16-25	Silt loam, loam	CL-ML, CL, ML	A-4, A-6	0	0	100	95-100	90-100	75-100	16-40	NP-20
	25-41	Silty clay loam, clay, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	95-100	90-100	46-65	25-41
	41-80	Clay, silty clay, silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	56-66	33-41
Texla-----------	0-5	Silt loam	CL-ML, ML	A-4	0	0	100	100	90-100	70-90	11-20	NP-5
	5-11	Silt loam	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	11-20	NP-5
	11-17	Silt loam	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	15-23	NP-7
	17-38	Silt loam, silty clay loam	CL	A-4	0	0	100	100	95-100	85-95	25-35	5-15
	38-80	Silty clay loam, clay loam, silty clay, clay	CH, CL	A-7-6, A-6	0	0	100	100	95-100	90-100	56-66	33-41

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
IbA:												
Iulus-----------	0-4	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	85-100	80-95	45-75	16-25	NP-6
	4-18	Loam, fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	85-100	80-95	45-75	16-25	NP-6
	18-58	Fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	85-100	80-95	45-75	16-25	NP-6
	58-80	Fine sandy loam, loam, sandy clay loam	CL, CL-ML, ML, SC	A-4, A-6	0	0	95-100	90-100	80-95	45-75	16-32	3-15
Bleakwood-------	0-3	Fine sandy loam	SC, SC-SM, CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-95	45-80	20-40	5-15
	3-14	Loam, clay loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-95	45-80	20-40	5-15
	14-58	Clay loam, loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-95	45-80	20-40	5-15
	58-80	Loam, clay loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-95	45-80	20-40	5-15
JaA:												
Jasco-----------	0-4	Silt loam	ML, CL-ML	A-4	0	0	100	95-100	90-100	80-97	16-23	NP-7
	4-15	Silt loam	ML, CL-ML	A-4	0	0	100	95-100	90-100	80-97	16-23	NP-7
	15-44	Silt loam, very fine sandy loam	CL-ML, ML, CL	A-4	0	0	100	95-100	90-100	65-95	16-30	2-10
	44-80	Silt loam, loam	CL-ML, ML, CL	A-4	0	0	100	95-100	90-100	65-95	16-30	2-10
JhA:												
Jayhawker-------	0-6	Silt loam	SM, ML	A-4	0	0	98-100	98-100	95-100	70-85	2-10	NP-3
	6-36	Silt loam, very fine sandy loam	ML, SM	A-4	0	0	98-100	98-100	95-100	70-85	2-16	NP-3
	36-69	Silt loam, very fine sandy loam	SM, ML, SC-SM, CL-ML	A-4	0	0	98-100	98-100	95-100	70-85	2-16	NP-3
	69-80	Silt loam, very fine sandy loam	CL-ML, SC-SM, ML, SM	A-4	0	0	98-100	98-100	95-100	70-85	2-16	1-6

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
KeB:												
Kenefick	0-3	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	75-100	40-60	16-22	NP-6
	3-26	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	75-100	40-60	16-22	NP-6
	26-55	Clay loam, sandy clay loam, loam	CL	A-6	0	0	100	100	80-100	55-85	29-38	10-15
	55-80	Fine sandy loam, sandy clay loam	CL, CL-ML, SC	A-4, A-6	0	0	100	100	80-100	40-70	23-30	7-11
KfA:												
Kenefick	0-3	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	75-100	40-60	16-22	NP-6
	3-26	Fine sandy loam	SM, CL-ML, ML, SC-SM	A-4	0	0	100	100	75-100	40-60	16-22	NP-6
	26-55	Clay loam, sandy clay loam, loam	CL	A-6	0	0	100	100	80-100	55-85	29-38	10-15
	55-80	Fine sandy loam, sandy clay loam	CL, CL-ML, SC	A-4, A-6	0	0	100	100	80-100	40-70	23-30	7-11
Caneyhead	0-4	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	75-90	16-23	3-7
	4-18	Silt loam, loam, very fine sandy loam	CL-ML, SC-SM	A-4	0	0	100	95-100	95-100	75-90	16-25	3-7
	18-29	Silt loam, clay loam, loam, silty clay loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	95-100	75-90	23-34	7-13
	29-63	Clay loam, silt loam, silty clay loam, loam	CL, CL-ML	A-6, A-4	0	0	100	95-100	95-100	75-90	25-38	8-15
	63-80	Silt loam, very fine sandy loam	ML, SC-SM	A-4	0	0	95-100	95-100	95-100	50-75	21-25	3-10

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
KrB:												
Kirbyville------	0-5	Very fine sandy loam	CL, CL-ML, ML, SM	A-4	0	0	95-100	95-100	85-100	48-78	8-21	NP-8
	5-18	Loam, fine sandy loam, very fine sandy loam	CL, CL-ML, ML, SM	A-4	0	0	95-100	95-100	85-100	48-78	8-21	NP-8
	18-25	Loam, sandy clay loam	CL, SC	A-4, A-6	0	0	95-100	95-100	85-100	48-78	23-34	6-13
	25-60	Loam, sandy clay loam, clay loam	CL, SC	A-4, A-6	0	0	95-100	95-100	85-100	40-78	23-34	6-13
	60-80	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-4	0	0	95-100	95-100	85-100	40-78	23-38	6-16
KwA:												
Kirbyville------	0-5	Very fine sandy loam	CL, CL-ML, ML, SM	A-4	0	0	95-100	95-100	85-100	48-78	8-21	NP-8
	5-18	Loam, fine sandy loam, very fine sandy loam	CL, CL-ML, ML, SM	A-4	0	0	95-100	95-100	85-100	48-78	8-21	NP-8
	18-25	Loam, sandy clay loam	CL, SC	A-4, A-6	0	0	95-100	95-100	85-100	48-78	23-34	6-13
	25-60	Loam, sandy clay loam, clay loam	CL, SC	A-4, A-6	0	0	95-100	95-100	85-100	40-78	23-34	6-13
	60-80	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-4	0	0	95-100	95-100	85-100	40-78	23-38	6-16
Niwana----------	0-3	Very fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	98-100	95-100	90-100	45-70	12-18	NP-7
	3-17	Very fine sandy loam, fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	98-100	95-100	90-100	45-70	12-18	NP-7
	17-80	Loam, sandy clay loam, fine sandy loam	CL, CL-ML	A-4	0	0	98-100	95-100	90-100	45-75	16-29	4-10

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
KzB:												
Kountze---------	0-6	Very fine sandy loam	ML	A-4	0	0	100	95-100	90-100	55-70	8-14	NP-3
	6-17	Very fine sandy loam, silt loam	ML	A-4	0	0	100	95-100	90-100	55-70	8-14	NP-3
	17-25	Very fine sandy loam, loam, silt loam	ML	A-4	0	0	100	95-100	90-100	55-70	8-16	NP-3
	25-43	Loam, very fine sandy loam, silt loam	ML, CL-ML	A-4	0	0	100	95-100	90-100	60-70	11-20	NP-7
	43-54	Loam, silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	95-100	90-100	60-75	13-23	NP-7
	54-80	Silt loam, very fine sandy loam, loam	ML, CL-ML	A-4	0	0	100	95-100	90-100	60-75	13-23	NP-7
LdA:												
Labelle---------	0-9	Silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-90	34-44	15-23
	9-16	Silty clay loam, silty clay, clay	CH, CL	A-7-6	0	0	100	100	95-100	85-95	46-60	25-36
	16-24	Silty clay, clay	CH	A-7-6	0	0	100	100	95-100	85-95	52-60	30-38
	24-64	Silty clay, clay	CH	A-7-6	0	0	100	100	95-100	85-95	52-60	30-38
	64-80	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	85-95	52-60	30-38
Levac-----------	0-4	Silt loam	CL, CL-ML	A-6	0	0	100	100	85-100	60-90	28-35	9-15
	4-13	Silt loam, loam	CL, CL-ML	A-6	0	0	100	100	85-100	60-90	28-35	9-15
	13-17	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-95	35-43	15-21
	17-72	Silty clay, clay	CH, CL	A-7-6	0	0	90-100	90-100	80-100	80-95	44-57	22-32
	72-80	Clay, silty clay	CL, CH	A-7-6	0	0	90-100	90-100	80-100	80-95	44-57	22-32

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LsA:												
Labelle---------	0-9	Silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-90	34-44	15-23
	9-16	Silty clay loam, silty clay, clay	CH, CL	A-7-6	0	0	100	100	95-100	85-95	46-60	25-36
	16-24	Silty clay, clay	CH	A-7-6	0	0	100	100	95-100	85-95	52-60	30-38
	24-64	Silty clay, clay	CH	A-7-6	0	0	100	100	95-100	85-95	52-60	30-38
	64-80	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	85-95	52-60	30-38
Spindletop------	0-10	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	75-85	15-35	NP-12
	10-21	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	75-85	15-35	NP-12
	21-26	Silty clay loam, silt loam	CL, CH	A-7-6, A-6	0	0	100	100	95-100	85-95	46-56	25-33
	26-34	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	90-95	52-60	28-35
	34-80	Silty clay, clay	CH	A-7-6	0	0	100	100	95-100	90-95	52-60	28-35
LtA:												
League----------	0-13	Clay	CH	A-7-6	0	0	100	100	90-100	85-97	59-78	41-59
	13-28	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
	28-45	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
	45-80	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
LvA:												
Lelavale--------	0-4	Silt loam	ML, CL-ML, CL	A-4	0	0	100	98-100	85-100	75-90	11-25	NP-8
	4-12	Silt loam, loam	CL-ML, ML, CL	A-4	0	0	100	98-100	85-100	75-85	16-30	3-10
	12-16	Loam, silt loam	CL-ML, ML, CL	A-4	0	0	100	98-100	85-100	75-85	16-30	3-10
	16-41	Clay loam, loam, silt loam	CL-ML, CL	A-4, A-6	0	0	100	98-100	85-100	75-90	23-38	7-16
	41-49	Clay, clay loam	CL, CH	A-7-5, A-7-6	0	0	100	95-100	90-100	75-90	36-52	14-23
	49-80	Clay loam, clay	CL, CH	A-6	0	0	100	95-100	90-100	75-90	36-47	14-20

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LwA:												
Leton-----------	0-4	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	98-100	95-100	70-90	21-30	5-12
	4-28	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	98-100	95-100	70-90	21-30	5-12
	28-49	Silt loam, silty clay loam, loam	CL	A-6, A-7-6	0	0	100	98-100	95-100	65-95	30-43	11-21
	49-80	Silt loam, silty clay loam, loam	CL	A-6, A-7-6	0	0	100	98-100	95-100	65-95	30-43	11-21
MaA:												
Manco-----------	0-4	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-95	60-90	25-36	8-17
	4-19	Loam, silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	90-100	65-90	34-46	15-25
	19-45	Loam, clay loam, silt loam	CL	A-4, A-6, A-7-6	0	0	100	100	90-100	65-90	34-50	15-28
	45-80	Loam, clay loam, silt loam	CL	A-4, A-6, A-7-6	0	0	100	100	90-100	65-90	34-50	15-28
McC:												
McNeely---------	0-5	Sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	75-90	5-15	8-13	NP-2
	5-37	Sand, loamy sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	75-90	5-15	8-13	NP-2
	37-72	Sand, loamy sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	75-90	5-15	8-13	NP-2
	72-80	Sand, loamy sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	75-90	5-15	8-13	NP-2
NdA:												
Nona------------	0-3	Very fine sandy loam	ML	A-4	0	0	100	95-100	90-100	55-90	8-14	NP-2
	3-19	Very fine sandy loam, silt loam, loam	ML	A-4	0	0	100	95-100	90-100	55-90	8-16	NP-3
	19-38	Clay loam, silt loam, loam	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	70-95	20-38	5-15
	38-80	Loam, clay loam, silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	70-95	20-38	5-15

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Dallardsville---	0-7	Very fine sandy loam	ML	A-4	0	0	100	95-100	95-100	45-65	8-14	NP-3
	7-38	Very fine sandy loam, fine sandy loam, silt loam	ML	A-4	0	0	100	95-100	95-100	45-65	8-14	NP-3
	38-61	Very fine sandy loam, loam, fine sandy loam, silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	50-75	14-23	NP-7
	61-75	Very fine sandy loam, fine sandy loam, loam	CL-ML	A-4	0	0	100	95-100	95-100	50-75	16-23	3-7
	75-80	Very fine sandy loam, loam, fine sandy loam, silt loam	CL-ML	A-4	0	0	100	95-100	95-100	50-75	16-23	3-7
Oa:												
Oil-waste land--	0-80	Variable	GP	A-1-a	---	---	---	---	---	---	---	---
OeA:												
Olive-----------	0-14	Silt loam	ML	A-4	0	0	100	100	90-100	55-65	7-12	NP
	14-22	Silt loam, fine sandy loam	ML	A-4	0	0	100	100	90-100	55-65	7-12	NP
	22-65	Fine sandy loam, silt loam	ML, CL-ML	A-4	0	0	100	100	95-100	55-65	8-18	NP-4
	65-80	Fine sandy loam, silt loam	CL-ML, ML	A-4	0	0	100	100	95-100	55-65	8-18	NP-4
OvA:												
Olive-----------	0-14	Silt loam	ML	A-4	0	0	100	100	90-100	55-65	7-12	NP
	14-22	Silt loam, fine sandy loam	ML	A-4	0	0	100	100	90-100	55-65	7-12	NP
	22-65	Fine sandy loam, silt loam	ML, CL-ML	A-4	0	0	100	100	95-100	55-65	8-18	NP-4
	65-80	Fine sandy loam, silt loam	CL-ML, ML	A-4	0	0	100	100	95-100	55-65	8-18	NP-4

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Dallardsville---	0-7	Very fine sandy loam	ML	A-4	0	0	100	95-100	95-100	45-65	8-14	NP-3
	7-38	Very fine sandy loam, silt loam, fine sandy loam	ML	A-4	0	0	100	95-100	95-100	45-65	8-14	NP-3
	38-61	Very fine sandy loam, loam, fine sandy loam, silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	50-75	14-23	NP-7
	61-75	Very fine sandy loam, loam, fine sandy loam	CL-ML	A-4	0	0	100	95-100	95-100	50-75	16-23	3-7
	75-80	Very fine sandy loam, loam, silt loam, fine sandy loam	CL-ML	A-4	0	0	100	95-100	95-100	50-75	16-23	3-7
OyB:												
Otanya----------	0-5	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-99	45-65	11-23	NP-7
	5-23	Fine sandy loam, very fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-99	45-65	11-23	NP-7
	23-44	Sandy clay loam, clay loam, loam	CL, SC	A-4, A-6	0	0	80-100	80-100	70-100	40-75	28-38	9-15
	44-74	Sandy clay loam, clay loam, loam	CL, SC	A-4, A-6	0	0	80-100	80-100	70-100	40-75	28-38	9-15
	74-80	Sandy clay loam, loam	SC, CL	A-4, A-6	0	0	80-100	80-100	70-100	40-75	28-38	9-15

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
OyC:												
Otanya----------	0-6	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-99	45-65	11-23	NP-7
	6-12	Fine sandy loam, very fine sandy loam	CL-ML, ML, SM, SC-SM	A-4	0	0	95-100	90-100	70-99	45-65	11-23	NP-7
	12-19	Sandy clay loam, clay loam, loam	CL, SC	A-4, A-6	0	0	80-100	80-100	70-100	40-75	28-38	9-15
	19-28	Sandy clay loam, clay loam, loam	CL, SC	A-4, A-6	0	0	80-100	80-100	70-100	40-75	28-38	9-15
	28-80	Sandy clay loam, loam	CL, SC	A-4, A-6	0	0	80-100	80-100	70-100	40-75	28-38	9-15
PkA:												
Plank-----------	0-3	Silt loam	CL-ML, ML	A-4	0	0	100	98-100	90-100	70-95	8-18	NP-4
	3-35	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	100	98-100	90-100	60-95	8-21	NP-6
	35-80	Silt loam, loam	CL-ML, ML	A-4	0	0	100	98-100	90-100	60-95	8-21	NP-6
SbC:												
Silsbee---------	0-5	Fine sandy loam	ML, SC-SM	A-4	0	0	95-100	95-100	90-100	35-65	7-13	NP
	5-15	Fine sandy loam, very fine sandy loam	ML, SC-SM	A-4	0	0	95-100	90-100	90-100	35-65	7-13	NP
	15-49	Sandy clay loam, clay loam, loam	SC, CL	A-6, A-4	0	0	95-100	90-100	90-100	55-75	23-34	7-13
	49-58	Sandy clay loam, clay loam, loam	SC, CL	A-6, A-4	0	0	95-100	90-100	90-100	55-75	23-38	7-15
	58-80	Sandy clay loam, loam, fine sandy loam	SC, CL	A-4, A-6	0	0	95-100	90-100	90-100	45-75	23-34	7-13

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SbD:												
Silsbee	0-5	Fine sandy loam	ML, SC-SM	A-4	0	0	95-100	95-100	90-100	35-65	7-13	NP
	5-15	Fine sandy loam, very fine sandy loam	ML, SC-SM	A-4	0	0	95-100	90-100	90-100	35-65	7-13	NP
	15-49	Sandy clay loam, clay loam, loam	SC, CL	A-6, A-4	0	0	95-100	90-100	90-100	55-75	23-34	7-13
	49-58	Sandy clay loam, clay loam, loam	SC, CL	A-6, A-4	0	0	95-100	90-100	90-100	55-75	23-38	7-15
	58-80	Sandy clay loam, loam, fine sandy loam	SC, CL	A-4, A-6	0	0	95-100	90-100	90-100	45-75	23-34	7-13
SdA:												
Sorter	0-3	Very fine sandy loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	51-80	7-16	NP-3
	3-41	Very fine sandy loam, silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	51-80	7-16	NP-3
	41-78	Very fine sandy loam, loam, silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	51-80	9-23	NP-7
	78-80	Very fine sandy loam, silt loam, loam	ML, CL-ML	A-4	0	0	100	95-100	95-100	51-80	9-23	NP-7

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Dallardsville---	0-7	Very fine sandy loam	ML	A-4	0	0	100	95-100	95-100	45-65	8-14	NP-3
	7-38	Very fine sandy loam, fine sandy loam, silt loam	ML	A-4	0	0	100	95-100	95-100	45-65	8-14	NP-3
	38-61	Very fine sandy loam, fine sandy loam, silt loam, loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	50-75	14-23	NP-7
	61-75	Very fine sandy loam, loam, fine sandy loam	CL-ML	A-4	0	0	100	95-100	95-100	50-75	16-23	3-7
	75-80	Very fine sandy loam, loam, silt loam, fine sandy loam	CL-ML	A-4	0	0	100	95-100	95-100	50-75	16-23	3-7
SpB:												
Spurger---------	0-5	Very fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-99	50-75	16-25	NP-7
	5-11	Very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-99	50-75	16-25	NP-7
	11-58	Clay, clay loam	CH, CL	A-7-6	0	0	95-100	95-100	90-100	75-95	41-70	20-40
	58-74	Sandy clay loam, clay loam, loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	90-100	80-100	35-75	28-43	9-21
	74-80	Loamy fine sand, fine sandy loam	SC-SM, SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	90-100	50-95	20-50	14-30	NP-11
TuB:												
Turkey----------	0-5	Sand	SP-SM	A-2-4, A-3	0	0	95-100	90-100	80-90	5-15	8-13	NP-2
	5-10	Sand, loamy sand	SP-SM	A-2-4, A-3	0	0	95-100	90-100	80-90	5-15	8-13	NP-2
	10-80	Sand, loamy sand	SP-SM	A-3, A-2-4	0	0	95-100	90-100	80-90	5-15	8-13	NP-2

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
TyA:												
Tyden-----------	0-6	Silt loam	ML, SM	A-4	0	0	100	100	90-100	55-80	7-12	NP-2
	6-13	Very fine sandy loam, silt loam, fine sandy loam	ML, SM	A-4	0	0	100	100	90-100	45-70	7-12	NP-2
	13-19	Fine sandy loam, silt loam, very fine sandy loam	ML, SM	A-4	0	0	100	100	90-100	45-70	7-12	NP-2
	19-41	Fine sandy loam, loamy fine sand	ML, SM	A-4	0	0	100	100	90-100	45-70	7-16	NP-3
	41-73	Fine sandy loam, loamy fine sand	ML, SM	A-4	0	0	100	100	90-100	45-70	7-16	NP-3
	73-80	Fine sandy loam, loam, sandy clay loam	ML, SM	A-4	0	0	100	100	90-100	45-70	8-21	NP-6
Babco-----------	0-8	Loamy fine sand	SM	A-2-4	0	0	100	100	95-100	30-40	7-11	NP-2
	8-12	Loamy fine sand	SM	A-2-4	0	0	100	100	95-100	30-40	7-11	NP-2
	12-16	Fine sandy loam	SM	A-4	0	0	100	100	95-100	35-45	7-12	NP-2
	16-22	Fine sandy loam, loamy very fine sand	SM, ML	A-4	0	0	100	100	95-100	35-45	7-15	NP-3
	22-55	Fine sandy loam, loam	SM, ML	A-4	0	0	100	100	95-100	35-45	7-20	NP-5
	55-80	Fine sandy loam, loam	SM	A-4	0	0	100	100	95-100	35-45	7-20	NP-5
VaA:												
Vamont----------	0-5	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	5-19	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	19-80	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
VoA:												
Votaw-----------	0-4	Fine sand	SP-SM, SM	A-2-4	0	0	100	100	90-95	10-20	7-10	NP-1
	4-29	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	90-95	10-20	7-10	NP-1
	29-63	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	90-95	10-20	7-10	NP-1
	63-80	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	100	100	90-95	10-20	7-10	NP-1
W:												
Water-----------	---	---	---	---	---	---	---	---	---	---	---	---
WdA:												
Waller----------	0-3	Very fine sandy loam	CL-ML, ML	A-4	0	0	100	98-100	95-100	60-75	11-20	NP-5
	3-30	Silt loam, loam, very fine sandy loam	CL-ML, ML	A-4	0	0	100	98-100	95-100	60-75	11-20	NP-5
	30-56	Clay loam, loam, sandy clay loam	CL, SC	A-6, A-4	0	0	100	98-100	95-100	60-80	23-34	7-13
	56-65	Clay loam, loam, sandy clay loam	CL, SC	A-4, A-6	0	0	100	98-100	95-100	60-80	23-34	7-13
	65-80	Clay loam, loam, sandy clay loam	CL, SC	A-4, A-6	0	0	100	98-100	95-100	60-80	23-34	7-13

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Dallardsville---	0-7	Very fine sandy loam	ML	A-4	0	0	100	95-100	95-100	45-65	8-14	NP-3
	7-38	Very fine sandy loam, fine sandy loam, silt loam	ML	A-4	0	0	100	95-100	95-100	45-65	8-14	NP-3
	38-61	Very fine sandy loam, fine sandy loam, silt loam, loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	50-75	14-23	NP-7
	61-75	Very fine sandy loam, loam, fine sandy loam	CL-ML	A-4	0	0	100	95-100	95-100	50-75	16-23	3-7
	75-80	Very fine sandy loam, loam, fine sandy loam, silt loam	CL-ML	A-4	0	0	100	95-100	95-100	50-75	16-23	3-7

Table 15.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
AnA:														
Anahuac--------------	0-8	30-65	25-65	5-10	1.25-1.40	14.00-42.00	0.13-0.20	0.0-2.9	1.0-3.0	.49	.49	5	5	56
	8-19	30-65	25-65	5-15	1.35-1.60	14.00-42.00	0.13-0.20	0.0-2.9	0.1-0.5	.49	.49			
	19-32	30-65	25-65	10-25	1.35-1.60	14.00-42.00	0.13-0.20	0.0-2.9	0.1-0.5	.43	.43			
	32-49	25-50	20-50	35-45	1.40-1.60	0.01-0.06	0.14-0.20	3.0-9.0	0.1-0.5	.32	.32			
	49-72	25-50	20-50	35-45	1.40-1.60	0.01-0.06	0.14-0.20	6.0-9.0	0.1-0.5	.32	.32			
	72-80	25-50	20-50	35-45	1.40-1.60	0.01-0.06	0.14-0.20	6.0-9.0	0.1-0.5	.32	.32			
Aris-----------------	0-6	20-40	50-70	10-25	1.35-1.55	4.00-14.00	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	6-15	20-40	50-70	10-25	1.35-1.55	4.00-14.00	0.11-0.15	0.0-2.9	0.5-1.0	.43	.43			
	15-24	15-30	50-65	20-35	1.35-1.60	0.01-0.06	0.12-0.18	0.0-2.9	0.0-0.5	.32	.32			
	24-80	15-40	25-60	30-45	1.40-1.60	0.01-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
ArA:														
Aris-----------------	0-6	20-40	50-70	10-25	1.35-1.55	4.00-14.00	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	6-15	20-40	50-70	10-25	1.35-1.55	4.00-14.00	0.11-0.15	0.0-2.9	0.5-1.0	.43	.43			
	15-24	15-30	50-65	20-35	1.35-1.60	0.01-0.06	0.12-0.18	0.0-2.9	0.0-0.5	.32	.32			
	24-80	15-40	25-60	30-45	1.40-1.60	0.01-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
Levac----------------	0-4	20-40	40-60	10-27	1.30-1.50	4.00-14.00	0.14-0.18	0.0-2.9	1.0-2.0	.43	.43	5	6	48
	4-13	20-40	40-60	10-27	1.30-1.50	4.00-14.00	0.14-0.18	0.0-2.9	0.5-1.0	.43	.43			
	13-17	15-40	40-60	27-35	1.30-1.55	1.40-4.00	0.14-0.18	3.0-5.9	0.1-1.0	.43	.43			
	17-72	10-40	40-50	40-45	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	72-80	15-40	30-50	40-45	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
AsA:														
Aris-----------------	0-6	20-40	50-70	10-25	1.35-1.55	4.00-14.00	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	6-15	20-40	50-70	10-25	1.35-1.55	4.00-14.00	0.11-0.15	0.0-2.9	0.5-1.0	.43	.43			
	15-24	15-30	50-65	20-35	1.35-1.60	0.01-0.06	0.12-0.18	0.0-2.9	0.0-0.5	.32	.32			
	24-80	15-40	25-60	30-45	1.40-1.60	0.01-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
Spindletop-----------	0-10	20-30	50-70	5-20	1.30-1.60	4.00-14.00	0.16-0.20	0.0-2.9	2.0-3.0	.43	.43	5	5	56
	10-21	20-30	50-70	5-20	1.30-1.60	4.00-14.00	0.16-0.20	0.0-2.9	1.0-2.0	.43	.43			
	21-26	10-20	40-60	25-35	1.35-1.60	1.40-4.00	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	26-34	10-25	30-55	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	34-80	10-70	30-55	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			

Table 15.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
BaA:														
Batson---------------	0-6	60-75	25-40	2-8	1.20-1.35	14.00-42.00	0.11-0.20	0.0-2.9	1.0-2.0	.49	.49	5	3	86
	6-29	60-75	25-40	2-8	1.30-1.50	14.00-42.00	0.11-0.20	0.0-2.9	0.0-0.5	.49	.49			
	29-35	50-65	20-50	2-15	1.30-1.50	14.00-42.00	0.11-0.20	0.0-2.9	0.0-0.5	.49	.49			
	35-55	45-60	20-40	18-30	1.45-1.60	4.00-14.00	0.15-0.20	0.0-2.9	0.0-0.5	.49	.49			
	55-80	45-70	19-40	15-30	1.45-1.60	4.00-14.00	0.15-0.20	2.0-3.5	0.0-0.2	.49	.49			
BeA:														
Beaumont-------------	0-15	15-30	20-40	45-60	1.15-1.35	0.42-1.40	0.12-0.18	9.0-25.0	1.0-3.0	.32	.32	5	4	86
	15-38	5-30	20-40	45-60	1.25-1.45	0.01-0.42	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	38-55	5-30	20-40	45-60	1.30-1.50	0.01-0.42	0.15-0.20	9.0-25.0	0.1-1.0	.32	.32			
	55-80	10-30	20-40	45-60	1.30-1.50	0.01-0.42	0.15-0.20	9.0-25.0	0.1-1.0	.32	.32			
BoB:														
Belrose--------------	0-5	70-85	10-25	0-5	1.35-1.45	4.00-42.00	0.09-0.15	0.0-2.0	0.5-1.5	.49	.49	5	2	134
	5-20	70-85	10-25	0-5	1.40-1.50	4.00-42.00	0.09-0.15	0.0-1.0	0.5-1.0	.49	.49			
	20-44	70-85	10-25	1-10	1.30-1.45	4.00-42.00	0.09-0.15	0.0-1.0	0.0-0.5	.49	.49			
	44-63	70-85	10-25	2-15	1.30-1.45	4.00-42.00	0.09-0.20	0.0-2.0	0.0-0.5	.49	.49			
	63-75	45-85	10-35	10-25	1.35-1.55	4.00-14.00	0.13-0.20	0.0-3.0	0.0-0.5	.43	.43			
	75-80	55-85	8-35	4-18	1.35-1.50	4.00-14.00	0.13-0.20	0.0-2.0	0.0-0.5	.43	.43			
BrA:														
Belrose--------------	0-5	70-85	10-25	0-5	1.35-1.45	4.00-42.00	0.09-0.15	0.0-2.0	0.5-1.5	.49	.49	5	2	134
	5-20	70-85	10-25	0-5	1.40-1.50	4.00-42.00	0.09-0.15	0.0-1.0	0.5-1.0	.49	.49			
	20-44	70-85	10-25	1-10	1.30-1.45	4.00-42.00	0.09-0.15	0.0-1.0	0.0-0.5	.49	.49			
	44-63	70-85	10-25	2-15	1.30-1.45	4.00-42.00	0.09-0.20	0.0-2.0	0.0-0.5	.49	.49			
	63-75	45-85	10-35	10-25	1.35-1.55	4.00-14.00	0.13-0.20	0.0-3.0	0.0-0.5	.43	.43			
	75-80	55-85	8-35	4-18	1.35-1.50	4.00-14.00	0.13-0.20	0.0-2.0	0.0-0.5	.43	.43			
Caneyhead------------	0-4	20-55	35-70	10-18	1.20-1.35	0.42-4.00	0.13-0.24	1.0-2.5	1.5-2.5	.43	.43	5	5	56
	4-18	25-55	35-70	10-20	1.30-1.60	0.42-4.00	0.13-0.24	1.0-2.0	0.2-1.0	.55	.55			
	18-29	10-35	35-70	18-30	1.30-1.60	0.42-1.40	0.16-0.24	1.0-3.0	0.2-1.0	.43	.43			
	29-63	15-40	30-65	20-35	1.30-1.60	0.42-1.40	0.16-0.24	1.0-4.5	0.0-0.5	.43	.43			
	63-80	30-65	15-60	15-20	1.30-1.60	0.42-4.00	0.16-0.24	1.0-4.5	0.0-0.2	.43	.43			
BvA:														
Bevil----------------	0-4	15-30	20-35	45-60	1.15-1.35	0.42-1.40	0.12-0.18	9.0-25.0	1.0-3.0	.32	.32	5	4	86
	4-10	15-30	20-35	45-60	1.25-1.45	0.42-1.40	0.12-0.18	9.0-25.0	1.0-2.0	.32	.32			
	10-22	15-30	20-35	45-60	1.25-1.45	0.01-0.42	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
	22-37	15-30	20-35	45-60	1.25-1.45	0.01-0.42	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
	37-80	15-30	20-35	45-60	1.30-1.50	0.01-0.42	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			

Table 15.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
CaA:														
Camptown-------------	0-4	20-40	50-65	5-18	1.25-1.45	4.00-42.00	0.15-0.20	0.0-2.9	1.0-2.0	.43	.43	5	5	56
	4-13	20-45	50-65	5-18	1.50-1.75	4.00-42.00	0.12-0.20	0.0-2.9	0.5-1.0	.43	.43			
	13-46	10-40	40-65	5-18	1.50-1.75	4.00-42.00	0.12-0.20	0.0-2.9	0.5-1.0	.43	.43			
	46-69	10-40	40-60	15-30	1.50-1.75	0.01-0.42	0.12-0.18	0.0-2.9	0.1-0.5	.43	.43			
	69-80	10-35	30-50	18-45	1.50-1.70	0.01-0.42	0.11-0.16	3.0-5.9	0.1-0.5	.37	.37			
CbA:														
Camptown-------------	0-4	20-40	50-65	5-18	1.25-1.45	4.00-42.00	0.15-0.20	0.0-2.9	1.0-2.0	.43	.43	5	5	56
	4-13	20-45	50-65	5-18	1.50-1.75	4.00-42.00	0.12-0.20	0.0-2.9	0.5-1.0	.43	.43			
	13-46	10-40	40-65	5-18	1.50-1.75	4.00-42.00	0.12-0.20	0.0-2.9	0.5-1.0	.43	.43			
	46-69	10-40	40-60	15-30	1.50-1.75	0.01-0.42	0.12-0.18	0.0-2.9	0.1-0.5	.43	.43			
	69-80	10-35	30-50	18-45	1.50-1.70	0.01-0.42	0.11-0.16	3.0-5.9	0.1-0.5	.37	.37			
Batson---------------	0-6	60-75	25-40	2-8	1.20-1.35	14.00-42.00	0.11-0.20	0.0-2.9	1.0-2.0	.49	.49	5	3	86
	6-29	60-75	25-40	2-8	1.30-1.50	14.00-42.00	0.11-0.20	0.0-2.9	0.0-0.5	.49	.49			
	29-35	50-65	20-50	2-15	1.30-1.50	14.00-42.00	0.11-0.20	0.0-2.9	0.0-0.5	.49	.49			
	35-55	45-60	20-40	18-30	1.45-1.60	4.00-14.00	0.15-0.20	0.0-2.9	0.0-0.5	.49	.49			
	55-80	45-70	19-40	15-30	1.45-1.60	4.00-14.00	0.15-0.20	2.0-3.5	0.0-0.2	.49	.49			
CyA:														
Cypress--------------	0-12	10-30	25-50	40-50	1.40-1.70	0.01-0.41	0.15-0.20	3.0-5.9	2.0-5.0	.32	.32	5	4	86
	12-17	10-30	25-50	30-50	1.10-1.50	0.01-0.41	0.12-0.20	3.0-5.9	1.0-2.0	.32	.32			
	17-80	10-30	25-50	30-50	1.10-1.50	0.01-0.41	0.12-0.20	3.0-5.9	0.5-1.0	.32	.32			
DAM:														
Dam------------------	---	---	---	---	---	---	---	---	---	---	---	--	---	---
EsA:														
Estes----------------	0-8	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32	5	4	86
	8-23	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
	23-31	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
	31-62	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
	62-80	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			

Table 15.--Physical Properties of the Soil--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
EtA:														
Estes	0-8	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32	5	4	86
	8-23	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
	23-31	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
	31-62	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
	62-80	10-30	20-40	40-59	1.40-1.55	0.01-0.42	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
Angelina	0-5	40-65	20-40	10-25	1.20-1.40	0.42-1.40	0.12-0.17	0.0-2.9	1.0-3.0	.28	.28	5	5	56
	5-14	30-65	20-40	24-35	1.20-1.40	0.42-1.40	0.12-0.17	0.0-2.9	0.5-2.0	.28	.28			
	14-29	30-65	10-40	24-35	1.20-1.40	0.42-1.40	0.12-0.17	0.0-2.9	0.5-1.0	.28	.28			
	29-46	30-65	20-40	24-35	1.20-1.40	0.42-1.40	0.12-0.17	0.0-2.9	0.5-1.0	.28	.28			
	46-67	30-65	20-40	24-35	1.20-1.40	0.42-1.40	0.12-0.17	0.0-2.9	0.5-1.0	.28	.28			
	67-80	30-65	20-40	24-35	1.20-1.40	0.42-1.40	0.12-0.17	0.0-2.9	0.5-1.0	.28	.28			
EvA:														
Evadale	0-5	15-60	40-70	5-18	1.20-1.50	4.20-14.00	0.16-0.22	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	5-16	15-40	50-70	5-18	1.20-1.50	4.20-14.00	0.16-0.22	0.0-2.9	0.5-2.0	.43	.43			
	16-25	10-40	45-70	5-25	1.20-1.50	0.42-1.40	0.16-0.22	0.0-2.9	0.5-2.0	.43	.43			
	25-41	5-25	30-60	30-45	1.30-1.60	0.01-0.41	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
	41-80	5-25	30-50	30-50	1.35-1.65	0.01-0.41	0.18-0.22	6.0-8.9	0.1-0.5	.32	.32			
EwA:														
Evadale	0-5	15-60	40-70	5-18	1.20-1.50	4.20-56.00	0.16-0.22	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	5-16	15-40	50-70	5-18	1.20-1.50	4.20-56.00	0.16-0.22	0.0-2.9	0.5-2.0	.43	.43			
	16-25	10-40	45-70	5-25	1.20-1.50	0.42-28.00	0.16-0.22	0.0-2.9	0.5-2.0	.43	.43			
	25-41	5-25	30-60	30-45	1.30-1.60	0.01-0.41	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
	41-80	5-25	30-50	30-50	1.35-1.65	0.01-0.41	0.18-0.22	6.0-8.9	0.1-0.5	.32	.32			
Gist	0-4	20-45	40-65	3-12	1.20-1.40	4.00-14.00	0.13-0.24	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	4-15	20-45	40-65	3-12	1.20-1.40	4.00-14.00	0.13-0.24	0.0-2.9	0.1-0.5	.37	.37			
	15-41	20-45	40-65	8-18	1.20-1.40	4.00-14.00	0.13-0.24	0.0-2.9	0.1-0.5	.37	.37			
	41-53	15-30	30-50	35-45	1.30-1.50	0.01-0.42	0.15-0.20	6.0-8.9	0.1-0.5	.32	.32			
	53-80	15-30	30-50	35-45	1.30-1.50	0.01-0.42	0.15-0.20	6.0-8.9	0.1-0.5	.32	.32			
ExA:														
Evadale	0-5	15-60	40-70	5-18	1.20-1.50	4.20-14.00	0.16-0.22	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	5-16	15-40	50-70	5-18	1.20-1.50	4.20-14.00	0.16-0.22	0.0-2.9	0.5-2.0	.43	.43			
	16-25	10-40	45-70	5-25	1.20-1.50	0.42-1.40	0.16-0.22	0.0-2.9	0.5-2.0	.43	.43			
	25-41	5-25	30-60	30-45	1.30-1.60	0.01-0.41	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
	41-80	5-25	30-50	30-50	1.35-1.65	0.01-0.41	0.18-0.22	6.0-8.9	0.1-0.5	.32	.32			

Table 15.--Physical Properties of the Soil--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Texla----------------	0-5	30-50	35-70	2-15	1.30-1.50	4.00-14.00	0.16-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	5-11	30-50	35-70	2-15	1.30-1.50	4.00-14.00	0.16-0.24	0.0-2.9	1.0-2.0	.43	.43			
	11-17	25-45	35-70	5-18	1.30-1.50	4.00-14.00	0.16-0.24	0.0-2.9	1.0-2.0	.43	.43			
	17-38	10-45	30-60	18-34	1.35-1.60	4.00-14.00	0.12-0.18	3.0-5.9	0.5-2.0	.37	.37			
	38-80	5-30	30-50	30-50	1.35-1.65	0.01-0.40	0.18-0.22	6.0-8.9	0.1-0.5	.32	.32			
IbA:														
Iulus----------------	0-4	40-65	25-45	6-20	1.26-1.45	4.00-14.00	0.11-0.18	0.0-2.9	0.1-1.0	.32	.32	5	5	56
	4-18	40-65	25-45	6-20	1.26-1.45	4.00-14.00	0.11-0.18	0.0-2.9	0.1-1.0	.32	.32			
	18-58	40-65	25-45	6-20	1.26-1.45	4.00-14.00	0.11-0.18	0.0-2.9	0.1-1.0	.32	.32			
	58-80	30-65	25-45	10-28	1.30-1.50	4.00-14.00	0.11-0.18	0.0-2.9	0.1-1.0	.32	.32			
Bleakwood------------	0-3	40-70	20-40	12-27	1.20-1.40	4.00-14.00	0.14-0.20	0.0-2.9	0.2-1.0	.28	.28	5	3	86
	3-14	30-65	30-50	12-35	1.20-1.40	4.00-14.00	0.14-0.20	0.0-2.9	0.2-1.0	.28	.28			
	14-58	30-65	30-50	12-35	1.20-1.40	4.00-14.00	0.14-0.20	0.0-2.9	0.2-1.0	.28	.28			
	58-80	30-65	30-50	12-35	1.20-1.40	4.00-14.00	0.14-0.20	0.0-2.9	0.2-1.0	.28	.28			
JaA:														
Jasco----------------	0-4	20-40	50-70	5-18	1.40-1.60	4.00-14.00	0.12-0.22	0.0-2.9	0.5-1.0	.43	.43	4	3	86
	4-15	20-40	50-70	5-18	1.40-1.60	4.00-14.00	0.12-0.22	0.0-2.9	0.5-1.0	.43	.43			
	15-44	20-60	35-70	10-18	1.70-1.90	0.01-0.40	0.00-0.05	0.0-2.9	0.1-0.5	.37	.37			
	44-80	20-50	35-70	10-20	1.70-1.90	0.01-0.40	0.00-0.05	0.0-2.9	0.1-0.5	.37	.37			
JhA:														
Jayhawker------------	0-6	25-60	35-75	1-7	1.45-1.55	4.23-14.00	0.11-0.20	0.5-1.5	1.0-1.5	.49	.49	5	5	56
	6-36	25-60	35-75	2-10	1.55-1.65	1.41-4.20	0.11-0.20	0.0-1.0	0.0-0.5	.49	.49			
	36-69	25-60	35-75	3-15	1.55-1.70	0.01-0.40	0.11-0.20	0.5-1.5	0.0-0.5	.49	.49			
	69-80	25-60	35-75	2-15	1.65-1.90	0.01-0.40	0.11-0.20	0.0-1.0	0.0-0.5	.49	.49			
KeB:														
Kenefick-------------	0-3	50-65	25-50	5-15	1.30-1.45	14.00-42.00	0.11-0.15	0.0-2.9	0.2-2.0	.24	.24	5	3	86
	3-26	50-65	25-50	5-15	1.30-1.45	14.00-42.00	0.11-0.15	0.0-2.9	0.2-2.0	.24	.24			
	26-55	30-65	15-50	20-34	1.35-1.55	4.00-14.00	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	55-80	45-65	15-35	10-24	1.50-1.65	4.00-14.00	0.12-0.17	0.0-2.9	0.1-1.0	.37	.37			
KfA:														
Kenefick-------------	0-3	50-65	25-50	5-15	1.30-1.45	14.00-42.00	0.11-0.15	0.0-2.9	0.2-2.0	.24	.24	5	3	86
	3-26	50-65	25-50	5-15	1.30-1.45	14.00-42.00	0.11-0.15	0.0-2.9	0.2-2.0	.24	.24			
	26-55	30-65	15-50	20-34	1.35-1.55	4.00-14.00	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	55-80	45-65	15-35	10-24	1.50-1.65	4.00-14.00	0.12-0.17	0.0-2.9	0.1-1.0	.37	.37			

Table 15.--Physical Properties of the Soil--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Caneyhead------------	0-4	20-55	35-70	10-18	1.20-1.35	0.42-4.00	0.13-0.24	1.0-2.5	1.5-2.5	.43	.43	5	5	56
	4-18	25-55	35-70	10-20	1.30-1.60	0.42-4.00	0.13-0.24	1.0-2.0	0.2-1.0	.55	.55			
	18-29	10-35	35-70	18-30	1.30-1.60	0.42-1.40	0.16-0.24	1.0-3.0	0.2-1.0	.43	.43			
	29-63	15-40	30-65	20-35	1.30-1.60	0.42-1.40	0.16-0.24	1.0-4.5	0.0-0.5	.43	.43			
	63-80	30-65	15-60	15-20	1.30-1.60	0.42-1.40	0.16-0.24	1.0-4.5	0.0-0.2	.43	.43			
KrB:														
Kirbyville-----------	0-5	40-65	35-50	5-15	1.50-1.70	14.00-42.00	0.11-0.24	0.0-2.9	1.0-2.5	.32	.32	5	3	86
	5-18	40-65	35-50	5-15	1.50-1.70	14.00-42.00	0.11-0.24	0.0-2.9	0.5-1.0	.32	.32			
	18-25	30-65	15-50	18-30	1.50-1.70	4.00-14.00	0.15-0.24	0.0-2.9	0.1-0.5	.28	.28			
	25-60	30-65	15-50	18-30	1.50-1.70	4.00-14.00	0.15-0.24	0.0-2.9	0.1-0.5	.28	.28			
	60-80	30-65	15-50	18-35	1.50-1.70	4.00-14.00	0.15-0.20	0.0-2.9	0.1-0.5	.28	.28			
KwA:														
Kirbyville-----------	0-5	40-65	35-50	5-15	1.50-1.70	14.00-42.00	0.11-0.24	0.0-2.9	1.0-2.5	.32	.32	5	3	86
	5-18	40-65	35-50	5-15	1.50-1.70	14.00-42.00	0.11-0.24	0.0-2.9	0.5-1.0	.32	.32			
	18-25	30-65	15-50	18-30	1.50-1.70	4.00-14.00	0.15-0.24	0.0-2.9	0.1-0.5	.28	.28			
	25-60	30-65	15-50	18-30	1.50-1.70	4.00-14.00	0.15-0.24	0.0-2.9	0.1-0.5	.28	.28			
	60-80	30-65	15-50	18-35	1.50-1.70	4.00-14.00	0.15-0.20	0.0-2.9	0.1-0.5	.28	.28			
Niwana---------------	0-3	45-65	20-50	5-12	1.20-1.40	14.00-42.00	0.11-0.20	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	3-17	45-65	20-50	5-12	1.20-1.40	14.00-42.00	0.11-0.20	0.0-2.9	0.5-1.0	.24	.24			
	17-80	35-65	15-50	10-25	1.40-1.60	4.00-14.00	0.15-0.20	0.0-2.9	0.1-0.5	.32	.32			
KzB:														
Kountze--------------	0-6	30-65	25-65	2-8	1.35-1.50	4.23-14.00	0.13-0.24	0.5-2.0	1.5-3.0	.43	.43	5	3	86
	6-17	30-65	25-65	2-8	1.45-1.55	4.23-14.00	0.13-0.24	0.5-1.5	0.2-1.0	.49	.49			
	17-25	30-65	25-65	2-10	1.40-1.50	4.23-14.00	0.13-0.24	0.5-1.5	0.0-0.5	.49	.49			
	25-43	25-65	25-70	5-15	1.40-1.50	4.23-14.00	0.13-0.24	0.5-1.5	0.0-0.5	.49	.49			
	43-54	25-65	25-65	7-18	1.45-1.55	1.40-4.00	0.13-0.24	0.5-3.0	0.0-0.5	.49	.49			
	54-80	25-65	25-65	7-18	1.45-1.55	1.40-4.00	0.13-0.24	0.5-2.5	0.0-0.5	.49	.49			
LdA:														
Labelle--------------	0-9	10-30	50-70	18-27	1.30-1.50	4.00-14.00	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	9-16	10-30	45-65	30-45	1.30-1.60	4.00-14.00	0.16-0.20	3.0-5.9	1.0-3.0	.43	.43			
	16-24	5-30	30-60	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	24-64	5-30	30-60	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	64-80	5-30	30-60	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			

Table 15.--Physical Properties of the Soil--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Levac----------------	0-4	20-40	40-60	10-27	1.30-1.50	4.00-14.00	0.14-0.18	0.0-2.9	1.0-2.0	.43	.43	5	6	48
	4-13	20-40	40-60	10-27	1.30-1.50	4.00-14.00	0.14-0.18	0.0-2.9	0.5-1.0	.43	.43			
	13-17	15-40	40-60	27-35	1.30-1.55	1.40-4.00	0.14-0.18	3.0-5.9	0.1-1.0	.43	.43			
	17-72	10-40	40-50	40-45	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	72-80	15-40	30-50	40-45	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
LsA:														
Labelle--------------	0-9	10-30	50-70	18-27	1.30-1.50	4.00-14.00	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	9-16	10-30	45-65	30-45	1.30-1.60	4.00-14.00	0.16-0.20	3.0-5.9	1.0-3.0	.43	.43			
	16-24	5-30	30-60	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	24-64	5-30	30-60	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	64-80	5-30	30-60	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
Spindletop-----------	0-10	20-30	50-70	5-20	1.30-1.60	4.00-14.00	0.16-0.20	0.0-2.9	2.0-3.0	.43	.43	5	5	56
	10-21	20-30	50-70	5-20	1.30-1.60	4.00-14.00	0.16-0.20	0.0-2.9	1.0-2.0	.43	.43			
	21-26	10-20	40-60	25-35	1.35-1.60	1.40-4.00	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	26-34	10-25	30-55	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	34-80	10-70	30-55	40-50	1.35-1.60	0.01-0.42	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
LtA:														
League---------------	0-13	15-25	20-40	45-60	1.15-1.35	0.01-0.42	0.12-0.18	9.0-25.0	1.0-5.0	.32	.32	5	4	86
	13-28	15-25	20-40	45-60	1.25-1.45	0.01-0.42	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	28-45	15-25	20-40	45-60	1.25-1.45	0.01-0.42	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	45-80	15-25	20-40	45-60	1.30-1.45	0.01-0.42	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
LvA:														
Lelavale-------------	0-4	20-45	40-70	5-20	1.40-1.60	1.40-4.00	0.15-0.24	0.5-2.0	0.5-1.0	.43	.43	5	5	56
	4-12	20-40	40-70	10-25	1.45-1.65	1.40-4.00	0.15-0.24	0.5-2.0	0.0-0.5	.43	.43			
	12-16	20-35	40-70	10-25	1.45-1.65	1.40-4.00	0.15-0.24	0.5-2.0	0.0-0.5	.43	.43			
	16-41	20-35	40-70	18-35	1.50-1.70	0.42-1.40	0.15-0.24	0.5-2.0	0.0-0.5	.37	.37			
	41-49	10-30	25-50	32-50	1.60-1.75	0.01-0.42	0.12-0.16	6.0-10.0	0.0-0.5	.37	.37			
	49-80	10-30	25-50	32-45	1.60-1.75	0.01-0.40	0.12-0.18	2.0-10.0	0.0-0.5	.37	.37			
LwA:														
Leton----------------	0-4	15-40	40-65	10-25	1.20-1.50	4.00-14.00	0.15-0.20	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	4-28	15-40	40-65	10-25	1.20-1.50	4.00-14.00	0.15-0.20	0.0-2.9	1.0-3.0	.43	.43			
	28-49	5-40	40-65	20-35	1.30-1.60	0.42-1.40	0.15-0.20	3.0-5.9	0.2-0.5	.37	.37			
	49-80	5-40	40-65	20-35	1.30-1.60	0.42-1.40	0.15-0.20	3.0-5.9	0.2-0.5	.37	.37			
MaA:														
Manco----------------	0-4	25-45	40-60	9-20	1.25-1.45	4.00-14.00	0.15-0.20	0.0-2.9	1.0-4.0	.37	.37	5	8	56
	4-19	25-45	40-60	18-30	1.25-1.45	4.00-14.00	0.11-0.24	0.0-2.9	0.2-1.0	.37	.37			
	19-45	25-45	40-60	18-34	1.25-1.45	4.00-14.00	0.12-0.22	3.0-5.9	0.2-1.0	.37	.37			
	45-80	10-45	40-60	18-34	1.25-1.45	4.00-14.00	0.12-0.22	3.0-5.9	0.2-1.0	.37	.37			

Table 15.--Physical Properties of the Soil--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
McC:														
McNeely--------------	0-5	80-95	1-8	1-7	1.35-1.50	141.00-705.00	0.02-0.08	0.0-1.0	1.0-2.0	.15	.15	5	1	180
	5-37	80-97	1-8	1-7	1.50-1.55	141.00-705.00	0.02-0.08	0.0-1.0	0.0-0.5	.15	.15			
	37-72	80-97	1-8	1-7	1.50-1.55	141.00-705.00	0.02-0.08	0.0-1.0	0.0-0.5	.15	.15			
	72-80	80-97	1-8	1-7	1.50-1.60	141.00-705.00	0.02-0.08	0.0-1.0	0.0-0.5	.15	.15			
NdA:														
Nona-----------------	0-3	25-65	25-60	1-8	1.25-1.50	1.40-4.00	0.12-0.18	0.0-2.9	1.0-2.0	.43	.43	5	5	56
	3-19	25-65	30-60	1-10	1.30-1.50	1.40-4.00	0.12-0.18	0.0-2.9	0.5-1.5	.43	.43			
	19-38	25-50	25-55	15-38	1.30-1.50	0.42-1.40	0.12-0.18	0.0-2.9	0.3-0.8	.37	.37			
	38-80	25-60	30-55	15-35	1.30-1.50	0.42-1.40	0.12-0.18	0.0-2.9	0.3-0.8	.37	.37			
Dallardsville--------	0-7	35-75	20-55	1-8	1.35-1.45	4.00-14.00	0.11-0.24	0.5-2.5	0.5-1.5	.49	.49	5	3	86
	7-38	35-75	20-55	1-8	1.35-1.45	4.00-14.00	0.11-0.24	0.5-4.0	0.0-1.0	.49	.49			
	38-61	35-75	20-55	8-18	1.45-1.60	1.40-4.00	0.11-0.24	0.2-1.5	0.0-0.5	.49	.49			
	61-75	40-75	20-55	10-18	1.55-1.70	1.40-4.00	0.11-0.24	0.5-2.0	0.0-0.5	.49	.49			
	75-80	35-75	20-55	10-18	1.55-1.70	0.01-0.40	0.11-0.24	0.5-2.0	0.0-0.5	.49	.49			
Oa:														
Oil-waste land-------	0-80	---	---	---	---	0.42-141.00	---	---	---	---	---	--	---	---
OeA:														
Olive----------------	0-14	35-60	40-60	1-5	0.55-1.20	4.00-42.00	0.13-0.24	1.0-2.0	4.0-8.0	.24	.24	3	5	56
	14-22	35-60	40-60	1-5	1.45-1.65	0.42-4.00	0.13-0.24	0.5-1.0	0.5-2.0	.49	.49			
	22-65	35-60	35-60	2-12	1.80-1.95	0.14-0.42	0.07-0.11	0.2-1.0	0.0-1.5	.49	.49			
	65-80	35-60	35-60	2-12	1.80-1.95	0.14-0.42	0.05-0.11	0.2-1.0	0.0-1.5	.49	.49			
OvA:														
Olive----------------	0-14	35-60	40-60	1-5	0.55-1.20	4.00-42.00	0.13-0.24	1.0-2.0	4.0-8.0	.24	.24	3	5	56
	14-22	35-60	40-60	1-5	1.45-1.65	0.42-4.00	0.13-0.24	0.5-1.0	0.5-2.0	.49	.49			
	22-65	35-60	35-60	2-12	1.80-1.95	0.14-0.42	0.07-0.11	0.2-1.0	0.0-1.5	.49	.49			
	65-80	35-60	35-60	2-12	1.80-1.95	0.14-0.42	0.05-0.11	0.2-1.0	0.0-1.5	.49	.49			
Dallardsville--------	0-7	35-75	20-55	1-8	1.35-1.45	4.00-14.00	0.11-0.24	0.5-2.5	0.5-1.5	.49	.49	5	3	86
	7-38	35-75	20-55	1-8	1.35-1.45	4.00-14.00	0.11-0.24	0.5-4.0	0.0-1.0	.49	.49			
	38-61	35-75	20-55	8-18	1.45-1.60	1.40-4.00	0.11-0.24	0.2-1.5	0.0-0.5	.49	.49			
	61-75	40-75	20-55	10-18	1.55-1.70	1.40-4.00	0.11-0.24	0.5-2.0	0.0-0.5	.49	.49			
	75-80	35-75	20-55	10-18	1.55-1.70	0.01-0.40	0.11-0.24	0.5-2.0	0.0-0.5	.49	.49			

Table 15.--Physical Properties of the Soil--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
OyB:														
Otanya---------------	0-5	55-75	15-40	3-18	1.40-1.60	14.00-42.00	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	5-23	55-75	15-40	3-18	1.40-1.60	4.00-14.00	0.10-0.15	0.0-2.9	0.1-0.8	.28	.28			
	23-44	40-65	10-40	20-35	1.50-1.65	1.41-4.00	0.12-0.18	0.0-2.9	0.1-0.5	.28	.32			
	44-74	40-65	10-40	20-35	1.50-1.65	1.41-4.00	0.12-0.18	0.0-2.9	0.1-0.5	.28	.32			
	74-80	40-65	10-40	20-35	1.50-1.65	1.41-4.00	0.12-0.18	0.0-2.9	0.1-0.5	.28	.32			
OyC:														
Otanya---------------	0-6	55-75	15-40	3-18	1.40-1.60	14.00-42.00	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	6-12	55-75	15-40	3-18	1.40-1.60	4.00-14.00	0.10-0.15	0.0-2.9	0.1-0.8	.28	.28			
	12-19	40-65	10-40	20-35	1.50-1.65	1.41-4.00	0.12-0.18	0.0-2.9	0.1-0.5	.28	.32			
	19-28	40-65	10-40	20-35	1.50-1.65	1.41-4.00	0.12-0.18	0.0-2.9	0.1-0.5	.28	.32			
	28-80	40-65	10-40	20-35	1.50-1.65	1.41-4.00	0.12-0.18	0.0-2.9	0.1-0.5	.28	.32			
PkA:														
Plank----------------	0-3	20-55	40-75	2-12	1.50-1.70	4.00-14.00	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43	5	5	56
	3-35	20-55	45-75	2-15	1.50-1.70	0.42-1.40	0.11-0.15	0.0-2.9	0.2-0.5	.43	.43			
	35-80	20-50	40-75	2-15	1.50-1.70	0.42-1.40	0.11-0.15	0.0-2.9	0.2-0.5	.43	.43			
SbC:														
Silsbee--------------	0-5	55-80	15-35	1-6	1.45-1.60	14.00-42.00	0.11-0.20	1.0-1.5	1.0-2.0	.37	.37	5	2	86
	5-15	55-80	15-35	1-6	1.55-1.66	14.00-42.00	0.11-0.20	1.0-1.5	0.5-1.0	.43	.43			
	15-49	40-65	15-35	18-30	1.55-1.71	4.23-14.00	0.11-0.20	1.0-2.0	0.0-0.5	.32	.32			
	49-58	40-65	10-35	18-33	1.60-1.70	4.23-14.00	0.11-0.20	1.0-2.0	0.0-0.5	.28	.28			
	58-80	40-70	10-35	18-30	1.60-1.71	4.23-14.00	0.11-0.20	1.0-2.0	0.0-0.5	.24	.24			
SbD:														
Silsbee--------------	0-5	55-80	15-35	1-6	1.45-1.60	14.00-42.00	0.11-0.20	1.0-1.5	1.0-2.0	.37	.37	5	2	86
	5-15	55-80	15-35	1-6	1.55-1.66	14.00-42.00	0.11-0.20	1.0-1.5	0.5-1.0	.43	.43			
	15-49	40-65	15-35	18-30	1.55-1.71	1.40-4.00	0.11-0.20	1.0-2.0	0.0-0.5	.32	.32			
	49-58	40-65	10-35	18-33	1.60-1.70	1.40-4.00	0.11-0.20	1.0-2.0	0.0-0.5	.28	.28			
	58-80	40-70	10-35	18-30	1.60-1.71	1.40-4.00	0.11-0.20	1.0-2.0	0.0-0.5	.24	.24			
SdA:														
Sorter---------------	0-3	30-60	35-60	1-10	1.20-1.50	28.00-56.00	0.15-0.20	0.0-2.9	0.2-3.0	.49	.49	3	5	86
	3-41	30-60	35-60	1-10	1.50-1.85	6.00-28.00	0.15-0.20	0.0-2.9	0.2-0.5	.49	.49			
	41-78	30-60	35-60	3-18	1.50-1.85	0.42-1.40	0.15-0.20	0.0-2.9	0.2-0.5	.49	.49			
	78-80	30-60	35-60	3-18	1.50-1.85	0.42-1.40	0.15-0.20	0.0-2.9	0.1-0.2	.49	.49			

Table 15.--Physical Properties of the Soil--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Dallardsville--------	0-7	35-75	20-55	1-8	1.35-1.45	4.00-14.00	0.11-0.24	0.5-2.5	0.5-1.5	.49	.49	5	3	86
	7-38	35-75	20-55	1-8	1.35-1.45	4.00-14.00	0.11-0.24	0.5-4.0	0.0-1.0	.49	.49			
	38-61	35-75	20-55	8-18	1.45-1.60	1.40-4.00	0.11-0.24	0.2-1.5	0.0-0.5	.49	.49			
	61-75	40-75	20-55	10-18	1.55-1.70	1.40-4.00	0.11-0.24	0.5-2.0	0.0-0.5	.49	.49			
	75-80	35-75	20-55	10-18	1.55-1.70	0.01-0.40	0.11-0.24	0.5-2.0	0.0-0.5	.49	.49			
SpB:														
Spurger--------------	0-5	35-65	25-45	6-15	1.20-1.35	28.00-56.00	0.11-0.17	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	5-11	35-65	25-45	6-15	1.20-1.35	28.00-56.00	0.11-0.17	0.0-2.9	0.5-2.0	.37	.37			
	11-58	10-30	20-40	35-60	1.20-1.50	0.42-1.40	0.12-0.18	6.0-10.0	0.2-0.5	.32	.32			
	58-74	35-65	10-35	18-35	1.30-1.50	1.40-4.00	0.12-0.17	3.0-9.0	0.1-0.5	.32	.32			
	74-80	60-90	5-25	2-20	1.30-1.65	4.00-42.00	0.05-0.15	0.0-2.9	0.1-0.5	.32	.32			
TuB:														
Turkey---------------	0-5	85-95	2-10	1-7	1.40-1.55	14.00-42.00	0.02-0.10	0.0-1.5	1.0-2.0	.15	.15	5	1	180
	5-10	85-95	2-10	1-7	1.55-1.70	14.00-42.00	0.02-0.10	0.0-1.5	0.0-1.0	.15	.15			
	10-80	85-95	2-10	1-7	1.55-1.70	14.00-42.00	0.02-0.10	0.0-1.5	0.0-0.5	.15	.15			
TyA:														
Tyden----------------	0-6	30-60	40-65	1-6	1.40-1.50	4.00-42.00	0.24-0.40	1.0-3.0	5.0-12	.49	.49	5	5	56
	6-13	30-60	40-65	1-6	1.55-1.70	0.42-4.00	0.11-0.24	0.5-1.5	0.5-1.5	.49	.49			
	13-19	30-60	35-65	1-6	1.65-1.85	0.42-1.40	0.11-0.24	0.5-1.5	0.0-0.5	.49	.49			
	19-41	30-60	35-65	3-10	1.65-1.80	0.42-1.40	0.11-0.24	0.5-1.5	0.0-0.5	.49	.49			
	41-73	40-60	35-60	3-10	1.65-1.80	0.42-1.40	0.11-0.24	0.5-1.5	0.0-0.5	.49	.49			
	73-80	40-60	20-50	5-22	1.65-1.80	0.42-1.40	0.11-0.24	1.0-2.0	0.0-0.5	.49	.49			
Babco----------------	0-8	70-85	10-30	1-5	1.30-1.45	42.00-141.00	0.16-0.24	0.0-1.0	2.0-5.0	.24	.24	5	2	134
	8-12	70-85	10-30	1-5	1.30-1.45	42.00-141.00	0.16-0.24	0.0-1.0	2.0-5.0	.24	.24			
	12-16	55-75	15-30	1-6	1.65-1.85	1.40-4.00	0.07-0.15	0.0-1.0	0.0-0.5	.43	.43			
	16-22	55-75	15-35	2-8	1.70-1.90	1.40-4.00	0.07-0.18	0.0-1.0	0.0-0.5	.43	.43			
	22-55	45-75	15-50	3-13	1.70-1.90	1.40-4.00	0.07-0.18	0.0-1.0	0.0-0.5	.37	.37			
	55-80	45-75	15-50	3-13	1.80-1.95	1.40-4.00	0.07-0.18	0.0-1.0	0.0-0.5	.37	.37			
VaA:														
Vamont---------------	0-5	5-15	25-40	45-60	1.15-1.35	0.01-0.40	0.12-0.18	9.0-25.0	1.0-3.0	.32	.32	5	4	86
	5-19	5-15	25-40	45-60	1.25-1.45	0.01-0.40	0.12-0.18	9.0-25.0	1.0-2.0	.32	.32			
	19-80	5-15	25-40	45-60	1.30-1.50	0.01-0.40	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			

Table 15.--Physical Properties of the Soil--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
VoA:														
Votaw----------------	0-4	85-97	2-8	0-5	1.00-1.35	14.00-42.00	0.05-0.08	0.0-0.8	1.0-2.0	.15	.15	5	1	250
	4-29	85-97	2-8	0-5	1.50-1.60	14.00-42.00	0.05-0.08	0.0-0.8	0.0-0.5	.15	.15			
	29-63	85-97	2-8	0-5	1.50-1.60	14.00-42.00	0.05-0.08	0.0-0.8	0.0-0.5	.15	.15			
	63-80	85-97	2-8	0-5	1.40-1.60	14.00-42.00	0.05-0.08	0.0-0.8	0.0-0.5	.15	.15			
W:														
Water----------------	---	---	---	---	---	---	---	---	---	---	---	--	---	---
WdA:														
Waller---------------	0-3	30-60	40-60	5-15	1.55-1.70	4.00-14.00	0.15-0.20	0.0-2.9	0.1-1.0	.43	.43	5	5	56
	3-30	30-55	40-60	5-15	1.55-1.70	4.00-14.00	0.15-0.20	0.0-2.9	0.1-1.0	.43	.43			
	30-56	30-60	20-50	18-30	1.50-1.70	0.42-1.40	0.15-0.20	0.0-2.9	0.1-1.0	.37	.37			
	56-65	30-60	20-50	18-30	1.50-1.70	0.42-1.40	0.15-0.20	0.0-2.9	0.1-1.0	.37	.37			
	65-80	30-60	20-50	18-30	1.50-1.70	0.42-1.40	0.15-0.20	0.0-2.9	0.1-1.0	.37	.37			
Dallardsville--------	0-7	35-75	20-55	1-8	1.35-1.45	4.00-14.00	0.11-0.24	0.5-2.5	0.5-1.5	.49	.49	5	3	86
	7-38	35-75	20-55	1-8	1.35-1.45	4.00-14.00	0.11-0.24	0.5-4.0	0.0-1.0	.49	.49			
	38-61	35-75	20-55	8-18	1.45-1.60	1.40-4.00	0.11-0.24	0.2-1.5	0.0-0.5	.49	.49			
	61-75	40-75	20-55	10-18	1.55-1.70	1.40-4.00	0.11-0.24	0.5-2.0	0.0-0.5	.49	.49			
	75-80	35-75	20-55	10-18	1.55-1.70	0.01-0.40	0.11-0.24	0.5-2.0	0.0-0.5	.49	.49			

Table 16.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
AnA:								
Anahuac	0-8	5.0-10	5.0-10	4.5-5.5	0	0	0.0-2.0	0-1
	8-19	5.0-10	5.0-10	4.5-5.5	0	0	0.0-2.0	0-1
	19-32	5.0-10	5.0-15	4.5-5.5	0	0	0.0-2.0	0-4
	32-49	15-25	5.0-15	5.1-6.5	0	0	0.0-2.0	0-4
	49-72	15-25	5.0-15	5.1-6.5	0	0	0.0-2.0	0-4
	72-80	15-25	5.0-15	5.1-6.5	0	0	0.0-2.0	0-6
Aris	0-6	10-20	---	4.5-5.5	0	0	0	0
	6-15	10-20	---	4.5-5.5	0	0	0	0
	15-24	10-20	---	4.5-5.5	0	0	0.0-2.0	0-4
	24-80	15-25	---	4.5-6.0	0-3	0-3	0.0-2.0	0-6
ArA:								
Aris	0-6	10-20	---	4.5-5.5	0	0	0	0
	6-15	10-20	---	4.5-5.5	0	0	0	0
	15-24	10-20	---	4.5-5.5	0	0	0.0-2.0	0-4
	24-80	15-25	---	4.5-6.0	0-3	0-3	0.0-2.0	0-6
Levac	0-4	18-25	---	6.1-7.3	0	0	0.0-2.0	0-2
	4-13	18-25	---	6.1-7.8	0	0	0.0-2.0	0-2
	13-17	25-35	---	6.6-7.8	0	0	0.0-2.0	0-2
	17-72	35-50	---	6.6-7.8	1-5	0	0.0-2.0	0-2
	72-80	35-50	---	6.6-8.4	0-2	0	0.0-2.0	0-2
AsA:								
Aris	0-6	10-20	---	4.5-5.5	0	0	0	0
	6-15	10-20	---	4.5-5.5	0	0	0	0
	15-24	10-20	---	4.5-5.5	0	0	0.0-2.0	0-4
	24-80	15-25	---	4.5-6.0	0-3	0-3	0.0-2.0	0-6
Spindletop	0-10	5.0-15	---	5.1-6.0	0	0	0.0-2.0	0-2
	10-21	5.0-15	---	5.1-6.5	0	0	0.0-2.0	0-2
	21-26	20-30	---	5.1-6.0	0	0	0.0-2.0	0-2
	26-34	35-50	---	6.1-7.3	0-1	0	0.0-2.0	0-2
	34-80	35-50	---	6.1-7.8	0-5	0	0.0-2.0	0-2
BaA:								
Batson	0-6	3.0-10	3.0-10	3.5-6.0	0	0	0.0-2.0	0-2
	6-29	2.0-7.0	2.0-7.0	3.5-6.0	0	0	0.0-2.0	0-4
	29-35	2.0-7.0	2.0-7.0	3.5-6.0	0	0	0.0-2.0	0-4
	35-55	5.0-12	3.0-8.0	3.5-6.0	0	0	0.0-2.0	0-2
	55-80	5.0-12	3.0-8.0	3.5-6.0	0	0	0.0-2.0	0-4
BeA:								
Beaumont	0-15	40-55	25-40	4.5-5.0	0	0	0.0-2.0	0-2
	15-38	35-45	25-40	4.5-5.5	0	0	0.0-2.0	0-2
	38-55	35-45	25-40	5.1-7.3	0-5	0-5	0.0-2.0	0-2
	55-80	35-45	25-40	5.1-7.3	0-5	0-5	0.0-2.0	0-2
BoB:								
Belrose	0-5	2.0-4.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	0-2
	5-20	2.0-4.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	0-2
	20-44	2.0-4.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	0-2
	44-63	2.0-4.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	0-2
	63-75	3.0-18	1.0-8.0	3.5-5.5	0	0	0.0-2.0	0-2
	75-80	3.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-2

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
BrA:								
Belrose	0-5	2.0-4.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	0-2
	5-20	2.0-4.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	0-2
	20-44	2.0-4.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	0-2
	44-63	2.0-4.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	0-2
	63-75	3.0-18	1.0-8.0	3.5-5.5	0	0	0.0-2.0	0-2
	75-80	3.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-2
Caneyhead	0-4	5.0-10	1.0-7.0	3.5-5.0	0	0	0.0-2.0	0-2
	4-18	3.0-10	1.0-7.0	3.5-5.0	0	0	0.0-2.0	0-2
	18-29	6.0-15	3.0-10	3.5-5.0	0	0	0.0-2.0	0-2
	29-63	10-20	5.0-15	3.5-5.0	0	0	0.0-4.0	0-4
	63-80	5.0-15	3.0-10	3.5-5.0	0	0	0.0-4.0	2-6
BvA:								
Bevil	0-4	40-55	25-40	3.5-5.0	0	0	0.0-2.0	0
	4-10	35-45	25-40	3.5-5.0	0	0	0.0-2.0	0
	10-22	35-45	25-40	4.5-6.0	0	0	0.0-2.0	0
	22-37	35-45	25-40	4.5-6.0	0	0	0.0-2.0	0
	37-80	25-40	25-40	4.5-6.0	0	0	0.0-2.0	0
CaA:								
Camptown	0-4	4.0-10	2.0-8.0	3.5-5.0	0	0	0.0-2.0	2-6
	4-13	2.0-10	2.0-8.0	3.5-5.0	0	0	0.0-2.0	2-6
	13-46	2.0-10	2.0-8.0	5.1-7.3	0	0	0.0-2.0	2-6
	46-69	10-20	2.0-15	5.1-7.3	0	0	2.0-4.0	2-12
	69-80	10-35	10-30	5.1-7.3	0	0-2	2.0-4.0	4-12
CbA:								
Camptown	0-4	4.0-10	2.0-8.0	3.5-5.0	0	0	0.0-2.0	2-6
	4-13	2.0-10	2.0-8.0	3.5-5.0	0	0	0.0-2.0	2-6
	13-46	2.0-10	2.0-8.0	5.1-7.3	0	0	0.0-2.0	2-6
	46-69	10-20	2.0-15	5.1-7.3	0	0	2.0-4.0	2-12
	69-80	10-35	10-30	5.1-7.3	0	0-2	2.0-4.0	4-12
Batson	0-6	3.0-10	3.0-10	3.5-6.0	0	0	0.0-2.0	0-2
	6-29	2.0-7.0	2.0-7.0	3.5-6.0	0	0	0.0-2.0	0-4
	29-35	2.0-7.0	2.0-7.0	3.5-6.0	0	0	0.0-2.0	0-4
	35-55	5.0-12	3.0-8.0	3.5-6.0	0	0	0.0-2.0	0-2
	55-80	5.0-12	3.0-8.0	3.5-6.0	0	0	0.0-2.0	0-4
CyA:								
Cypress	0-12	---	15-32	3.5-5.0	0	0	0.0-2.0	0-2
	12-17	---	15-35	3.5-5.0	0	0	0.0-2.0	0-2
	17-80	---	15-35	3.5-5.0	0	0	0.0-2.0	0-2
DAM:								
Dam	---	---	---	---	---	---	---	---
EsA:								
Estes	0-8	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5
	8-23	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5
	23-31	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5
	31-62	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5
	62-80	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5
EtA:								
Estes	0-8	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5
	8-23	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5
	23-31	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5
	31-62	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5
	62-80	---	20-35	4.5-6.0	0	0	0.0-2.0	1-5

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
Angelina	0-5	---	10-25	3.5-5.0	0	0	0	0
	5-14	---	10-25	3.5-5.0	0	0	0	0
	14-29	---	10-25	3.5-5.0	0	0	0	0
	29-46	---	10-25	3.5-5.0	0	0	0	0
	46-67	---	10-25	3.5-5.0	0	0	0	0
	67-80	---	10-25	3.5-5.0	0	0	0	0
EvA:								
Evadale	0-5	7.0-20	5.0-15	3.5-5.5	0	0	0.0-4.0	0-4
	5-16	7.0-20	5.0-15	3.5-5.5	0	0	0.0-4.0	0-4
	16-25	7.0-20	5.0-15	3.5-5.0	0	0	0.0-4.0	0-4
	25-41	20-35	15-30	3.5-6.0	0	0	2.0-8.0	2-8
	41-80	20-35	15-30	3.5-6.0	0	0-2	2.0-8.0	4-12
EwA:								
Evadale	0-5	7.0-20	5.0-15	3.5-5.5	0	0	0.0-4.0	0-4
	5-16	7.0-20	5.0-15	3.5-5.5	0	0	0.0-4.0	0-4
	16-25	7.0-20	5.0-15	3.5-5.0	0	0	0.0-4.0	0-4
	25-41	20-35	15-30	3.5-6.0	0	0	2.0-8.0	2-8
	41-80	20-35	15-30	3.5-6.0	0	0-2	2.0-8.0	4-12
Gist	0-4	2.0-10	1.0-5.0	3.5-5.0	0	0	0.0-2.0	0
	4-15	2.0-10	1.0-5.0	3.5-5.0	0	0	0.0-2.0	0
	15-41	5.0-10	1.0-5.0	3.5-5.0	0	0	0.0-2.0	0
	41-53	15-30	10-25	3.5-5.0	0	0	0.0-2.0	0
	53-80	15-30	10-25	3.5-5.0	0	0	0.0-4.0	0-2
ExA:								
Evadale	0-5	7.0-20	5.0-15	3.5-5.5	0	0	0.0-4.0	0-4
	5-16	7.0-20	5.0-15	3.5-5.5	0	0	0.0-4.0	0-4
	16-25	7.0-20	5.0-15	3.5-5.0	0	0	0.0-4.0	0-4
	25-41	20-35	15-30	3.5-6.0	0	0	2.0-8.0	2-8
	41-80	20-35	15-30	3.5-6.0	0	0-2	2.0-8.0	4-12
Texla	0-5	10-20	5.0-25	3.5-5.0	0	0	0.0-2.0	0-2
	5-11	5.0-15	2.0-20	3.5-5.0	0	0	0.0-2.0	0-2
	11-17	5.0-15	2.0-20	3.5-5.5	0	0	0.0-2.0	0-4
	17-38	5.0-35	5.0-30	3.5-5.6	0	0	0.0-2.0	0-4
	38-80	20-35	15-30	4.5-6.0	0	0-2	2.0-8.0	4-12
IbA:								
Iulus	0-4	---	2.0-10	3.5-5.0	0	0	0.0-2.0	0
	4-18	---	2.0-10	3.5-5.0	0	0	0.0-2.0	0
	18-58	---	2.0-10	3.5-5.0	0	0	0.0-2.0	0
	58-80	---	5.0-15	3.5-5.0	0	0	0.0-2.0	0
Bleakwood	0-3	---	7.0-20	4.5-5.5	0	0	0	0
	3-14	---	7.0-20	4.5-5.5	0	0	0	0
	14-58	---	7.0-20	4.5-5.5	0	0	0	0
	58-80	---	7.0-20	4.5-5.5	0	0	0	0
JaA:								
Jasco	0-4	---	2.0-10	3.5-5.5	0	0	0	0
	4-15	---	2.0-10	3.5-5.5	0	0	0	0
	15-44	---	5.0-10	3.5-5.5	0	0	0	0
	44-80	---	5.0-10	3.5-5.5	0	0	0	0

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
JhA:								
Jayhawker	0-6	1.0-7.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	2-4
	6-36	1.0-7.0	1.0-3.0	3.5-5.5	0	0	0.0-2.0	2-4
	36-69	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	2-4
	69-80	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	2-4
KeB:								
Kenefick	0-3	7.0-20	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	3-26	7.0-20	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	26-55	15-35	15-35	4.5-6.0	0	0	0.0-2.0	0
	55-80	10-20	10-20	4.5-6.0	0	0	0.0-2.0	0
KfA:								
Kenefick	0-3	7.0-20	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	3-26	7.0-20	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	26-55	15-35	15-35	4.5-6.0	0	0	0.0-2.0	0
	55-80	10-20	10-20	4.5-6.0	0	0	0.0-2.0	0
Caneyhead	0-4	5.0-10	1.0-7.0	3.5-5.0	0	0	0.0-2.0	0-2
	4-18	3.0-10	1.0-7.0	3.5-5.0	0	0	0.0-2.0	0-2
	18-29	6.0-15	3.0-10	3.5-5.0	0	0	0.0-2.0	0-2
	29-63	10-20	5.0-15	3.5-5.0	0	0	0.0-4.0	0-4
	63-80	5.0-15	3.0-10	3.5-5.0	0	0	0.0-4.0	2-6
KrB:								
Kirbyville	0-5	4.0-10	2.0-7.0	3.5-5.0	0	0	0	0-2
	5-18	4.0-10	2.0-7.0	3.5-5.0	0	0	0	0-2
	18-25	4.0-12	2.0-10	4.5-5.5	0	0	0	0-2
	25-60	4.0-12	2.0-10	4.5-5.5	0	0	0	0-2
	60-80	4.0-12	2.0-10	4.5-5.5	0	0	0	0-2
KwA:								
Kirbyville	0-5	4.0-10	2.0-7.0	3.5-5.0	0	0	0	0-2
	5-18	4.0-10	2.0-7.0	3.5-5.0	0	0	0	0-2
	18-25	4.0-12	2.0-10	4.5-5.5	0	0	0	0-2
	25-60	4.0-12	2.0-10	4.5-5.5	0	0	0	0-2
	60-80	4.0-12	2.0-10	4.5-5.5	0	0	0	0-2
Niwana	0-3	1.0-10	1.0-5.0	4.5-5.5	0	0	0	0-2
	3-17	1.0-10	1.0-5.0	4.5-5.5	0	0	0	0-2
	17-80	5.0-20	1.0-10	4.5-5.5	0	0	0	0-2
KzB:								
Kountze	0-6	2.0-7.0	1.0-4.0	4.5-5.5	0	0	0.0-2.0	0-2
	6-17	2.0-7.0	1.0-4.0	4.5-5.5	0	0	0.0-2.0	0-2
	17-25	2.0-7.0	1.0-4.0	4.5-5.5	0	0	0.0-2.0	0-2
	25-43	2.0-8.0	1.0-5.0	4.5-5.5	0	0	0.0-2.0	0-2
	43-54	2.0-8.0	1.0-5.0	4.5-5.5	0	0	0.0-2.0	0-2
	54-80	2.0-8.0	1.0-5.0	4.5-5.5	0	0	0.0-2.0	0-2
LdA:								
Labelle	0-9	18-25	---	5.1-6.5	0	0	0.0-2.0	0-2
	9-16	30-40	---	5.6-7.3	0	0	0.0-2.0	0-2
	16-24	35-50	---	5.6-7.3	0-1	0	0.0-2.0	0-2
	24-64	35-50	---	5.6-7.3	0-1	0	0.0-2.0	0-2
	64-80	35-50	---	6.1-7.8	2-5	0	0.0-2.0	0-2
Levac	0-4	18-25	---	6.1-7.3	0	0	0.0-2.0	0-2
	4-13	18-25	---	6.1-7.8	0	0	0.0-2.0	0-2
	13-17	25-35	---	6.6-7.8	0	0	0.0-2.0	0-2
	17-72	35-50	---	6.6-7.8	1-5	0	0.0-2.0	0-2
	72-80	35-50	---	6.6-8.4	0-2	0	0.0-2.0	0-2

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
LsA:								
Labelle	0-9	18-25	---	5.1-6.5	0	0	0.0-2.0	0-2
	9-16	30-40	---	5.6-7.3	0	0	0.0-2.0	0-2
	16-24	35-50	---	5.6-7.3	0-1	0	0.0-2.0	0-2
	24-64	35-50	---	5.6-7.3	0-1	0	0.0-2.0	0-2
	64-80	35-50	---	6.1-7.8	2-5	0	0.0-2.0	0-2
Spindletop	0-10	5.0-15	---	5.1-6.0	0	0	0.0-2.0	0-2
	10-21	5.0-15	---	5.1-6.5	0	0	0.0-2.0	0-2
	21-26	20-30	---	5.1-6.0	0	0	0.0-2.0	0-2
	26-34	35-50	---	6.1-7.3	0-1	0	0.0-2.0	0-2
	34-80	35-50	---	6.1-7.8	0-5	0	0.0-2.0	0-2
LtA:								
League	0-13	25-50	25-40	3.5-5.5	0	0	0.0-4.0	0-4
	13-28	25-40	25-40	4.5-5.5	0	0	0.0-4.0	0-4
	28-45	25-40	25-40	4.5-5.5	0	0	0.0-4.0	0-4
	45-80	25-40	25-40	5.1-7.3	0-1	0-4	0.0-4.0	0-4
LvA:								
Lelavale	0-4	3.0-10	1.0-8.0	3.5-4.4	0	0	0.0-4.0	2-8
	4-12	3.0-15	2.0-11	3.5-4.4	0	0	0.0-4.0	2-8
	12-16	3.0-15	2.0-11	3.5-4.4	0	0	0.0-4.0	2-8
	16-41	7.0-25	5.0-21	3.5-4.4	0	0	0.0-4.0	2-8
	41-49	20-30	18-29	3.5-4.4	0	0	0.0-4.0	2-8
	49-57	15-30	15-29	3.5-4.4	0	0	0.0-4.0	2-8
	57-80	15-30	15-29	3.5-4.4	0	0	0.0-4.0	2-8
LwA:								
Leton	0-4	5.0-15	---	5.1-7.3	0	0	0	0
	4-28	5.0-15	---	5.1-7.3	0	0	0	0
	28-49	15-25	---	5.6-8.4	0	0	0	0
	49-80	15-25	---	5.6-8.4	0	0	0	0
MaA:								
Manco	0-4	---	10-15	3.5-5.0	0	0	0.0-2.0	0-2
	4-19	---	5.0-15	3.5-5.0	0	0	0.0-2.0	0-4
	19-45	---	10-15	3.5-5.0	0	0	0.0-2.0	0-4
	45-80	---	10-15	3.5-5.0	0	0	0.0-2.0	0-4
McC:								
McNeely	0-5	1.0-5.0	0.5-4.5	4.5-5.5	0	0	0	0
	5-37	0.0-1.0	0.0-1.0	4.5-5.5	0	0	0	0
	37-72	0.0-1.0	0.0-1.0	4.5-5.5	0	0	0	0
	72-80	0.0-1.0	0.0-1.0	4.5-5.5	0	0	0	0
NdA:								
Nona	0-3	2.0-8.0	1.0-5.0	3.5-5.0	0	0	0.0-2.0	2-6
	3-19	2.0-10	1.0-8.0	3.5-5.0	0	0	0.0-2.0	2-10
	19-80	10-25	5.0-20	3.5-5.0	0	0	0.0-4.0	6-10
	19-80	10-25	5.0-20	3.5-5.0	0	0	0.0-4.0	6-10
Dallardsville	0-7	1.0-5.0	0.5-4.0	3.5-5.5	0	0	0	0
	7-38	1.0-5.0	0.5-4.0	3.5-5.5	0	0	0	0
	38-61	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0	0
	61-75	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-2
	75-80	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-4
Oa:								
Oil-waste land	0-80	---	---	---	---	---	---	---

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
OeA:								
Olive----------------	0-14	6.0-15	1.0-6.0	3.1-4.4	0	0	0	0-2
	14-22	2.0-7.0	1.0-4.0	3.1-4.4	0	0	0	0-2
	22-65	1.0-6.0	0.1-2.0	3.5-5.0	0	0	0.0-2.0	0-2
	65-80	1.0-6.0	0.1-2.0	3.5-5.0	0	0	0.0-2.0	0-2
OvA:								
Olive----------------	0-14	6.0-15	1.0-6.0	3.1-4.4	0	0	0	0-2
	14-22	2.0-7.0	1.0-4.0	3.1-4.4	0	0	0	0-2
	22-65	1.0-6.0	0.1-2.0	3.5-5.0	0	0	0.0-2.0	0-2
	65-80	1.0-6.0	0.1-2.0	3.5-5.0	0	0	0.0-2.0	0-2
Dallardsville--------	0-7	1.0-5.0	0.5-4.0	3.5-5.5	0	0	0	0
	7-38	1.0-5.0	0.5-4.0	3.5-5.5	0	0	0	0
	38-61	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0	0
	61-75	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-2
	75-80	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-4
OyB:								
Otanya---------------	0-6	2.0-7.0	1.0-5.0	3.5-5.0	0	0	0.0-2.0	0-2
	6-12	2.0-7.0	1.0-5.0	3.5-5.0	0	0	0.0-2.0	0-2
	12-19	3.0-12	2.0-10	3.5-5.0	0	0	0.0-2.0	0-2
	19-28	4.0-12	2.0-10	3.5-5.0	0	0	0.0-2.0	0-2
	28-80	4.0-12	2.0-10	3.5-5.0	0	0	0.0-2.0	0-2
OyC:								
Otanya---------------	0-6	2.0-7.0	1.0-5.0	3.5-5.0	0	0	0.0-2.0	0-2
	6-12	2.0-7.0	1.0-5.0	3.5-5.0	0	0	0.0-2.0	0-2
	12-19	3.0-12	2.0-10	3.5-5.0	0	0	0.0-2.0	0-2
	19-28	4.0-12	2.0-10	3.5-5.0	0	0	0.0-2.0	0-2
	28-80	4.0-12	2.0-10	3.5-5.0	0	0	0.0-2.0	0-2
PkA:								
Plank----------------	0-3	2.0-8.0	1.0-4.0	3.5-4.4	0	0	2.0-4.0	2-10
	3-35	1.0-5.0	1.0-3.0	3.5-5.0	0	0	2.0-4.0	2-10
	35-80	1.0-5.0	1.0-3.0	3.5-5.0	0	0	2.0-4.0	2-10
SbC:								
Silsbee--------------	0-5	2.0-6.0	1.0-5.0	3.5-5.5	0	0	0	0
	5-15	2.0-5.0	1.0-4.0	3.5-5.5	0	0	0	0
	15-49	3.0-10	3.0-7.0	3.5-5.5	0	0	0	0-2
	49-58	3.0-10	2.0-7.0	3.5-5.5	0	0	0	0-2
	58-80	3.0-10	2.0-7.0	3.5-5.5	0	0	0.0-2.0	0-2
SbD:								
Silsbee--------------	0-5	2.0-6.0	1.0-5.0	3.5-5.5	0	0	0	0
	5-15	2.0-5.0	1.0-4.0	3.5-5.5	0	0	0	0
	15-49	3.0-10	3.0-7.0	3.5-5.5	0	0	0	0-2
	49-58	3.0-10	2.0-7.0	3.5-5.5	0	0	0	0-2
	58-80	3.0-10	2.0-7.0	3.5-5.5	0	0	0.0-2.0	0-2
SdA:								
Sorter---------------	0-3	4.0-7.0	1.0-5.0	3.5-5.0	0	0	0.0-2.0	2-8
	3-41	4.0-7.0	1.0-5.0	3.5-5.0	0	0	0.0-2.0	6-12
	41-78	4.0-7.0	1.0-5.0	4.5-6.0	0	0	0.0-2.0	6-12
	78-80	8.0-12	1.0-8.0	4.5-6.5	0	0	0.0-2.0	6-12
Dallardsville--------	0-7	1.0-5.0	0.5-4.0	3.5-5.5	0	0	0	0
	7-38	1.0-5.0	0.5-4.0	3.5-5.5	0	0	0	0
	38-61	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0	0
	61-75	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-2
	75-80	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-4

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
SpB:								
Spurger	0-5	1.0-5.0	---	4.5-6.0	0	0	0	0
	5-11	1.0-5.0	---	4.5-6.0	0	0	0	0
	11-58	---	20-30	4.5-6.0	0	0	0	0
	58-74	---	15-25	4.5-6.0	0	0	0	0
	74-80	4.0-10	---	4.5-6.0	0	0	0	0
TuB:								
Turkey	0-5	1.0-5.0	0.5-4.0	3.5-5.5	0	0	0	0
	5-10	1.0-4.0	0.2-3.0	3.5-5.5	0	0	0	0
	10-80	1.0-3.0	0.1-2.0	3.5-5.5	0	0	0	0
TyA:								
Tyden	0-6	10-25	2.0-10	3.5-5.0	0	0	0	0
	6-13	3.0-7.0	1.0-6.0	3.5-5.0	0	0	0	0
	13-19	1.0-5.0	0.5-4.0	3.5-5.0	0	0	0	0
	19-41	1.0-8.0	0.5-4.0	3.5-5.0	0	0	0.0-2.0	0-2
	41-73	1.0-8.0	0.5-4.0	3.5-5.0	0	0	0.0-2.0	0-2
	73-80	1.0-10	1.0-4.0	3.5-5.0	0	0	0.0-2.0	0-2
Babco	0-8	5.0-12	1.0-7.0	3.5-5.0	0	0	0	0
	8-12	5.0-12	1.0-7.0	3.5-5.0	0	0	0	0
	12-16	0.2-5.0	0.2-2.0	3.5-5.0	0	0	0	0
	16-22	0.2-5.0	0.2-2.0	3.5-5.0	0	0	0.0-2.0	0
	22-55	1.0-5.0	0.5-2.0	3.5-5.0	0	0	0.0-2.0	0
	55-80	1.0-5.0	0.5-2.0	3.5-5.0	0	0	0.0-2.0	0
VaA:								
Vamont	0-5	25-40	15-35	3.5-5.5	0	0	0.0-2.0	0
	5-19	25-40	15-35	3.5-5.5	0	0	0.0-2.0	0-2
	19-80	25-40	15-35	3.5-5.5	0	0	0.0-2.0	0-2
VoA:								
Votaw	0-4	1.0-5.0	0.1-3.0	4.5-6.0	0	0	0.0-2.0	0-4
	4-29	1.0-3.0	0.1-1.0	4.5-6.0	0	0	0.0-2.0	2-6
	29-63	0.5-3.0	0.1-1.0	4.5-6.0	0	0	0.0-2.0	2-8
	63-80	0.5-2.0	0.1-1.0	4.5-6.0	0	0	0.0-2.0	2-8
W:								
Water	---	---	---	---	---	---	---	---
WdA:								
Waller	0-3	---	2.0-10	3.5-5.5	0	0	0.0-2.0	0-2
	3-30	---	2.0-10	3.5-5.5	0	0	0.0-2.0	0-2
	30-56	10-20	5.0-15	3.5-5.5	0	0	0.0-2.0	0-2
	56-65	10-25	5.0-15	3.5-5.5	0	0	0.0-2.0	0-4
	65-80	10-25	5.0-15	3.5-5.5	0	0	0.0-2.0	0-4
Dallardsville	0-7	1.0-5.0	0.5-4.0	3.5-5.5	0	0	0	0
	7-38	1.0-5.0	0.5-4.0	3.5-5.5	0	0	0	0
	38-61	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0	0
	61-75	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-2
	75-80	1.0-7.0	1.0-5.0	3.5-5.5	0	0	0.0-2.0	0-4

Table 17.--Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
AnA:									
Anahuac-------------------	D								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	4.0-6.0	>6.0	---	---	None	---	None
		March	4.0-6.0	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		November	4.0-6.0	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
Aris----------------------	D								
		January	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
		February	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
		March	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
		April	---	---	0.0-0.5	Long	Occasional	---	None
		May	---	---	0.0-0.5	Brief	Occasional	---	None
		June	---	---	0.0-0.5	Very brief	Rare	---	None
		July	---	---	0.0-0.5	Very brief	Rare	---	None
		August	---	---	0.0-0.5	Very brief	Rare	---	None
		September	---	---	0.0-0.5	Brief	Occasional	---	None
		October	---	---	0.0-0.5	Brief	Occasional	---	None
		November	0.0-2.0	1.0-2.5	0.0-0.5	Brief	Frequent	---	None
		December	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
ArA:									
Aris----------------------	D								
		January	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
		February	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
		March	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
		April	---	---	0.0-0.5	Long	Occasional	---	None
		May	---	---	0.0-0.5	Brief	Occasional	---	None
		June	---	---	0.0-0.5	Very brief	Rare	---	None
		July	---	---	0.0-0.5	Very brief	Rare	---	None
		August	---	---	0.0-0.5	Very brief	Rare	---	None
		September	---	---	0.0-0.5	Brief	Occasional	---	None
		October	---	---	0.0-0.5	Brief	Occasional	---	None
		November	0.0-2.0	1.0-2.5	0.0-0.5	Brief	Frequent	---	None
		December	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Levac	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
AsA:									
Aris	D								
		January	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
		February	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
		March	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
		April	---	---	0.0-0.5	Long	Occasional	---	None
		May	---	---	0.0-0.5	Brief	Occasional	---	None
		June	---	---	0.0-0.5	Very brief	Rare	---	None
		July	---	---	0.0-0.5	Very brief	Rare	---	None
		August	---	---	0.0-0.5	Very brief	Rare	---	None
		September	---	---	0.0-0.5	Brief	Occasional	---	None
		October	---	---	0.0-0.5	Brief	Occasional	---	None
		November	0.0-2.0	1.0-2.5	0.0-0.5	Brief	Frequent	---	None
		December	0.0-2.0	1.0-2.5	0.0-0.5	Long	Frequent	---	None
Spindletop	D								
		January	1.5-3.0	2.0-3.5	---	---	None	---	None
		February	1.5-3.0	2.0-3.5	---	---	None	---	None
		March	1.5-3.0	2.0-3.5	---	---	None	---	None
BaA:									
Batson	B								
		January	2.0-2.5	2.5-3.0	---	---	None	---	None
		February	2.0-2.5	2.5-3.0	---	---	None	---	None
		March	2.0-2.5	2.5-3.0	---	---	None	---	None
		December	2.0-2.5	2.5-3.0	---	---	None	---	None
BeA:									
Beaumont	D								
		January	0.0-1.0	0.5-2.0	---	---	None	---	None
		February	0.0-1.0	0.5-2.0	---	---	None	---	None
		March	0.0-1.0	0.5-2.0	---	---	None	---	None
		November	0.0-1.0	0.5-2.0	---	---	None	---	None
		December	0.0-1.0	0.5-2.0	---	---	None	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
BoB:									
Belrose	B								
		January	2.5-3.0	3.0-4.0	---	---	None	---	None
		February	2.5-3.0	3.0-4.0	---	---	None	---	None
		March	2.5-3.0	3.0-4.0	---	---	None	---	None
		December	2.5-3.0	3.0-4.0	---	---	None	---	None
BrA:									
Belrose	B								
		January	2.5-3.0	3.0-4.0	---	---	None	---	None
		February	2.5-3.0	3.0-4.0	---	---	None	---	None
		March	2.5-3.0	3.0-4.0	---	---	None	---	None
		December	2.5-3.0	3.0-4.0	---	---	None	---	None
Caneyhead	D								
		January	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		February	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		March	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		April	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		July	---	---	0.0-0.5	Long	Occasional	---	None
		August	---	---	0.0-0.5	Long	Occasional	---	None
		September	---	---	0.0-0.5	Long	Occasional	---	None
		October	---	---	0.0-0.5	Long	Occasional	---	None
		November	0.0	1.0-1.6	0.0-0.5	Long	Occasional	---	None
		December	0.0	1.0-1.6	0.0-0.5	Long	Frequent	---	None
BvA:									
Bevil	D								
		January	0.0-0.5	0.5-1.0	0.0-0.5	Long	Frequent	---	None
		February	0.0-0.5	0.5-1.0	0.0-0.5	Long	Frequent	---	None
		March	0.0-0.5	0.5-1.0	0.0-0.5	Brief	Frequent	---	None
		April	---	---	0.0-0.5	Brief	Occasional	---	None
		May	---	---	0.0-0.5	Brief	Occasional	---	None
		June	---	---	0.0-0.5	Brief	Rare	---	None
		July	---	---	0.0-0.5	Brief	Rare	---	None
		August	---	---	0.0-0.5	Brief	Occasional	---	None
		September	---	---	0.0-0.5	Brief	Occasional	---	None
		October	---	---	0.0-0.5	Brief	Frequent	---	None
		November	---	---	0.0-0.5	Long	Frequent	---	None
		December	---	---	0.0-0.5	Long	Frequent	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
CaA:									
Camptown	D								
		January	0.0-0.5	0.5-6.0	0.0-1.0	Long	Frequent	---	None
		February	0.0-0.5	0.5-6.0	0.0-1.0	Long	Frequent	---	None
		March	0.0-0.5	0.5-6.0	0.0-1.0	Long	Frequent	---	None
		April	0.0-0.5	0.5-6.0	0.0-1.0	Long	Occasional	---	None
		May	0.0-0.5	0.5-6.0	0.0-1.0	Long	Occasional	---	None
		June	0.0-0.5	0.5-6.0	0.0-1.0	Brief	Occasional	---	None
		July	0.0-0.5	0.5-6.0	0.0-1.0	Brief	Occasional	---	None
		August	0.0-0.5	0.5-6.0	0.0-1.0	Brief	Occasional	---	None
		September	---	---	0.0-0.5	Brief	Occasional	---	None
		October	---	---	0.0-0.5	Long	Occasional	---	None
		November	---	---	0.0-0.5	Long	Occasional	---	None
		December	0.0-0.5	0.5-6.0	0.0-1.0	Long	Frequent	---	None
CbA:									
Camptown	D								
		January	0.0-0.5	0.5-6.0	0.0-1.0	Long	Frequent	---	None
		February	0.0-0.5	0.5-6.0	0.0-1.0	Long	Frequent	---	None
		March	0.0-0.5	0.5-6.0	0.0-1.0	Long	Frequent	---	None
		April	0.0-0.5	0.5-6.0	0.0-1.0	Long	Occasional	---	None
		May	0.0-0.5	0.5-6.0	0.0-1.0	Long	Occasional	---	None
		June	0.0-0.5	0.5-6.0	0.0-1.0	Brief	Occasional	---	None
		July	0.0-0.5	0.5-6.0	0.0-1.0	Brief	Occasional	---	None
		August	0.0-0.5	0.5-6.0	0.0-1.0	Brief	Occasional	---	None
		September	---	---	0.0-0.5	Brief	Occasional	---	None
		October	---	---	0.0-0.5	Long	Occasional	---	None
		November	---	---	0.0-0.5	Long	Occasional	---	None
		December	0.0-0.5	0.5-6.0	0.0-1.0	Long	Frequent	---	None
Batson	B								
		January	2.0-2.5	2.5-3.0	---	---	None	---	None
		February	2.0-2.5	2.5-3.0	---	---	None	---	None
		March	2.0-2.5	2.5-3.0	---	---	None	---	None
		December	2.0-2.5	2.5-3.0	---	---	None	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
CyA:									
Cypress	D								
		January	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		February	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		March	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		April	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		May	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		June	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		July	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		August	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		September	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		October	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		November	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
		December	0.0	>6.0	0.0-4.0	Very long	Frequent	Very long	Frequent
EsA:									
Estes	D								
		January	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		February	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		March	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		April	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		May	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
		November	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		December	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
EtA:									
Estes	D								
		January	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		February	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		March	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		April	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		May	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
		November	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		December	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Angelina	D								
		January	0.0	>6.0	0.0-2.0	Very long	None	Very long	Frequent
		February	0.0	>6.0	0.0-2.0	Very long	None	Very long	Frequent
		March	0.0	>6.0	0.0-2.0	Very long	None	Very long	Frequent
		April	0.0	>6.0	0.0-2.0	Very long	None	Very long	Frequent
		May	0.0	>6.0	0.0-2.0	Very long	None	Very long	Frequent
		June	0.0	>6.0	0.0-2.0	Very long	None	Very long	Frequent
		October	0.0	>6.0	0.0-2.0	Very long	None	Very long	Frequent
		November	0.0	>6.0	0.0-2.0	Very long	None	Very long	Frequent
		December	0.0	>6.0	0.0-2.0	Very long	None	Very long	Frequent
EvA:									
Evadale	D								
		January	0.0-1.5	0.0-3.0	---	---	None	---	None
		February	0.0-1.5	0.0-3.0	---	---	None	---	None
		March	0.0-1.5	0.0-3.0	---	---	None	---	None
		April	0.0-1.5	0.0-3.0	---	---	None	---	None
		December	0.0-1.5	0.0-3.0	---	---	None	---	None
EwA:									
Evadale	D								
		January	0.0-1.5	0.0-3.0	---	---	None	---	None
		February	0.0-1.5	0.0-3.0	---	---	None	---	None
		March	0.0-1.5	0.0-3.0	---	---	None	---	None
		April	0.0-1.5	0.0-3.0	---	---	None	---	None
		December	0.0-1.5	0.0-3.0	---	---	None	---	None
Gist	D								
		January	2.0-3.0	2.5-4.0	---	---	None	---	None
		February	2.0-3.0	2.5-4.0	---	---	None	---	None
		March	2.0-3.0	2.5-4.0	---	---	None	---	None
		April	2.0-3.0	2.5-4.0	---	---	None	---	None
		May	2.0-3.0	2.5-4.0	---	---	None	---	None
		November	2.0-3.0	2.5-4.0	---	---	None	---	None
		December	2.0-3.0	2.5-4.0	---	---	None	---	None
ExA:									
Evadale	D								
		January	0.0-1.5	0.0-3.0	---	---	None	---	None
		February	0.0-1.5	0.0-3.0	---	---	None	---	None
		March	0.0-1.5	0.0-3.0	---	---	None	---	None
		April	0.0-1.5	0.0-3.0	---	---	None	---	None
		December	0.0-1.5	0.0-3.0	---	---	None	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Texla	D								
		January	1.0-1.5	1.5-3.0	---	---	None	---	None
		February	1.0-1.5	1.5-3.0	---	---	None	---	None
		March	1.0-1.5	1.5-3.0	---	---	None	---	None
		April	1.0-1.5	1.5-3.0	---	---	None	---	None
		May	1.0-1.5	1.5-3.0	---	---	None	---	None
		November	1.0-1.5	1.5-3.0	---	---	None	---	None
		December	1.0-1.5	1.5-3.0	---	---	None	---	None
IbA:									
Iulus	B								
		January	1.5-4.0	2.0-5.0	---	---	None	Very brief	Frequent
		February	1.5-4.0	2.0-5.0	---	---	None	Very brief	Frequent
		March	1.5-4.0	2.0-5.0	---	---	None	Very brief	Frequent
		April	1.5-4.0	2.0-5.0	---	---	None	Very brief	Frequent
		December	1.5-4.0	2.0-5.0	---	---	None	Very brief	Frequent
Bleakwood	C								
		January	0.0-1.5	>6.0	---	---	None	Long	Frequent
		February	0.0-1.5	>6.0	---	---	None	Long	Frequent
		March	0.0-1.5	>6.0	---	---	None	Long	Frequent
		April	0.0-1.5	>6.0	---	---	None	Long	Frequent
		May	0.0-1.5	>6.0	---	---	None	---	None
		September	0.0-1.5	>6.0	---	---	None	---	None
		October	0.0-1.5	>6.0	---	---	None	---	None
		November	0.0-1.5	>6.0	---	---	None	Long	Frequent
		December	0.0-1.5	>6.0	---	---	None	Long	Frequent
JaA:									
Jasco	D								
		January	0.0	>6.0	0.0-0.5	Long	None	---	None
		February	0.0	>6.0	0.0-0.5	Long	None	---	None
		March	0.0	>6.0	0.0-0.5	Long	None	---	None
		April	0.0	>6.0	0.0-0.5	Long	None	---	None
		May	0.0	>6.0	0.0-0.5	Long	None	---	None
		September	0.0	>6.0	0.0-0.5	Long	None	---	None
		October	0.0	>6.0	0.0-0.5	Long	None	---	None
		November	0.0	>6.0	0.0-0.5	Long	None	---	None
		December	0.0	>6.0	0.0-0.5	Long	None	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
JhA:									
Jayhawker	C								
		January	1.0-1.5	1.5-4.0	0.0-0.5	Long	Frequent	Extremely brief	Rare
		February	1.0-1.5	1.5-4.0	0.0-0.5	Long	Frequent	Brief	None
		March	1.0-1.5	1.5-4.0	0.0-0.5	Long	Frequent	Brief	None
		April	1.0-1.5	1.5-4.0	0.0-0.5	Long	Frequent	Brief	None
		May	1.0-1.5	1.5-4.0	0.0-0.5	Long	Frequent	Brief	None
		June	1.0-1.5	1.5-4.0	0.0-0.5	Brief	Occasional	Brief	None
		July	---	---	0.0-0.5	Brief	Occasional	Brief	None
		August	---	---	0.0-0.5	Brief	Occasional	Brief	None
		September	---	---	0.0-0.5	Brief	Occasional	Brief	None
		October	1.0-1.5	1.5-4.0	0.0-0.5	Brief	Occasional	Brief	None
		November	1.0-1.5	1.5-4.0	0.0-0.5	Long	Frequent	Brief	None
		December	1.0-1.5	1.5-4.0	0.0-0.5	Long	Frequent	Brief	None
KeB:									
Kenefick	B								
		Jan-Dec	---	---	---	---	None	---	None
KfA:									
Kenefick	B								
		Jan-Dec	---	---	---	---	None	---	None
Caneyhead	D								
		January	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		February	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		March	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		April	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		May	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		June	0.0	0.3-1.0	0.0-0.5	Long	Frequent	---	None
		July	---	---	0.0-0.5	Long	Occasional	---	None
		August	---	---	0.0-0.5	Long	Occasional	---	None
		September	---	---	0.0-0.5	Long	Occasional	---	None
		October	---	---	0.0-0.5	Long	Occasional	---	None
		November	0.0	1.0-1.6	0.0-0.5	Long	Occasional	---	None
		December	0.0	1.0-1.6	0.0-0.5	Long	Frequent	---	None
KrB:									
Kirbyville	B								
		January	1.5-1.6	1.6-3.0	---	---	None	---	None
		February	1.5-1.6	1.6-3.0	---	---	None	---	None
		March	1.5-1.6	1.6-3.0	---	---	None	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
KwA:									
Kirbyville	B								
		January	1.5-1.6	1.6-3.0	---	---	None	---	None
		February	1.5-1.6	1.6-3.0	---	---	None	---	None
		March	1.5-1.6	1.6-3.0	---	---	None	---	None
Niwana	B								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	4.0-6.0	>6.0	---	---	None	---	None
KzB:									
Kountze	B								
		January	1.5-2.0	2.0-3.3	---	---	None	---	None
		February	1.5-2.0	2.0-3.3	---	---	None	---	None
		March	1.5-2.0	2.0-3.3	---	---	None	---	None
LdA:									
Labelle	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
Levac	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
LsA:									
Labelle	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
Spindletop	D								
		January	1.5-3.0	2.0-3.5	---	---	None	---	None
		February	1.5-3.0	2.0-3.5	---	---	None	---	None
		March	1.5-3.0	2.0-3.5	---	---	None	---	None
LtA:									
League	D								
		January	0.5-1.0	1.0-1.5	---	---	None	---	None
		February	0.5-1.0	1.0-1.5	---	---	None	---	None
		March	0.5-1.0	1.0-1.5	---	---	None	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
LvA:									
Lelavale	B/D								
		January	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		February	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		March	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Long	Occasional	---	None
		June	0.0	>6.0	0.0-1.0	Long	Occasional	---	None
		July	---	---	0.0-0.5	Long	Occasional	---	None
		August	---	---	0.0-0.5	Long	Occasional	---	None
		September	---	---	0.0-0.5	Long	Occasional	---	None
		October	---	---	0.0-1.0	Long	Frequent	---	None
		November	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		December	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
LwA:									
Leton	D								
		January	0.0-1.5	>6.0	0.0-1.0	Long	Frequent	---	None
		February	0.0-1.5	>6.0	0.0-1.0	Long	Frequent	---	None
		March	0.0-1.5	>6.0	0.0-1.0	Long	Frequent	---	None
		April	0.0-1.5	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0-1.5	>6.0	0.0-1.0	Long	Frequent	---	None
		June	---	---	0.0-0.5	Brief	Occasional	---	None
		July	---	---	0.0-0.5	Brief	Occasional	---	None
		August	---	---	0.0-0.5	Long	Occasional	---	None
		September	---	---	0.0-1.0	Long	Frequent	---	None
		October	0.0-1.5	>6.0	0.0-1.0	Long	Frequent	---	None
		November	0.0-1.5	>6.0	0.0-1.0	Long	Frequent	---	None
		December	0.0-1.5	>6.0	0.0-1.0	Long	Frequent	---	None
MaA:									
Manco	C								
		January	1.0-1.5	>6.0	---	---	None	Long	Frequent
		February	1.0-1.5	>6.0	---	---	None	Long	Frequent
		March	1.0-1.5	>6.0	---	---	None	Long	Frequent
		April	1.0-1.5	>6.0	---	---	None	Long	Frequent
		May	1.0-1.5	>6.0	---	---	None	Long	Frequent
		November	---	---	---	---	None	Long	Frequent
		December	1.0-1.5	>6.0	---	---	None	Long	Frequent

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
McC:									
McNeely	A								
		Jan-Dec	---	---	---	---	None	---	None
NdA:									
Nona	D								
		January	0.0	0.5-1.0	---	---	None	---	None
		February	0.0	0.5-1.0	---	---	None	---	None
		March	0.0	0.5-1.0	---	---	None	---	None
		April	0.0	0.5-1.0	---	---	None	---	None
		November	0.0	0.5-1.0	---	---	None	---	None
		December	0.0	>6.0	---	---	None	---	None
Dallardsville	C								
		January	3.0-4.0	3.0-4.0	---	---	None	---	None
		February	3.0-4.0	3.0-4.0	---	---	None	---	None
		March	3.0-4.0	3.0-4.0	---	---	None	---	None
		December	3.0-4.0	3.0-4.0	---	---	None	---	None
Oa:									
Oil-waste land	D								
		Jan-Dec	---	---	---	---	None	---	None
OeA:									
Olive	C								
		January	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		February	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		March	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		April	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		May	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		June	0.0	0.5-2.0	0.0-0.5	Long	Occasional	---	None
		July	0.0	0.5-2.0	0.0-0.5	Brief	Occasional	---	None
		August	0.0	0.5-2.0	0.0-0.5	Brief	Occasional	---	None
		September	0.0	0.5-2.0	0.0-0.5	Brief	Occasional	---	None
		October	0.0	0.5-2.0	0.0-0.5	Long	Occasional	---	None
		November	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		December	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
OvA:									
Olive	C								
		January	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		February	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		March	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		April	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		May	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		June	0.0	0.5-2.0	0.0-0.5	Long	Occasional	---	None
		July	0.0	0.5-2.0	0.0-0.5	Brief	Occasional	---	None
		August	0.0	0.5-2.0	0.0-0.5	Brief	Occasional	---	None
		September	0.0	0.5-2.0	0.0-0.5	Brief	Occasional	---	None
		October	0.0	0.5-2.0	0.0-0.5	Long	Occasional	---	None
		November	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
		December	0.0	0.5-2.0	0.5-1.5	Long	Frequent	---	None
Dallardsville	C								
		January	3.0-4.0	3.0-4.0	---	---	None	---	None
		February	3.0-4.0	3.0-4.0	---	---	None	---	None
		March	3.0-4.0	3.0-4.0	---	---	None	---	None
		December	3.0-4.0	3.0-4.0	---	---	None	---	None
OyB:									
Otanya	B								
		January	4.5-5.0	5.0-6.0	---	---	None	---	None
		February	4.5-5.0	5.0-6.0	---	---	None	---	None
		March	4.5-5.0	5.0-6.0	---	---	None	---	None
OyC:									
Otanya	B								
		January	4.5-5.0	5.0-6.0	---	---	None	---	None
		February	4.5-5.0	5.0-6.0	---	---	None	---	None
		March	4.5-5.0	5.0-6.0	---	---	None	---	None
PkA:									
Plank	D								
		January	0.0-0.5	0.5-3.5	---	---	None	---	None
		February	0.0-0.5	0.5-3.5	---	---	None	---	None
		March	0.0-0.5	0.5-3.5	---	---	None	---	None
		April	0.0-0.5	0.5-3.5	---	---	None	---	None
		May	0.0-0.5	0.5-3.5	---	---	None	---	None
		November	0.0-0.5	0.5-3.5	---	---	None	---	None
		December	0.0-1.0	1.0-2.5	---	---	None	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
SbC:									
Silsbee	B								
		Jan-Dec	---	---	---	---	None	---	None
SbD:									
Silsbee	B								
		Jan-Dec	---	---	---	---	None	---	None
SdA:									
Sorter	D								
		January	0.0	0.5-1.5	0.0-0.5	Long	Frequent	---	None
		February	0.0	0.5-1.5	0.0-0.5	Long	Frequent	---	None
		March	0.0	0.5-1.5	0.0-0.5	Long	Frequent	---	None
		April	0.0	0.5-1.5	0.0-0.5	Brief	Occasional	---	None
		May	0.0	0.5-1.5	0.0-0.5	Brief	Occasional	---	None
		June	---	---	0.0-0.5	Brief	Occasional	---	None
		July	---	---	0.0-0.5	Brief	Rare	---	None
		August	---	---	0.0-0.5	Brief	Rare	---	None
		September	---	---	0.0-0.5	Brief	Occasional	---	None
		October	---	---	0.0-0.5	Brief	Occasional	---	None
		November	0.0	0.5-1.5	0.0-0.5	Brief	Occasional	---	None
		December	0.0	0.5-1.5	0.0-0.5	Long	Frequent	---	None
Dallardsville	C								
		January	3.0-4.0	3.0-4.0	---	---	None	---	None
		February	3.0-4.0	3.0-4.0	---	---	None	---	None
		March	3.0-4.0	3.0-4.0	---	---	None	---	None
		December	3.0-4.0	3.0-4.0	---	---	None	---	None
SpB:									
Spurger	C								
		January	5.0-6.0	>6.0	---	---	None	---	None
		February	5.0-6.0	>6.0	---	---	None	---	None
		December	5.0-6.0	>6.0	---	---	None	---	None
TuB:									
Turkey	A								
		Jan-Dec	---	---	---	---	None	---	None

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
TyA:									
Tyden	D								
		January	0.0-1.0	1.0-5.0	0.0-1.5	Long	Frequent	---	None
		February	0.0-1.0	1.0-5.0	0.0-1.5	Long	Frequent	---	None
		March	0.0-1.0	1.0-5.0	0.0-1.5	Long	Frequent	---	None
		April	0.0-1.0	1.0-5.0	0.0-1.5	Long	Frequent	---	None
		May	0.0-1.0	1.0-5.0	0.0-1.5	Long	Occasional	---	None
		June	0.0-1.0	1.0-5.0	0.0-0.5	Long	Occasional	---	None
		July	0.0-1.0	1.0-5.0	0.0-0.5	Brief	Occasional	---	None
		August	0.0-1.0	1.0-5.0	0.0-0.5	Brief	Occasional	---	None
		September	0.0-1.0	1.0-5.0	0.0-0.5	Brief	Occasional	---	None
		October	0.0-1.0	1.0-5.0	0.0-0.5	Long	Occasional	---	None
		November	0.0-1.0	1.0-5.0	0.0-1.5	Long	Occasional	---	None
		December	0.0-1.0	1.0-5.0	0.0-1.5	Long	Frequent	---	None
Babco	C								
		January	2.0-3.0	2.5-3.0	---	---	None	---	None
		February	2.0-3.0	2.5-3.0	---	---	None	---	None
		March	2.0-3.0	2.5-3.0	---	---	None	---	None
		April	2.0-3.0	2.5-3.0	---	---	None	---	None
		December	2.0-3.0	2.5-3.0	---	---	None	---	None
VaA:									
Vamont	D								
		January	0.0-1.0	0.5-1.5	---	---	None	---	None
		February	0.0-1.0	0.5-1.5	---	---	None	---	None
		March	0.0-1.0	0.5-1.5	---	---	None	---	None
		November	0.0-1.0	0.5-1.5	---	---	None	---	None
		December	0.0-1.0	0.5-1.5	---	---	None	---	None
VoA:									
Votaw	B								
		January	2.0-2.5	2.5-3.0	---	---	None	Brief	Rare
		February	2.0-2.5	2.5-3.0	---	---	None	Brief	Rare
		March	2.0-2.5	2.5-3.0	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	---	---	---	---	None	Brief	Rare
		December	2.0-2.5	2.5-3.0	---	---	None	Brief	Rare

Table 17.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
W:									
Water	---								
		Jan-Dec	---	---	---	---	None	---	None
WdA:									
Waller	B/D								
		January	0.0-2.0	2.0-3.5	---	---	None	---	None
		February	0.0-2.0	2.0-3.5	---	---	None	---	None
		March	0.0-2.0	2.0-3.5	---	---	None	---	None
		November	0.0-2.0	2.0-3.5	---	---	None	---	None
		December	0.0-2.0	2.0-3.5	---	---	None	---	None
Dallardsville	C								
		January	3.0-4.0	3.0-4.0	---	---	None	---	None
		February	3.0-4.0	3.0-4.0	---	---	None	---	None
		March	3.0-4.0	3.0-4.0	---	---	None	---	None
		December	3.0-4.0	3.0-4.0	---	---	None	---	None

Table 18.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
AnA:						
Anahuac	---	---	---	---	High	Moderate
Aris	---	---	---	---	High	Moderate
ArA:						
Aris	---	---	---	---	High	Moderate
Levac	---	---	---	---	High	Moderate
AsA:						
Aris	---	---	---	---	High	Moderate
Spindletop	---	---	---	---	High	High
BaA:						
Batson	---	---	---	---	Moderate	Moderate
BeA:						
Beaumont	---	---	---	---	High	High
BoB:						
Belrose	---	---	---	---	Moderate	High
BrA:						
Belrose	---	---	---	---	Moderate	High
Caneyhead	---	---	---	---	High	High
BvA:						
Bevil	---	---	---	---	High	High
CaA:						
Camptown	---	---	---	---	High	High
CbA:						
Camptown	---	---	---	---	High	High
Batson	---	---	---	---	Moderate	Moderate
CyA:						
Cypress	---	---	---	---	Moderate	High
DAM:						
Dam	---	---	---	---	---	---
EsA:						
Estes	---	---	---	---	High	High
EtA:						
Estes	---	---	---	---	High	High
Angelina	---	---	---	---	High	High
EvA:						
Evadale	---	---	---	---	High	High
EwA:						
Evadale	---	---	---	---	High	High
Gist	---	---	---	---	High	High

Table 18.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
ExA:						
Evadale	---	---	---	---	High	High
Texla	---	---	---	---	High	High
IbA:						
Iulus	---	---	---	---	Moderate	High
Bleakwood	---	---	---	---	High	High
JaA:						
Jasco	Fragipan	15-80	---	Noncemented	High	High
JhA:						
Jayhawker	Fragipan	69-80	---	Noncemented	High	High
KeB:						
Kenefick	---	---	---	---	Moderate	High
KfA:						
Kenefick	---	---	---	---	Moderate	High
Caneyhead	---	---	---	---	High	High
KrB:						
Kirbyville	---	---	---	---	High	Moderate
KwA:						
Kirbyville	---	---	---	---	High	Moderate
Niwana	---	---	---	---	Moderate	High
KzB:						
Kountze	---	---	---	---	Moderate	High
LdA:						
Labelle	---	---	---	---	High	Moderate
Levac	---	---	---	---	High	Moderate
LsA:						
Labelle	---	---	---	---	High	Moderate
Spindletop	---	---	---	---	High	High
LtA:						
League	---	---	---	---	High	High
LvA:						
Lelavale	---	---	---	---	High	Moderate
LwA:						
Leton	---	---	---	---	High	Moderate
MaA:						
Manco	---	---	---	---	High	High
McC:						
McNeely	---	---	---	---	Low	High
NdA:						
Nona	---	---	---	---	High	High
Dallardsville	---	---	---	---	High	High

Table 18.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
Oa:						
Oil-waste land	---	---	---	---	High	Moderate
OeA:						
Olive	Fragipan	22-80	---	Noncemented	High	High
OvA:						
Olive	Fragipan	22-80	---	Noncemented	High	High
Dallardsville	---	---	---	---	High	High
OyB:						
Otanya	---	---	---	---	High	High
OyC:						
Otanya	---	---	---	---	High	High
PkA:						
Plank	---	---	---	---	High	High
SbC:						
Silsbee	---	---	---	---	Moderate	High
SbD:						
Silsbee	---	---	---	---	Moderate	High
SdA:						
Sorter	---	---	---	---	High	High
Dallardsville	---	---	---	---	High	High
SpB:						
Spurger	---	---	---	---	High	High
TuB:						
Turkey	---	---	---	---	Low	High
TyA:						
Tyden	---	---	---	---	High	High
Babco	---	---	---	---	High	High
VaA:						
Vamont	---	---	---	---	High	High
VoA:						
Votaw	---	---	---	---	High	Moderate
W:						
Water	---	---	---	---	---	---
WdA:						
Waller	---	---	---	---	High	Moderate
Dallardsville	---	---	---	---	High	High

Table 19.--Physical Analyses of Selected Soils

(The abbreviation "COLE" means coefficient of linear extensibility. Dashes indicate that data were not available.)

Soil name and sample number	Depth	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)	Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.0002 mm	Total Clay	Percent Passing Sieve Number: #4	#10	#40	#200	COLE	Bulk Density: 1/3-bar	Oven Dry	Water Content 1/3-bar
	In								(by weight)			Pct	Pct	Pct	Pct	cm/cm	g/cc	g/cc	Wt %
Babco (2,3)																			
S94TX-199-004																			
95P1006S	0-8	TR	1.0	11.0	49.0	17.0	76.0	8.0	22.3	---	1.7	100	100	96	31	0.007	1.33	1.33	11.1
95P1007S	8-12	---	TR	9.0	49.0	17.0	73.6	9.0	24.1	---	2.3	100	100	97	34	---	1.61	1.61	6.2
95P1008S	12-16	---	TR	8.0	46.0	19.0	71.2	10.0	25.9	---	2.9	100	100	98	37	---	1.64	1.64	8.1
95P1009S	16-22	---	1.0	8.0	46.0	18.0	70.8	10.0	24.1	---	2.5	100	100	98	37	0.004	1.66	1.68	7.7
95P1010S	22-43	---	TR	7.0	45.0	18.0	68.1	12.0	26.7	---	2.7	100	100	98	40	---	1.79	1.79	8.7
95P1011S	43-55	---	TR	8.0	47.0	17.0	69.8	11.0	29.2	---	3.7	100	100	98	38	---	1.88	1.88	9.6
95P1012S	55-66	---	TR	9.0	50.0	16.0	69.3	9.0	26.5	---	7.3	100	100	98	37	0.004	1.83	1.85	11.9
95P1013S	66-80	---	TR	8.0	49.0	17.0	69.7	10.0	23.4	---	6.8	100	100	98	38	0.004	1.86	1.88	9.8
95P1014S	80-91	---	TR	7.0	48.0	17.0	68.4	11.0	25.3	---	6.3	100	100	98	39	---	1.95	1.95	7.8
Batson (1,3)																			
S96TX-199-007																			
6042	0-6	0.4	0.9	0.9	20.9	44.8	67.9	11.8	29.4	0.2	2.7	---	---	---	---	0.026	1.24	1.34	34.3
6043	6-13	0.1	0.2	0.6	19.8	45.4	66.1	12.8	30.4	0.6	3.5	---	---	---	---	0.011	1.46	1.51	24.5
6044	13-29	0.1	0.3	0.5	18.3	44.9	64.1	12.8	30.4	2.0	5.5	---	---	---	---	0.016	1.40	1.47	21.6
6045	29-35	0.1	0.5	0.8	16.8	40.9	59.1	12.3	30.4	5.7	10.5	---	---	---	---	0.021	1.38	1.47	21.6
6046	35-55	0.1	0.1	0.5	14.0	37.3	52.0	9.8	24.9	17.4	23.1	---	---	---	---	0.029	1.54	1.68	20.9
6047	55-78	0.0	0.0	0.3	13.7	43.9	57.9	8.6	24.3	12.4	17.8	---	---	---	---	0.021	1.53	1.63	20.0
6048	78-90	0.0	0.1	0.3	13.5	47.7	61.6	8.5	19.7	13.4	18.7	---	---	---	---	0.032	1.50	1.65	23.2
Belrose (1,3)																			
S95TX-199-006																			
4989	0-5	0.0	0.3	0.9	32.9	49.5	83.6	5.9	15.8	0.5	0.6	---	---	---	---	---	---	---	---
4990	5-13	0.0	0.1	0.6	30.2	51.5	82.4	7.1	17.1	0.2	0.5	---	---	---	---	---	---	---	---
4991	13-20	0.1	0.0	0.4	30.2	51.9	82.5	7.0	15.7	0.4	1.8	---	---	---	---	0.0	1.48	1.48	24.5
4992	20-31	0.0	0.0	0.3	30.7	50.4	81.5	6.2	14.4	0.7	4.1	---	---	---	---	0.002	1.44	1.45	25.6
4993	31-44	0.0	0.0	0.3	30.3	51.6	82.2	5.9	14.5	0.5	3.3	---	---	---	---	0.017	1.33	1.40	25.1
4994	44-63	0.0	0.0	0.3	28.8	52.1	81.2	6.9	14.1	0.5	4.7	---	---	---	---	0.007	1.39	1.42	25.0
4995	63-75	0.0	0.0	0.1	23.7	46.3	70.1	3.6	10.5	10.9	19.4	---	---	---	---	0.013	1.49	1.55	24.0
4996	75-80	0.0	0.0	0.2	37.0	43.8	81.0	2.6	9.6	4.2	9.4	---	---	---	---	0.012	1.40	1.45	25.1
Camptown (1,3)																			
S96TX-199-006																			
6035	0-4	0.4	0.6	0.5	16.4	18.5	36.4	35.9	55.6	2.4	8.0	---	---	---	---	0.046	1.10	1.26	46.5
6036	4-13	0.2	0.2	0.7	19.2	20.1	40.4	36.0	53.9	1.5	5.7	---	---	---	---	0.130	1.76	1.83	17.5
6037	13-24	0.1	0.1	0.3	18.3	17.5	36.3	39.3	57.4	2.6	6.3	---	---	---	---	0.019	1.70	1.80	18.4
6038	24-35	0.2	0.2	0.4	14.5	17.2	32.5	36.9	54.5	5.9	13.0	---	---	---	---	0.017	1.74	1.83	18.0
6039	35-46	0.2	0.3	0.5	12.3	14.1	27.4	35.2	51.1	11.0	21.5	---	---	---	---	0.026	1.79	1.94	16.1
6040	46-69	0.2	0.2	0.5	12.4	13.6	26.9	33.7	48.5	13.0	24.6	---	---	---	---	0.038	1.77	1.98	17.1
6041	69-80	0.1	0.4	0.6	14.5	15.8	31.4	26.3	40.7	15.6	27.9	---	---	---	---	0.056	1.64	1.93	21.6

See footnotes at end of table

Table 19.--Physical Analyses of Selected Soils--Continued

(The abbreviation "COLE" means coefficient of linear extensibility. Dashes indicate that data were not available.)

Soil name and sample number	Depth	Particle-size distribution										Percent Passing Sieve Number				COLE	Bulk Density		Water Content 1/3-bar
		Sand						Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.0002 mm	Total Clay	#4	#10	#40	#200		1/3-bar	Oven Dry	
		Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)												
	In	(by weight)										Pct	Pct	Pct	Pct	cm/cm	g/cc	g/cc	Wt %
Caneyhead (1,4)																			
S95TX-199-007																			
4997	0-4	0.1	0.4	1.1	4.5	19.9	26.0	44.1	61.7	3.2	12.3	---	---	---	---	0.021	1.23	1.31	35.7
4998	4-18	0.1	0.2	0.6	4.6	28.5	34.0	31.8	50.3	5.6	15.7	---	---	---	---	0.013	1.55	1.61	21.6
4999	18-29	0.2	0.4	0.6	3.9	22.9	28.0	31.2	46.6	12.1	25.4	---	---	---	---	0.015	1.54	1.61	24.1
5000	29-46	0.1	0.2	0.5	3.2	22.5	26.5	25.0	40.0	17.6	33.5	---	---	---	---	0.040	1.53	1.72	26.2
5001	46-63	0.1	0.2	0.3	6.8	33.1	40.5	15.3	32.3	13.5	27.2	---	---	---	---	0.033	1.56	1.72	23.4
5002	63-80	0.0	0.1	0.3	17.5	43.9	61.8	8.7	21.1	9.5	17.1	---	---	---	---	0.037	1.47	1.64	27.3
Dallardsville (1,4)																			
S95TX-199-002																			
4939	0-11	0.7	0.4	0.6	26.5	41.3	69.5	11.9	27.4	2.2	3.1	---	---	---	---	0.021	1.39	1.48	27.2
4940	11-20	0.4	0.3	0.5	25.9	10.9	68.0	12.1	28.8	2.5	3.2	---	---	---	---	0.037	1.38	1.54	19.2
4941	20-31	0.3	0.1	0.3	24.5	39.5	64.7	13.4	29.8	4.0	5.5	---	---	---	---	0.017	1.53	1.61	19.0
4942	31-38	0.1	0.1	0.3	24.6	39.3	64.4	13.0	29.1	4.6	6.5	---	---	---	---	0.006	1.58	1.61	17.7
4943	38-47	0.4	0.4	0.5	22.3	35.1	58.7	13.2	28.0	9.9	13.3	---	---	---	---	0.004	1.53	1.55	18.5
4944	47-61	0.3	0.2	0.4	21.3	35.0	57.2	11.2	28.7	11.2	14.1	---	---	---	---	0.008	1.57	1.61	16.7
4945	61-76	0.1	0.1	0.3	22.4	34.1	57.0	12.7	28.6	12.2	14.4	---	---	---	---	0.016	1.65	1.73	19.6
4946	76-80	0.1	0.2	0.4	21.2	33.1	55.1	14.3	29.4	12.6	15.5	---	---	---	---	0.018	1.65	1.74	17.8
Evadale (1,4)																			
S96TX-199-005																			
6029	0-5	0.1	0.9	0.9	4.1	13.0	19.0	47.7	68.2	5.9	12.8	---	---	---	---	0.042	1.21	1.37	38.0
6030	5-16	0.1	0.3	0.8	5.0	16.5	22.7	40.6	64.8	6.3	12.5	---	---	---	---	0.033	1.29	1.42	33.8
6031	16-25	0.0	0.1	0.4	2.7	8.9	12.1	43.4	64.7	13.3	23.2	---	---	---	---	0.041	1.37	1.56	30.0
6032	25-41	0.0	0.0	0.1	2.2	6.8	9.1	36.6	54.4	25.0	36.5	---	---	---	---	0.080	1.39	1.75	29.6
6033	41-59	0.0	0.0	0.1	2.3	6.5	8.9	35.6	52.5	25.8	38.6	---	---	---	---	0.095	1.43	1.88	28.3
6034	59-80	0.2	0.2	0.2	2.2	7.0	9.8	25.1	46.6	28.7	43.6	---	---	---	---	0.122	1.40	1.98	32.2
Jayhawker (1,4)																			
S95TX-199-009																			
5010	0-6	0.1	0.1	0.5	7.0	29.7	37.4	33.0	57.8	1.4	4.8	---	---	---	---	0.011	1.50	1.55	25.8
5011	6-20	0.0	0.2	0.5	8.5	31.3	40.5	27.1	54.1	2.0	5.4	---	---	---	---	0.013	1.54	1.60	21.1
5012	20-36	0.1	0.2	0.7	8.1	30.7	39.8	27.8	55.6	3.1	4.6	---	---	---	---	0.004	1.59	1.61	19.7
5013	36-69	0.2	0.1	0.6	7.7	27.5	36.1	27.0	55.6	5.9	8.3	---	---	---	---	0.014	1.62	1.69	20.8
5014	69-80	0.1	0.1	0.3	8.1	30.6	39.2	26.4	54.2	3.5	6.6	---	---	---	---	0.006	1.80	1.83	15.4
Kirbyville (1,4)																			
S96TX-199-001																			
6000	0-5	0.8	1.2	1.3	19.9	26.8	50.0	25.1	44.7	3.4	5.3	---	---	---	---	0.006	1.60	1.63	19.5
6001	5-11	0.3	0.4	0.9	18.2	27.2	47.0	25.6	44.0	6.0	9.0	---	---	---	---	0.010	1.60	1.65	18.6
6002	11-18	0.6	0.2	0.7	16.9	25.7	44.1	21.2	40.3	11.5	15.6	---	---	---	---	0.008	1.57	1.61	19.2
6003	18-25	0.7	0.5	1.0	17.9	22.2	42.3	19.2	35.7	17.4	22.0	---	---	---	---	0.025	1.44	1.55	22.3
6004	25-33	0.6	0.4	0.7	16.2	24.2	42.4	19.4	36.6	15.6	21.0	---	---	---	---	0.011	1.49	1.54	22.4
6005	33-60	0.1	0.1	0.5	18.1	24.5	43.3	19.7	35.8	16.3	20.9	---	---	---	---	0.0	1.52	1.52	19.6
6006	60-80	0.2	0.2	0.5	16.4	20.7	38.0	16.5	29.8	24.1	32.2	---	---	---	---	0.010	1.52	1.57	23.1

See footnotes at end of table

Table 19.--Physical Analyses of Selected Soils--Continued

(The abbreviation "COLE" means coefficient of linear extensibility. Dashes indicate that data were not available.)

Soil name and sample number	Depth	Particle-size distribution										Percent Passing Sieve Number				COLE	Bulk Density		Water Content 1/3-bar
		Sand						Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.0002 mm	Total Clay	#4	#10	#40	#200		1/3-bar	Oven Dry	
		Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)												
	In	(by weight)										Pct	Pct	Pct	Pct	cm/cm	g/cc	g/cc	Wt %
Kountze (1,4)																			
S96TX-199-002																			
6007	0-6	1.0	1.4	4.0	17.5	26.8	50.7	21.4	46.1	2.5	3.2	---	---	---	---	0.016	1.42	1.49	28.7
6008	6-17	0.2	0.4	3.6	18.1	27.0	49.3	20.9	46.6	4.5	4.1	---	---	---	---	0.009	1.51	1.55	22.7
6009	17-25	0.1	0.3	3.5	17.2	26.0	47.1	21.3	46.3	4.9	6.6	---	---	---	---	0.009	1.43	1.47	21.6
6010	25-43	0.3	0.4	3.3	15.5	24.1	43.6	21.3	47.1	7.1	9.3	---	---	---	---	0.012	1.43	1.48	21.6
6011	43-54	0.3	0.5	3.0	14.8	23.7	42.3	20.3	44.5	10.7	13.2	---	---	---	---	0.015	1.50	1.57	20.8
6012	54-73	0.1	0.2	2.8	15.4	23.6	42.1	22.6	46.4	9.7	11.5	---	---	---	---	0.028	1.51	1.64	19.2
6013	73-80	0.0	0.1	2.3	13.9	22.0	38.3	28.5	51.3	8.6	10.4	---	---	---	---	0.022	1.50	1.60	20.9
McNeely (2,4)																			
S94TX-199-001																			
95P985S	0-5	0.1	2.3	49.5	36.4	5.4	93.7	0.9	3.7	---	2.6	100	100	85	9	0.005	1.39	1.41	6.1
95P986S	5-22	0.1	2.3	48.7	37.3	6.1	94.5	0.8	3.5	---	2.0	100	100	85	9	---	---	---	---
95P987S	22-37	---	1.6	47.9	39.0	6.2	94.7	0.6	3.5	---	1.8	100	100	86	9	---	---	---	---
95P988S	37-45	---	2.2	51.3	36.8	5.1	95.4	0.6	2.6	---	2.0	100	100	85	7	---	---	---	---
95P989S	45-72	---	2.6	52.5	36.4	4.4	95.9	---	1.8	---	2.3	100	100	84	7	---	---	---	---
95P990S	72-80	---	2.0	52.3	37.5	3.4	95.2	0.3	1.7	---	3.1	100	100	85	7	0.004	1.56	1.58	3.3
Nona (1,4)																			
S96TX-199-008																			
6049	0-3	1.1	1.1	0.9	18.3	37.2	58.6	13.2	38.6	1.7	2.8	---	---	---	---	0.020	1.28	1.37	27.3
6050	3-7	0.3	0.4	1.1	20.1	38.4	60.3	11.6	36.6	2.1	3.1	---	---	---	---	0.014	1.38	1.44	22.6
6051	7-19	0.2	0.6	1.0	24.2	39.1	65.1	11.1	31.3	2.7	3.6	---	---	---	---	0.027	1.46	1.58	21.9
6052	19-38	0.9	0.7	0.5	11.7	27.2	41.0	16.3	38.4	14.8	20.6	---	---	---	---	0.043	1.50	1.70	25.0
6053	38-53	0.3	0.3	0.4	9.5	20.8	31.3	16.8	34.0	26.2	34.7	---	---	---	---	0.062	1.47	1.76	27.3
6054	53-72	0.0	0.1	0.4	12.6	27.2	40.3	16.2	34.5	16.0	25.2	---	---	---	---	0.040	1.60	1.80	18.3
6055	72-80	0.1	0.0	0.2	10.1	24.0	34.4	15.6	29.2	21.9	36.4	---	---	---	---	0.100	1.45	1.93	29.2
Plank (2,4)																			
S94TX-199-005																			
95P1015S	0-3	0.1	0.1	0.5	7.2	16.2	24.1	46.5	71.0	3.3	4.9	100	100	100	86	0.004	1.50	1.52	15.4
95P1016S	3-24	---	TR	0.3	9.6	21.3	31.2	40.7	65.2	2.8	3.6	100	100	100	82	0.004	1.62	1.64	15.8
95P1017S	24-35	---	TR	0.3	9.0	22.9	32.2	35.2	61.7	4.3	6.1	100	100	100	82	0.002	1.65	1.66	15.3
95P1018S	35-65	---	0.1	0.3	10.0	24.1	34.5	29.4	56.8	6.5	8.7	100	100	100	81	0.008	1.68	1.72	14.4
95P1019S	65-80	---	TR	0.3	10.9	27.1	38.3	26.0	55.6	4.8	6.1	100	100	100	79	0.016	1.67	1.75	15.9
D0491*	96-108	0.0	0.1	0.1	15.1	28.4	43.7	18.7	30.9	12.6	25.4	---	---	---	---	---	---	---	---
D0492*	144-180	0.0	0.0	0.2	1.0	3.7	4.9	27.1	36.9	32.4	58.2	---	---	---	---	---	---	---	---

See footnotes at end of table

Table 19.--Physical Analyses of Selected Soils--Continued

(The abbreviation "COLE" means coefficient of linear extensibility. Dashes indicate that data were not available.)

Soil name and sample number	Depth	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)	Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.0002 mm	Total Clay	Percent Passing Sieve Number: #4	#10	#40	#200	COLE	Bulk Density: 1/3-bar	Oven Dry	Water Content 1/3-bar
	In							(by weight)				Pct	Pct	Pct	Pct	cm/cm	g/cc	g/cc	Wt %
Silsbee (1,4)																			
4982	0-5	0.5	0.7	8.4	39.5	28.4	77.5	9.6	21.5	0.9	1.0	---	---	---	---	---	---	---	---
4983	5-15	0.1	0.3	7.7	38.0	28.9	75.0	12.1	23.0	1.0	2.0	---	---	---	---	0.012	1.60	1.66	18.7
4984	15-30	0.1	0.2	4.7	26.3	21.5	52.8	11.8	21.1	21.8	26.1	---	---	---	---	0.018	1.62	1.71	20.0
4985	30-49	0.0	0.1	4.4	27.1	22.4	54.0	9.6	18.4	21.8	27.6	---	---	---	---	0.012	1.67	1.73	19.5
4986	49-58	0.0	0.1	3.8	30.2	23.5	57.6	7.8	15.6	21.7	26.8	---	---	---	---	0.008	1.66	1.70	18.4
4987	58-71	0.0	0.1	4.3	35.9	21.6	61.9	6.2	14.0	19.0	24.1	---	---	---	---	0.008	1.69	1.73	17.4
4988	71-80	0.0	0.1	4.2	43.5	18.8	66.6	5.3	10.9	17.9	22.5	---	---	---	---	0.008	1.67	1.71	18.0
Sorter (1,4)																			
95TX-199-008																			
5003	0-3	0.0	0.2	1.4	14.4	34.0	50.0	26.0	47.8	1.5	2.2	---	---	---	---	0.035	1.11	1.23	36.9
5004	3-24	0.0	0.2	0.4	11.5	34.4	46.5	22.3	49.9	1.8	3.6	---	---	---	---	0.009	1.52	1.56	19.9
5005	24-41	0.0	0.1	0.6	14.0	35.9	50.6	20.6	45.0	2.3	4.4	---	---	---	---	0.013	1.58	1.64	21.5
5006	41-51	0.0	0.1	0.8	14.3	38.0	53.2	17.9	42.7	2.1	4.1	---	---	---	---	0.008	1.64	1.68	19.7
5007	51-78	0.0	0.1	0.5	14.0	39.0	53.6	16.8	41.3	2.5	5.1	---	---	---	---	0.012	1.62	1.68	20.8
5008	78-80	0.0	0.1	0.6	13.0	35.9	49.6	20.5	45.8	2.2	4.6	---	---	---	---	0.031	1.58	1.73	17.9
5009	144-156	0.0	0.0	0.2	5.8	18.9	24.9	18.9	31.3	29.4	43.8	---	---	---	---	---	---	---	---
Spurger (1,4)																			
S96TX-199-003																			
6014	0-6	1.3	1.7	2.8	19.4	30.3	55.5	20.1	37.8	2.4	6.7	---	---	---	---	0.018	1.42	1.50	28.2
6015	6-11	0.7	0.8	2.5	18.7	33.6	56.3	19.7	34.6	3.7	9.1	---	---	---	---	0.006	1.59	1.62	16.6
6016	11-25	0.5	1.0	1.5	4.2	9.3	16.5	18.8	26.7	35.8	56.8	---	---	---	---	0.108	1.22	1.66	39.3
6017	25-37	0.2	0.6	0.9	2.9	8.7	13.3	18.8	25.5	40.6	61.2	---	---	---	---	0.118	1.21	1.69	40.0
6018	37-50	0.1	0.6	1.2	5.1	8.7	15.7	18.9	27.6	35.9	56.7	---	---	---	---	0.121	1.25	1.76	37.7
6019	50-58	0.1	0.5	2.5	17.4	9.8	30.3	17.0	23.3	27.7	46.4	---	---	---	---	0.099	1.32	1.75	32.3
6020	58-74	0.1	0.1	7.2	34.2	9.8	51.4	10.1	18.2	18.8	30.4	---	---	---	---	0.063	1.48	1.78	26.1
6021	74-80	0.0	0.1	14.2	61.3	6.7	82.3	2.8	6.0	7.1	11.7	---	---	---	---	0.014	1.64	1.71	15.3
Texla (1,3)																			
S94TX-199-005																			
6022	0-5	1.3	1.4	1.6	9.4	30.2	43.9	22.0	52.5	1.1	3.6	---	---	---	---	0.046	1.04	1.19	40.3
6023	5-11	0.5	0.8	1.3	8.4	30.6	41.6	22.9	54.8	1.6	3.6	---	---	---	---	---	---	---	---
6024	11-17	0.4	0.9	0.7	7.1	24.4	33.5	23.9	55.3	7.0	11.2	---	---	---	---	0.005	1.43	1.45	19.5
6025	17-38	0.3	0.5	0.5	5.4	19.2	25.9	29.7	55.8	11.9	18.3	---	---	---	---	0.013	1.48	1.54	21.1
6026	38-45	0.1	0.2	0.4	5.0	16.4	22.1	26.3	48.4	23.3	29.5	---	---	---	---	0.075	1.37	1.70	30.8
6027	45-67	0.0	0.1	0.2	3.6	13.7	17.6	23.7	42.8	32.1	39.6	---	---	---	---	0.088	1.43	1.84	28.7
6028	67-80	0.0	0.0	0.2	4.1	14.1	18.4	24.7	46.2	25.8	35.4	---	---	---	---	0.075	1.58	1.94	24.6

See footnotes at end of table

Table 19.--Physical Analyses of Selected Soils--Continued

(The abbreviation "COLE" means coefficient of linear extensibility. Dashes indicate that data were not available.)

Soil name and sample number	Depth	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)	Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.0002 mm	Total Clay	Percent Passing Sieve Number: #4	#10	#40	#200	COLE	Bulk Density: 1/3-bar	Oven Dry	Water Content 1/3-bar
	In								(by weight)			Pct	Pct	Pct	Pct	cm/cm	g/cc	g/cc	Wt %
Turkey (2,3)																			
S94TX-199-002																			
95P991S	0-5	TR	2.3	48.9	35.5	2.3	89.0	3.4	0.2	---	3.8	100	100	85	12	0.006	1.55	1.58	6.1
95P992S	5-10	---	2.1	46.5	39.1	2.0	89.7	3.5	6.1	---	4.2	100	100	86	11	0.004	1.64	1.66	3.8
95P993S	10-20	TR	2.4	47.7	37.0	2.2	89.3	3.5	6.2	---	4.5	100	100	86	12	0.014	1.69	1.76	8.9
95P994S	20-33	TR	2.6	50.1	34.8	1.8	89.3	3.7	6.6	---	4.1	100	100	85	12	---	---	---	---
95P995S	33-52	---	1.7	49.6	36.8	1.9	90.0	3.1	5.6	---	4.4	100	100	86	11	0.012	1.71	1.77	10.2
95P996S	52-80	TR	2.7	50.0	34.0	1.9	88.6	3.5	6.1	---	5.3	100	100	85	12	---	---	---	---
Tyden (2,3)																			
S94TX-199-003																			
95P997S	0-3	0.1	3.0	3.9	17.3	15.0	39.3	31.7	57.1	---	3.6	100	100	96	69	---	---	---	---
95P998S	3-13	TR	0.1	2.0	27.6	15.3	45.0	27.4	50.5	3.5	4.5	100	100	99	63	0.002	1.46	1.47	16.2
95P999S	13-19	---	0.1	4.3	35.3	14.1	53.8	23.1	42.7	3.5	3.5	100	100	99	54	0.016	1.63	1.71	10.9
95P1000S	19-28	TR	0.1	6.1	35.7	13.5	55.4	21.9	41.0	3.0	3.6	100	100	98	52	---	1.81	1.81	9.8
95P1001S	28-41	TR	0.2	5.5	34.7	13.3	53.7	22.6	41.5	4.1	4.8	100	100	98	54	0.004	1.78	1.80	10.9
95P1002S	41-58	---	0.1	5.1	34.6	13.8	53.6	22.6	40.9	4.4	5.5	100	100	99	54	0.007	1.77	1.81	12.1
95P1003S	58-73	TR	0.1	4.9	34.9	13.6	53.5	21.4	39.9	4.9	6.6	100	100	99	54	0.007	1.81	1.85	10.2
95P1004S	73-82	---	0.1	4.4	31.8	12.9	49.2	24.0	41.6	6.2	9.2	100	100	99	58	0.020	1.67	1.77	16.4
95P1005S	82-89	---	0.1	2.3	16.0	18.3	36.7	23.4	49.4	8.0	13.9	100	100	99	74	0.013	1.73	1.80	15.6
Vamont (1,4)																			
S98TX-199-001																			
6277	0-4	0.1	0.3	0.5	1.6	5.4	7.9	35.2	42.0	32.5	50.1	---	---	---	---	0.104	1.27	1.71	34.4
6278	4-7	0.0	0.1	0.2	1.0	5.0	6.3	30.9	37.0	41.8	56.7	---	---	---	---	0.121	1.30	1.83	30.8
6279	7-20	0.1	0.1	0.1	0.9	4.6	5.8	31.2	37.7	39.5	56.5	---	---	---	---	0.122	1.33	1.88	30.9
6280	20-34	0.0	0.0	0.1	0.7	4.3	5.1	33.2	40.6	40.1	54.3	---	---	---	---	0.119	1.37	1.92	29.5
6281	34-47	0.0	0.1	0.1	0.7	4.2	5.1	29.3	37.4	40.8	57.5	---	---	---	---	0.128	1.35	1.94	30.8
6282	47-60	0.1	0.1	0.1	0.7	4.0	5.0	27.7	35.9	42.0	59.1	---	---	---	---	0.150	1.31	1.99	34.9
6283	60-76	0.0	0.1	0.1	0.6	3.1	3.9	22.7	31.2	42.8	64.9	---	---	---	---	0.158	1.27	1.97	37.6
6284	76-80	0.1	0.0	0.1	0.4	1.4	2.0	18.3	22.3	27.6	75.7	---	---	---	---	0.180	1.17	1.92	42.9
Votaw (1,4)																			
S95TX-199-004																			
4974	0-4	0.8	0.9	10.8	65.4	15.5	93.4	3.3	5.6	0.4	1.0	---	---	---	---	0.017	1.13	1.19	27.7
4975	4-9	0.2	0.3	10.4	67.9	14.8	93.6	2.4	4.8	0.3	1.6	---	---	---	---	0.002	1.43	1.44	24.3
4976	9-15	0.0	0.2	11.2	66.5	14.1	92.0	2.8	7.1	0.3	0.9	---	---	---	---	0.002	1.53	1.54	21.7
4977	15-25	0.0	0.2	11.2	68.8	13.5	93.7	2.2	5.5	0.3	0.8	---	---	---	---	0.004	1.53	1.55	20.7
4978	25-29	0.0	0.2	10.7	68.5	14.1	93.5	2.3	5.6	0.2	0.9	---	---	---	---	0.002	1.45	1.46	22.4
4879	29-47	0.0	0.2	10.9	68.7	14.1	93.9	2.2	5.4	0.3	0.7	---	---	---	---	0.004	1.53	1.55	20.9
4980	47-63	0.0	0.1	11.6	69.0	13.0	93.7	2.5	5.6	0.3	0.7	---	---	---	---	0.018	1.44	1.52	17.0
4981	63-80	0.0	0.1	16.4	67.6	11.6	95.7	1.5	4.0	0.3	0.3	---	---	---	---	---	---	---	---

1 Soil Characterization Laboratory, Texas A&M University, College Station, Texas.
2 National Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska.
3 Type Location for series.
4 Typifying pedon for Hardin County, Texas.

Table 20.--Chemical Analyses of Selected Soils

(Dashes indicate that analyses were not made)

Soil name and sample number	Depth	Organic carbon	pH 1:1 (soil: water)	Extractable bases Ca	Mg	K	Na	Al	Total Acid- ity	Cation Exchange capacity (effect- ive)	Base satura- tion (sum)	Exchange- able sodium (ESP)	Aluminum saturation	Ratio CEC to Clay
	In	Pct	pH	----- Meq/100gm							Pct	Pct	Pct	
Babco (2,3)														
S94TX-199-004														
95P1006S	0-8	2.03	3.8	0.1	0.3	TR	---	1.6	11.9	2.0	5	---	80	4.94
95P1007S	8-12	0.12	4.0	---	---	---	---	0.2	5.8	0.2	1	---	100	1.79
95P1008S	12-16	0.63	3.9	---	---	---	---	1.9	0.5	1.9	TR	---	100	0.30
95P1009S	16-22	0.32	4.5	---	---	---	---	0.9	3.0	0.9	1	---	100	0.60
95P1010S	22-43	0.13	4.6	0.1	---	TR	---	0.5	0.5	0.6	14	---	83	0.26
95P1011S	43-55	0.04	4.5	---	---	---	---	0.7	1.9	0.7	1	---	100	0.27
95P1012S	55-66	0.06	4.6	---	---	TR	---	2.0	2.7	2.0	1	---	100	0.38
95P1013S	66-80	0.03	4.7	---	---	TR	---	1.5	3.2	1.5	1	---	100	0.35
95P1014S	80-91	0.03	5.1	---	---	0.1	TR	0.8	2.3	0.9	6	---	89	0.25
Batson (1,3)														
S96TX-199-007														
6042	0-6	0.93	5.7	3.6	0.4	0.1	0.1	---	---	6.4	66	2	---	2.37
6043	6-13	0.20	5.9	1.1	0.1	0.0	0.1	---	---	3.2	41	3	---	0.91
6044	13-29	0.13	5.9	1.1	0.1	0.0	0.1	---	---	2.8	48	4	---	0.51
6045	29-35	0.15	5.6	2.1	0.1	0.1	0.1	---	---	3.2	75	3	---	0.30
6046	35-55	0.17	4.2	1.5	1.0	0.1	0.1	1.9	---	4.6	30	1	41	0.39
6047	55-78	0.09	4.0	0.7	1.8	0.1	0.1	1.5	---	4.2	40	1	36	0.38
6048	78-90	0.10	4.1	0.9	2.2	0.1	0.1	1.4	---	4.7	49	2	30	0.36
Belrose (1,3)														
S95TX-199-006														
4989	0-5	0.40	4.6	0.2	0.1	0.1	0.1	0.7	---	1.2	14	3	58	6.17
4990	5-13	0.41	4.9	0.3	0.1	0.0	0.0	0.8	---	1.2	10	0	67	7.80
4991	13-20	0.14	5.4	0.6	0.1	0.1	0.1	0.4	---	1.3	27	3	31	1.83
4992	20-31	0.13	5.3	0.4	0.1	0.1	0.1	0.3	---	1.0	24	3	30	0.71
4993	31-44	0.07	5.2	0.1	0.1	0.0	0.1	0.7	---	1.0	12	4	70	0.76
4994	44-63	0.07	5.3	0.2	0.2	0.1	0.1	0.6	---	1.2	23	4	50	0.55
4995	63-75	0.15	5.0	1.5	0.2	0.2	0.1	2.3	---	4.3	24	1	53	0.43
4996	75-80	0.05	4.9	0.9	0.9	0.1	0.0	1.1	---	3.0	42	0	37	0.48
Camptown (1,3)														
S96TX-199-006														
6035	0-4	1.19	4.7	2.3	0.6	0.1	0.3	0.4	---	3.7	50	5	11	0.83
6036	4-13	0.21	5.0	1.5	0.2	0.0	0.3	0.1	---	2.1	56	8	5	0.63
6037	13-24	0.12	5.9	2.3	0.4	0.0	0.5	---	---	4.1	78	12	---	0.65
6038	24-35	0.11	6.5	4.0	0.5	0.0	1.2	---	---	6.5	88	18	---	0.50
6039	35-46	0.11	7.2	7.1	1.1	0.1	2.7	---	---	11.1	99	24	---	0.52
6040	46-69	0.09	7.3	5.2	1.1	0.1	3.6	---	---	12.7	79	26	---	0.52
6041	69-80	0.05	7.5	8.6	1.4	0.2	4.3	---	---	15.5	94	25	---	0.56

See footnotes at end of table

Table 20.--Chemical Analyses of Selected Soils--Continued

(Dashes indicate that analyses were not made)

Soil name and sample number	Depth	Organic carbon	pH 1:1 (soil: water)	Extractable bases Ca	Mg	K	Na	Al	Total Acid-ity	Cation Exchange capacity (effect-ive)	Base satura-tion (sum)	Exchange-able sodium (ESP)	Aluminum saturation	Ratio CEC to Clay
	In	Pct	pH	Meq/100gm							Pct	Pct	Pct	
Caneyhead (1,4)														
S95TX-199-007														
4997	0-4	1.39	4.5	1.6	0.6	0.2	0.1	1.3	---	3.8	32	1	34	0.63
4998	4-18	0.21	4.7	1.0	0.7	0.1	0.0	1.8	---	3.6	29	0	50	0.39
4999	18-29	0.30	4.4	1.5	1.3	0.1	0.1	4.7	---	7.7	26	1	61	0.45
5000	29-46	0.30	4.4	2.8	2.0	0.2	0.5	6.7	---	12.2	32	3	55	0.51
5001	46-63	0.15	4.5	2.6	2.1	0.2	0.5	5.6	---	11.0	34	3	51	0.59
5002	63-80	0.11	4.8	1.8	1.3	0.1	0.4	3.3	---	6.9	40	4	48	0.53
Dallardsville (1,4)														
S95TX-199-002														
4939	0-11	0.52	4.2	0.1	0.3	0.0	0.0	0.7	---	1.1	11	0	64	1.13
4940	11-20	0.20	3.7	0.0	0.0	0.0	0.0	0.5	---	0.5	0	0	100	0.78
4941	20-31	0.07	4.3	0.1	0.1	0.0	0.0	0.6	---	0.8	7	0	75	0.53
4942	31-38	0.08	3.9	0.1	0.1	0.0	0.0	0.9	---	1.1	6	0	82	0.48
4943	38-47	0.11	3.9	0.1	0.3	0.0	0.1	2.2	---	2.7	11	2	81	0.34
4944	47-61	0.13	3.9	0.1	0.4	0.0	0.0	2.5	---	3.0	11	0	83	0.33
4945	61-76	0.07	4.1	0.0	0.6	0.0	0.1	2.2	---	2.9	15	2	76	0.32
4946	76-80	0.07	4.2	0.1	0.8	0.0	0.1	2.1	---	3.1	20	2	68	0.32
Evadale (1,4)														
S96TX-199-005														
6029	0-5	1.92	5.0	7.5	1.2	0.1	0.1	0.1	---	9.0	83	1	11	0.84
6030	5-16	0.60	4.7	3.7	0.8	0.0	0.2	0.5	---	5.2	68	3	10	0.55
6031	16-25	0.43	4.1	4.9	1.2	0.1	0.3	2.2	---	8.7	54	2	25	0.52
6032	25-41	0.28	4.1	10.1	2.4	0.2	1.3	2.4	---	16.4	67	6	15	0.57
6033	41-59	0.19	4.3	12.5	3.0	0.2	2.2	0.6	---	18.5	79	8	3	0.59
6034	59-80	0.15	5.4	15.5	3.6	0.2	3.3	0.1	---	22.7	84	9	0	0.61
Jayhawker (1,4)														
S95TX-199-009														
5010	0-6	0.80	4.7	0.3	0.2	0.0	0.1	1.1	---	1.7	14	2	65	0.88
5011	6-20	0.27	4.6	0.1	0.1	0.0	0.1	1.5	---	1.8	8	3	83	0.69
5012	20-36	0.14	4.4	0.1	0.1	0.1	0.1	1.8	---	2.2	11	3	82	0.83
5013	36-69	0.15	4.3	0.1	0.1	0.1	0.1	3.4	---	3.8	8	2	89	0.60
5014	69-80	0.05	4.8	0.2	0.3	0.1	0.2	2.2	---	3.0	19	5	73	0.64
Kirbyville (1,4)														
S96TX-199-001														
6000	0-5	1.36	4.3	1.1	0.4	0.0	0.1	0.9	---	2.5	22	1	36	1.36
6001	5-11	0.37	4.4	0.6	0.2	0.0	0.1	1.0	---	1.9	20	2	53	0.51
6002	11-18	0.19	4.5	0.8	0.5	0.0	0.1	1.6	---	3.0	26	2	53	0.35
6003	18-25	0.15	4.6	0.8	0.7	0.0	0.1	2.4	---	4.0	23	1	60	0.32
6004	25-33	0.14	4.6	0.6	0.7	0.0	0.1	2.2	---	3.6	22	2	61	0.31
6005	33-60	0.07	4.6	0.5	0.7	0.0	0.1	2.0	---	3.3	21	2	61	0.29
6006	60-80	0.06	4.4	0.5	1.2	0.0	0.1	3.6	---	5.4	21	1	67	0.27

See footnotes at end of table

Table 20.--Chemical Analyses of Selected Soils--Continued

(Dashes indicate that analyses were not made)

Soil name and sample number	Depth	Organic carbon	pH 1:1 (soil: water)	Extractable bases					Total Acid- ity	Cation Exchange capacity (effect- ive)	Base satura- tion (sum)	Exchange- able sodium (ESP)	Aluminum saturation	Ratio CEC to Clay
				Ca	Mg	K	Na	Al						
	In	Pct	pH	------------------ Meq/100gm -------------							Pct	Pct	Pct	
Kountze (1,4)														
S96TX-199-002														
6007	0-6	1.49	5.3	1.8	0.4	0.1	0.1	0.0	---	2.4	44	2	0	1.69
6008	6-17	0.26	4.9	0.5	0.4	0.0	0.1	0.1	---	1.1	29	3	9	0.83
6009	17-25	0.11	4.8	0.6	0.5	0.0	0.1	0.2	---	1.4	31	3	14	0.59
6010	25-43	0.13	4.8	1.2	0.7	0.0	0.1	0.4	---	2.4	48	2	17	0.45
6011	43-54	0.11	4.7	1.3	1.1	0.0	0.1	0.5	---	3.0	51	2	17	0.37
6012	54-73	0.07	4.2	0.6	0.7	0.0	0.1	1.2	---	2.6	31	2	46	0.39
6013	73-80	0.05	4.3	0.5	0.6	0.0	0.1	1.7	---	2.9	28	2	59	0.41
McNeely (2,4)														
S94TX-199-001														
95P985S	0-5	0.97	4.5	1.0	TR	TR	0.2	0.4	3.7	1.6	34	---	25	1.35
95P986S	5-22	0.29	5.1	0.2	---	---	0.2	0.2	1.0	0.6	29	---	33	0.70
95P987S	22-37	0.09	5.3	TR	---	---	0.2	0.1	0.5	0.3	40	---	33	0.28
95P988S	37-45	0.06	5.2	TR	---	TR	0.1	0.1	0.3	0.2	33	---	50	0.15
95P989S	45-72	---	5.2	TR	---	TR	0.2	0.1	0.7	0.3	100	---	33	0.04
95P990S	72-80	0.02	5.2	0.1	---	---	0.2	0.1	1.0	0.4	50	---	25	0.19
Nona (1,4)														
S96TX-199-008														
6049	0-3	0.53	4.4	0.4	0.2	0.0	0.2	0.7	---	1.5	21	5	47	1.39
6050	3-7	0.25	4.5	0.4	0.2	0.0	0.1	0.7	---	1.4	23	3	50	0.97
6051	7-19	0.16	4.9	0.5	0.2	0.0	0.2	0.7	---	1.7	32	6	41	0.86
6052	19-38	0.20	4.9	1.5	1.6	0.1	0.4	2.5	---	6.1	36	4	41	0.48
6053	38-53	0.16	4.7	3.2	3.3	0.2	0.7	3.4	---	10.8	49	5	31	0.44
6054	53-72	0.09	4.6	3.6	3.6	0.2	1.0	1.8	---	10.2	60	7	18	0.56
6055	72-80	0.06	4.3	5.7	7.5	0.4	1.6	1.7	---	16.9	70	7	10	0.60
Plank (2,4)														
S94TX-199-005														
95P1015S	0-3	1.75	4.1	0.5	0.1	TR	---	1.7	---	2.3	9	---	74	1.37
95P1016S	3-24	0.16	4.6	TR	TR	---	0.10	0.9	---	1.0	5	---	90	0.56
95P1017S	24-35	0.06	4.8	0.1	TR	TR	---	1.6	---	1.7	3	---	94	0.49
95P1018S	35-65	0.07	5.1	0.5	0.4	TR	TR	1.9	---	2.8	20	---	68	0.53
95P1019S	65-80	0.01	5.1	0.7	0.7	TR	0.30	0.9	---	2.6	46	---	35	0.54
D0491*	96-108	0.08	4.3	4.4	5.5	0.3	3.0	1.0	---	14.2	81	19	7	---
D0492*	144-180	0.06	4.9	12.2	11.0	0.8	4.5	0.3	---	28.8	81	13	1	---
Silsbee (1,4)														
4982	0-5	0.99	4.5	0.2	0.2	0.1	0.1	1.0	---	1.6	15	3	63	4.00
4983	5-15	0.42	4.9	0.3	0.2	0.1	0.1	0.5	---	1.2	25	4	42	1.40
4984	15-30	0.22	5.3	1.9	1.0	0.1	0.1	0.9	---	4.0	45	1	23	0.26
4985	30-49	0.09	5.2	1.1	0.9	0.1	0.1	1.4	---	3.6	35	2	39	0.23
4986	49-58	0.08	5.1	1.0	0.8	0.1	0.1	1.9	---	3.9	31	2	49	0.24
4987	58-71	0.06	5.1	0.8	0.7	0.1	0.1	1.3	---	3.0	29	2	43	0.24
4988	71-80	0.07	5.1	0.8	0.8	0.0	0.1	1.2	---	2.9	28	2	41	0.27

See footnotes at end of table

Table 20.--Chemical Analyses of Selected Soils--Continued
(Dashes indicate that analyses were not made)

Soil name and sample number	Depth	Organic carbon	pH 1:1 (soil: water)	Extractable bases Ca	Mg	K	Na	Al	Total Acid- ity	Cation Exchange capacity (effect- ive)	Base satura- tion (sum)	Exchange- able sodium (ESP)	Aluminum saturation	Ratio CEC to Clay
	In	Pct	pH	Meq/100gm							Pct	Pct	Pct	
Sorter (1,4)														
95TX-199-008														
5003	0-3	2.47	4.0	1.1	0.4	0.0	0.3	1.2	---	3.0	20	3	40	4.05
5004	3-24	0.24	4.6	1.1	0.5	0.0	0.4	0.4	---	2.4	53	11	17	1.06
5005	24-41	0.13	4.6	1.4	0.5	0.0	0.5	0.4	---	2.8	65	14	14	0.84
5006	41-51	0.81	4.7	1.2	0.6	0.1	0.4	0.1	---	2.4	62	11	4	0.90
5007	51-78	0.07	4.8	1.5	0.5	0.0	0.5	0.3	---	2.8	64	13	11	0.76
5008	78-80	0.05	5.1	1.4	0.6	0.0	0.4	0.3	---	2.7	67	11	11	0.78
5009	144-156	0.04	5.3	18.5	5.5	0.4	2.9	0.1	---	27.4	99	10	0	0.63
Spurger (1,4)														
S96TX-199-003														
6014	0-6	2.08	4.7	1.7	0.6	0.1	0.1	0.6	---	3.1	27	1	19	1.37
6015	6-11	0.44	4.6	0.8	0.4	0.0	0.1	0.9	---	2.2	27	2	41	0.53
6016	11-25	0.50	4.2	0.5	3.7	0.3	0.3	14.6	---	19.4	17	1	75	0.50
6017	25-37	0.38	4.2	0.2	5.9	0.3	0.4	16.9	---	23.7	21	1	71	0.52
6018	37-50	0.31	4.1	0.2	5.8	0.3	0.5	14.4	---	21.2	23	2	68	0.53
6019	50-58	0.26	4.2	0.1	4.8	0.3	0.5	10.6	---	16.3	23	2	65	0.52
6020	58-74	0.19	4.3	0.2	5.4	0.2	0.3	8.5	---	14.6	39	2	58	0.52
6021	74-80	0.08	4.6	0.1	1.4	0.1	0.2	3.1	---	4.9	30	3	63	0.52
Texla (1,3)														
S94TX-199-005														
6022	0-5	2.20	5.8	8.1	1.1	0.1	0.1	0.0	---	---	85	1	0	3.06
6023	5-11	0.46	5.3	2.0	0.5	0.0	0.0	0.1	---	2.6	63	0	4	1.11
6024	11-17	0.17	3.9	0.9	0.4	0.0	0.0	2.8	---	4.1	24	0	68	0.48
6025	17-38	0.13	3.9	0.8	0.8	0.1	0.1	4.9	---	6.7	23	1	73	0.44
6026	38-45	0.12	4.6	2.1	1.6	0.1	0.5	7.7	---	12.0	31	4	65	0.48
6027	45-67	0.13	4.7	5.8	2.5	0.2	1.3	7.3	---	17.1	52	7	43	0.47
6028	67-80	0.08	4.7	8.1	3.4	0.2	1.7	3.3	---	16.7	72	9	20	0.53
Turkey (2,3)														
S94TX-199-002														
95P991S	0-5	1.12	4.8	0.8	0.1	TR	0.2	0.4	5.9	1.5	30	---	27	0.97
95P992S	5-10	0.25	5.4	0.3	TR	TR	0.2	0.2	2.4	0.7	25	---	29	0.48
95P993S	10-20	0.11	5.4	0.3	TR	TR	0.2	0.1	1.5	0.6	38	---	17	0.29
95P994S	20-33	0.07	5.4	---	TR	TR	0.1	TR	0.8	---	40	---	---	0.24
95P995S	33-52	0.05	5.0	0.1	---	TR	0.1	0.2	1.5	0.4	22	---	50	0.20
95P996S	52-80	0.04	5.1	---	---	TR	0.1	0.5	1.8	0.6	9	---	83	0.21

See footnotes at end of table

Table 20.--Chemical Analyses of Selected Soils--Continued

(Dashes indicate that analyses were not made)

Soil name and sample number	Depth	Organic carbon	pH 1:1 (soil: water)	Extractable bases					Total Acid- ity	Cation Exchange capacity (effect- ive)	Base satura- tion (sum)	Exchange- able sodium (ESP)	Aluminum saturation	Ratio CEC to Clay
				Ca	Mg	K	Na	Al						
	In	Pct	pH	------------------ Meq/100gm -------------							Pct	Pct	Pct	
Tyden (2,3)														
S94TX-199-003														
95P997S	0-3	6.33	3.8	0.1	0.1	0.3	0.6	3.0	23.1	4.1	7	---	73	4.33
95P998S	3-13	1.69	3.9	---	---	0.1	0.2	2.2	11.3	2.5	4	---	88	1.84
95P999S	13-19	0.58	4.2	---	---	TR	0.3	2.7	3.9	3.0	8	---	90	1.09
95P1000S	19-28	0.08	4.2	0.1	TR	---	0.1	1.0	1.9	1.2	12	---	83	0.47
95P1001S	28-41	0.06	4.0	0.1	---	---	0.1	1.4	8.7	1.6	9	---	88	0.46
95P1002S	41-58	0.04	4.1	---	0.2	---	0.2	1.6	2.8	2.0	15	---	80	0.47
95P1003S	58-73	0.04	4.4	0.3	0.4	---	0.1	1.3	3.4	2.1	29	---	62	0.42
95P1004S	73-82	0.06	4.1	0.3	0.8	TR	0.1	2.4	4.8	3.6	30	---	67	0.43
95P1005S	82-89	0.08	5.0	1.8	1.9	TR	0.1	0.5	3.3	4.3	72	---	12	0.38
Vamont (1,4)														
S98TX-199-001														
6277	0-4	1.53	4.8	14.8	5.2	0.3	0.2	2.3	---	22.8	62	1	10	0.66
6278	4-7	0.51	4.4	15.5	5.5	0.4	0.4	4.3	---	26.1	66	1	16	0.58
6279	7-20	0.35	4.3	15.3	5.3	0.3	0.3	4.7	---	26.2	63	2	18	0.61
6280	20-34	0.27	4.2	18.2	6.2	0.4	0.4	3.4	---	29.3	79	3	12	0.60
6281	34-47	0.27	4.1	19.0	6.7	0.4	0.4	1.9	---	29.7	82	4	6	0.59
6282	47-60	0.19	4.5	25.1	7.5	0.4	0.4	0.5	---	35.9	100	4	1	0.57
6283	60-76	0.14	5.8	34.6	8.8	0.5	0.5	---	---	36.4	100	5	---	0.56
6284	76-80	0.11	6.5	39.9	11.5	0.6	0.6	---	---	47.8	100	6	---	0.63
Votaw (1,4)														
S95TX-199-004														
4974	0-4	0.99	5.0	0.4	0.1	0.1	0.1	0.6	---	1.3	19	3	46	3.70
4975	4-9	0.38	5.2	0.1	0.1	0.0	0.2	0.3	---	0.7	17	9	43	1.44
4976	9-15	0.26	5.4	0.1	0.1	0.0	0.3	0.1	---	0.6	29	18	17	1.89
4977	15-25	0.13	5.6	0.3	0.1	0.0	0.1	0.0	---	1.5	33	7	0	1.88
4978	25-29	0.10	5.7	0.3	0.1	0.0	0.1	0.0	---	1.2	42	8	0	1.33
4879	29-47	0.04	5.6	0.1	0.0	0.0	0.0	0.0	---	1.0	10	0	0	1.43
4980	47-63	0.09	5.4	0.0	0.0	0.0	0.1	0.1	---	1.4	7	7	50	2.00
4981	63-80	0.03	5.3	0.0	0.0	0.0	0.1	0.1	---	0.9	11	11	50	3.00

1 Soil Characterization Laboratory, Texas A&M University, College Station, Texas.

2 National Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska.

3 Type Location for series.

4 Typifying pedon for Hardin County, Texas.

Table 21.--Classification of the Soils

Soil name	Family or higher taxonomic class
Anahuac	Fine, mixed, active, hyperthermic Oxyaquic Glossudalfs
Angelina	Fine-loamy, siliceous, active, acid, thermic Typic Fluvaquents
Aris	Fine, smectitic, hyperthermic Typic Glossaqualfs
Babco	Coarse-loamy, siliceous, semiactive, thermic Oxyaquic Alorthods
Batson	Fine-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs
Beaumont	Fine, smectitic, hyperthermic Chromic Dystraquerts
Belrose	Coarse-loamy, siliceous, superactive, thermic Oxyaquic Paleudults
Bevil	Fine, smectitic, thermic Chromic Dystraquerts
Bleakwood	Fine-loamy, siliceous, active, acid, thermic Typic Endoaquepts
Camptown	Fine-silty, siliceous, active, thermic Typic Glossaqualfs
Caneyhead	Fine-silty, siliceous, active, thermic Typic Glossaqualfs
Cypress	Fine, mixed, superactive, acid, thermic Typic Fluvaquents
Dallardsville	Coarse-loamy, siliceous, semiactive, thermic Oxyaquic Paleudults
Estes	Fine, smectitic, thermic Aeric Dystraquerts
Evadale	Fine, smectitic, thermic Typic Glossaqualfs
Gist	Coarse-silty, siliceous, superactive, thermic Oxyaquic Glossudalfs
Iulus	Coarse-loamy, siliceous, active, thermic Fluvaquentic Dystrudepts
Jasco	Coarse-silty, siliceous, semiactive, thermic Vermic Fragiaqualfs
Jayhawker	Coarse-silty, siliceous, active, thermic Typic Paleaquults
Kenefick	Fine-loamy, siliceous, active, thermic Ultic Hapludalfs
Kirbyville	Fine-loamy, siliceous, semiactive, thermic Oxyaquic Paleudults
Kountze	Coarse-loamy, siliceous, active, thermic Oxyaquic Paleudults
Labelle	Fine, smectitic, hyperthermic Oxyaquic Vertic Argiudolls
League	Fine, smectitic, hyperthermic Oxyaquic Dystruderts
Lelavale	Fine-loamy, siliceous, semiactive, thermic Typic Glossaqualfs
Leton	Fine-silty, siliceous, superactive, hyperthermic Typic Glossaqualfs
Levac	Fine, smectitic, hyperthermic Oxyaquic Vertic Hapludalfs
Manco	Fine-silty, siliceous, active, acid, thermic Fluvaquentic Endoaquepts
McNeely	Thermic, coated Typic Quartzipsamments
Niwana	Coarse-loamy, siliceous, semiactive, thermic Typic Paleudults
Nona	Fine-silty, siliceous, active, thermic Natric Vermaqualfs
Olive	Coarse-loamy, siliceous, superactive, thermic Umbric Fragiaquults
Otanya	Fine-loamy, siliceous, semiactive, thermic Plinthic Paleudults
Plank	Coarse-silty, siliceous, active, thermic Natric Vermaqualfs
Silsbee	Fine-loamy, siliceous, semiactive, thermic Typic Paleudults
Sorter	Coarse-loamy, siliceous, superactive, thermic Natric Vermaqualfs
Spindletop	Fine, smectitic, hyperthermic Oxyaquic Argiudolls
Spurger	Fine, smectitic, thermic Albaquultic Hapludalfs
Texla	Fine-silty, siliceous, active, thermic Oxyaquic Glossudalfs
Turkey	Thermic, coated Typic Quartzipsamments
Tyden	Coarse-loamy, siliceous, active, thermic Umbric Paleaquults
Vamont	Fine, smectitic, thermic Oxyaquic Hapluderts
Votaw	Thermic, coated Oxyaquic Quartzipsamments
Waller	Fine-loamy, siliceous, active, thermic Typic Glossaqualfs

NRCS Accessibility Statement

The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at helpdesk@helpdesk.itc.nrcs.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.